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個人參與台灣衍生性商品市場之性別分析(V02.V04)

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中 文 摘 要 ： 本研究探討民眾具備較高的金融知識是否比較積極參與衍生性金融商品市場。問卷實證結果顯示具備進階金融知識的民眾比較可能會參與衍生性商品市場，而具備基礎金融知識的民眾與參與衍生性金融商品市場成反向關係，這結果恰巧與文獻上的股票市場參與結果相反。影響民眾參與衍生性金融商品市場比較相關的知識領域分別是信貸與投資方面，此外，知識來源越分散，民眾參與衍生性金融商品市場的能性就越高。

中 文 關 鍵 詞 ： 家庭金融; 衍生性商品市場參與;

英 文 摘 要 ： This study investigates whether individuals with higher levels of financial literacy are more likely to be active participants in the derivatives markets. Empirical results, based upon a National Survey of the official Financial Supervisory Commission of Taiwan, show that advanced financial literacy helps individuals to lower the entry barriers to complex derivatives products, whilst the negative correlation found between basic financial literacy and derivatives market participation runs contrary to the relationship between basic financial literacy and stock market participation. The primary areas of specific knowledge in derivatives products are ‘credit and loan management’ and ‘financial and investment planning’, with greater diversity in the sources of information on financial literacy ultimately contributing to higher participation in the derivatives markets.

英 文 關 鍵 詞 ： Household finance; Derivatives market participation.

Financial Literacy and Participation in the Derivatives Markets

ABSTRACT

This study investigates whether individuals with higher levels of financial literacy are more likely to be active participants in the derivatives markets. Empirical results, based upon a National Survey of the official Financial Supervisory Commission of Taiwan, show that advanced financial literacy helps individuals to lower the entry barriers to complex derivatives products, whilst the negative correlation found between basic financial literacy and derivatives market participation runs contrary to the relationship between basic financial literacy and stock market participation. The primary areas of specific knowledge in derivatives products are 'credit and loan management' and 'financial and investment planning', with greater diversity in the sources of information on financial literacy ultimately contributing to higher participation in the derivatives markets.

Keywords: Household finance; Financial literacy; Derivatives market participation.

JEL Classification: D8, E2, G1

1. INTRODUCTION

As compared to the wealth of studies within the extant literature on stock market participation,[1] considerably less focus has been placed on the determinants of household participation in complex derivatives markets, which are almost never redundant assets for individuals.[2] The main research question pursued in this study is an important topic for policymakers and government officials alike, since an increase in the use of derivatives transactions among individuals for hedging purposes will lead to a corresponding increase in social welfare (Stout, 2011).

Another important benefit of derivatives markets to an economy is that these markets incorporate information into asset prices much more quickly and efficiently; for instance, when it is difficult to engage in the short selling of stocks, individuals can choose to purchase put options in order to take advantage of adverse information relating to stock prices, ultimately leading to the markets becoming more efficient and preventing a slowdown in the speed of information transmission.[3] In other

[1] See Mankiw and Zeldes (1991), Blume and Zeldes (1994), Haliassos and Bertaut (1995), Bertaut and Starr (2000), Brav, Constantinides and Geczy (2002), Vissing-Jorgensen (2003), Attanasio, Banks and Tanner (2002), Guiso, Sapienza and Zingales (2008) and Bricker, Bucks, Kennickell and Moore (2011).

[2] Stulz (2004) noted that individual investors are faced with higher transaction costs than most financial institutions, leading to the expensive replication of the payoff of a derivative, even if they simply manufacture a vanilla option.

[3] Theoretically, if it is difficult to take up short positions in stocks, then the issuer/seller of a put option (typically a large securities firm) would quote prices reflecting this difficulty, essentially because this firm may have to hedge its options exposure; thus, given the difficulty in shorting the underlying share, the put option may not be so "cheap" for the buyer.

words, with a better understanding of the determinants of participation by individuals in derivatives trading, we may be able to identify the necessary policy recommendations for promoting improved informational efficiency in the market and enhancing social welfare.

Given the importance of having a good understanding of participation by individuals in the derivatives markets, our aim in this study is to contribute to the extant literature by investigating whether the financial literacy possessed by individuals plays a key role in their participation in the derivatives markets. Since general consumers are presumed to have quite limited knowledge and ability to invest in complex derivatives products, which can be viewed as an indirect participation cost, this is a factor potentially explaining their non-participation in such markets. We therefore hypothesize that financial literacy helps to lower entry barriers, thereby enabling individuals to more readily participate in complex derivatives markets.

There has been a distinct lack of research effort placed into the relationship between financial literacy and trading by individuals in leveraged derivatives products. Complex derivatives products create high entry barriers, such that individuals with less financial literacy will find it difficult to participate in, and benefit from, the use of derivatives for the purpose of hedging their financial risks;

for instance, individuals with lower levels of financial literacy are less likely to use VIX derivatives (such as VIX futures and VIX options)[4] as a hedging instrument against market volatility.[5] Taking put options as another example, in cases where it is difficult to engage in the short selling of stocks, individuals with lower levels of financial literacy are less likely to possess knowledge on the use of put options as a means of realizing public information on poor firm performance.

We therefore use a unique sample dataset obtained from a nationwide survey carried out by the Financial Supervisory Commission of Taiwan (FSC)[6] to construct a measure of financial literacy, and then go on to test whether individuals with higher levels of financial literacy tend to participate more actively in the derivatives markets than individuals with lower financial literacy levels. In other words, given that financial literacy can be viewed as a type of indirect cost for participating in derivatives trading, we investigate whether improving the financial literacy levels of individuals can enhances such participation.

Referring to Van Rooij, Lusardi and Alessie (2011) and Shen, Lin, Tang and Hsiao (2016), our survey included an extensive list of questions on demographic

[4] The underlying asset of VIX derivatives is the CBOE volatility index (VIX), also referred to as the 'investor fear gauge'. The CBOE VIX is compiled using the market prices of S&P 500 index options, with the primary aim of providing the market with a measure of expected volatility in the S&P 500 index over the subsequent 30-day period.

[5] Although it is also possible to trade volatility using options trading strategies, such as straddles and strangles, these strategies are not pure instruments of volatility trading since their profits/losses are affected by changes in both volatility and the underlying asset price.

[6] This organisation is similar to the Securities and Exchange Commission (SEC) in the US.

characteristics and wealth holdings to assess basic and advanced levels of financial literacy among individuals, from which we constructed an index based upon factor analysis. Controls were put in place for the age, gender, marital status, educational background, residential location, employment status and annual income of the individuals. The regression results reveal a significant and increasing relationship between advanced financial literacy and derivatives market participation, whereas a negative correlation is discernible between basic financial literacy and such participation. These results provide support for the argument that complex derivatives products impose high entry barriers for individuals, with such individuals requiring relatively high financial literacy levels in order to overcome these barriers and participate in the derivatives markets.

We further divided the financial literacy index into four sub-categories comprising of 'cash management and savings', 'credit and loan management', 'financial and investment planning' and 'insurance and risk prevention' in an attempt to gain a better understanding of those aspects of financial literacy that are potentially related to derivatives participation. Our empirical results reveal positive correlations with derivatives market participation for both 'credit and loan management' and 'financial and investment planning'; thus, policymakers and government officials should note that increasing financial education relating to credit and investments

would make individuals more familiar with complex derivatives products.

The comprehensive survey dataset adopted for this study also enables us to assess whether more diverse channels of information can result in higher participation rates in the derivatives markets. We constructed an index of diversity channels, comprising of eight information channels with an index range of 0 to 8, and then assigned one point for the availability of each channel. Our empirical results indicate a greater likelihood of individuals with diverse information sources participating in the derivatives markets.

We go on to apply a bivariate probit model in order to examine the impact of financial literacy levels on individuals who are simultaneously faced with two participation choices (stocks and derivatives). The results indicate that higher levels of advanced financial literacy have a positive correlation with participation in both the stock and derivatives markets, whereas quite different results are found for basic financial literacy. In specific terms, although an increase in basic financial literacy increases stock market participation, it actually reduces derivatives market participation, which implies that the use of derivatives is concentrated mainly among individuals with relatively high levels of financial literacy. The major contribution made by this study is that by studying the potential relationship between financial literacy and experience in purchasing derivatives products, we essentially fill a gap

within the extant literature.

A common view is that derivatives provide individuals with instruments for the management of financial risks,[7] whilst individual investors can also achieve payoffs from derivatives which they would be unable to achieve by themselves without some considerable difficulty.[8] In other words, derivatives make the markets more complete, with the end result being that the economy is more productive and social welfare is higher. Our empirical results show that individuals with higher levels of financial literacy are more likely to enjoy the benefits of derivatives usage.

The remainder of this paper is organized as follows. A review of the related literature is provided in Section 2, followed in Section 3 by a description of the survey dataset, along with an introduction to the empirical methodology adopted for this study. The empirical results, and subsequent checks for their robustness, are presented in Section 4. Finally, the conclusions drawn from this study are presented in Section 5.

2. LITERATURE REVIEW

Given that the lack of participation by individuals in the stock markets has been

[7] Development of the Black-Scholes (1973) formula has changed derivatives trading over the past four decades, such that the derivatives markets have experienced exponential growth, both in the number of underlying assets and in their trading volume.

[8] Even if individuals could manage to achieve payoffs from derivatives, they would be achieved at a much greater cost.

shown to impose significant welfare losses on an economy,[9] numerous attempts have been made in the prior related studies to determine why it is that, even when considering indirect investments, only small numbers of individuals are found to actively participate in stock market trading.[10] For example, using US survey data on consumer finances, Haliassos and Bertaut (1995) found that the most convincing explanations for non-participation were inertia and the departure from expected-utility maximization, whereas Vissing- Jørgensen (2004) noted that information and transaction costs should be considered as explanatory factors in the phenomenon of low participation rates among US households.[11]

Guiso and Jappelli (2005) proposed that the lack of awareness of financial assets provided a feasible explanation for the stockholding puzzle, a proposal which was recently supported by Van Rooij et al. (2011) who demonstrated the important role played by the 'financial literacy' of individuals in their stock market participation. Financial literacy, which is defined as "the ability to use knowledge and skills to manage financial resources effectively for lifetime financial security",[12]

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[9] See for example Cocco, Gomes and Maenhout (2005).

[10] The participation rates in the stock market by individuals are lower than the expected participation rates predicted by the traditional asset pricing models, such as the 'consumption capital asset pricing model'; indeed, several studies have shown that less than a quarter of US households own or invest in individual company shares; see Crockett and Friend (1963), Blume, Crockett and Friend (1974), Blume and Friend (1978), King and Leape (1987), Mankiw and Zeldes (1991) and Haliassos and Bertaut (1995).

[11] Mankiw and Zeldes (1991) and Heaton and Lucas (2000) argued that such fixed costs were of no help in explaining the non-participation rate among the wealthy.

[12] The definition of financial literacy is provided by the US Financial Literacy and Education Commission (2007). Altman (2012) similarly argued that financial literacy referred to a set of knowledge and skills that enable an individual to make effective financial decisions.

has attracted considerable interest among policymakers, recently resulting in some interesting research outcomes in the field of household finance, with one strand of the literature emphasizing the important role of financial literacy in investment decision-making among individuals.

Campbell (2006), for example, found that as compared to better-educated households, there was an increased likelihood of lesser-educated households making serious investment mistakes, whilst Hilgert, Hogarth and Beverly (2003) found that higher financial literacy scores were generally associated with diversified investment portfolios and timely payment of debts. Among the numerous research studies into the phenomenon of low stock market participation,[13] the empirical findings of Van Rooij et al. (2011) demonstrated that individuals with lower levels of financial literacy were more likely to shy away from stock markets, once again indicating that financial literacy helps to lower entry barriers, making it easier for individuals to participate in stock market investment.

Motivated by the importance of financial literacy in the field of household finance, our aim in this study is to extend the related literature by taking the financial literacy levels of individuals as one of the major factors determining their

[13] See, for example, Mankiw and Zeldes (1991), Blume and Zeldes (1994), Haliassos and Bertaut (1995), Bertaut and Starr (2000), Brav, Constantinides and Geczy (2002), Vissing-Jorgensen (2002), Attanasio, Banks and Tanner (2002), Guiso, Sapienza and Zingales (2008) and Bricker, Bucks, Kennickell and Moore (2011).

participation in the complex derivatives markets. An important element of this study is our exploration of the ways in which differences in the financial literacy of individuals affect their investment decision making when they are considering making purchases of derivative instruments

Numerous studies have undertaken examinations into the relationship between financial literacy and the investment behavior of individuals.[14] As argued by Stout (2011), it would be of significant benefit to social welfare if individuals could correctly invest their money in derivatives products, such as entering into a derivatives contract for hedging purposes. Furthermore, given the growth in trading volume in the derivatives markets over the past three decades, Roll, Schwartz and Subrahmanyam (2009) also noted that the listing of options provides individuals with more channels to provide them with an understanding of the state of the economy, which can then enable them to realize such information in the options markets where the transaction costs are lower.

Given that the market mechanism in the derivatives markets leads to more efficient prices, such increases in price efficiency will ultimately give rise to the more efficient allocation of corporate resources, which will also lead to more precise

[14] Examples include Hilgert, Hogarth and Beverly (2003), Lusardi and Tufano (2009), Sallie Mae (2009), Van Rooij, Lusardi and Alessie (2011), Behrman, Jere, Mitchell, Soo and Bravo (2012), Disney and Gathergood (2013) and Mottola (2013).

firm valuations.[15] The benefits of the derivatives markets are therefore worthy of in-depth investigation, with particular focus on exactly who participates in trading in the derivatives markets, as well as the characteristics of these participants. To the best of our knowledge, no analysis has yet been undertaken within the extant literature on the relationship between financial literacy and participation by individuals in the derivatives markets.

As already noted, complex derivatives products, which are almost never redundant assets for individual investors, create high entry barriers, such that individuals with lower levels of financial literacy will invariably find it difficult to participate in, and benefit from, the use of derivatives as a means of hedging their financial risks; thus, the limited ability of inexperienced consumers to invest in complex derivatives products, which can be viewed as an indirect participation cost, provides a feasible explanation for their non-participation. We therefore hypothesize that advanced financial literacy will help individuals to overcome these entry barriers, making it easier for them to participate in the complex derivatives markets. Two hypotheses are therefore proposed in this study, as follows:

Hypothesis 1: *Basic financial literacy reduces participation by individuals in the derivatives markets.*

[15] See, for example, Fishman and Hagerty (1992), Khanna, Slezak and Bradley (1994), Dow and Gorton (1997) and Subrahmanyam and Titman (1999).

Hypothesis 2: *Advanced financial literacy increases participation by individuals in the derivatives markets.*

3. DATA DESCRIPTION

3.1 Collection of the Respondent Sample

Our data sample was obtained from the Literacy Survey undertaken in 2011 by the Financial Supervisory Commission (FSC) of Taiwan.[16] The survey was carried out based upon nationwide proportionate stratified sampling. The FSC constructed the reference population using a 2010 demographic report on 22 cities and counties in Taiwan – issued by the Department of Statistics at the Ministry of the Interior – along with census data on the age, gender and educational background of the Taiwanese population.

The allocation of the samples gathered from each of the cities and counties was based upon a population ratio which was relative to the entire nation, with the samples in each stratum being determined by the relative ratios of age, gender and educational background. The samples adopted for this survey therefore reflect the characteristics of age, gender and educational background in each city and county.[17] The one major exclusion criteria was that the respondents were required to be at

[16] The Financial Supervisory Commission is an independent government agency, subordinate to the Executive Yuan of Taiwan, which is responsible for maintaining stability in Taiwan's financial markets and regulating accounting, securities and futures, banking and insurance.

[17] These samples use the annual income distribution in Taiwan issued by the Directorate-General of Budget, Accounting and Statistics as a reference, to fit the samples into the Taiwanese population characteristics distribution.

least 20 years of age, which ultimately provided us with a total of 2,523 effective samples for subsequent analysis.

Financial literacy, which is defined within the Literacy Survey as "finance-related activities in daily life", was divided into nine indicators according to the questions contained within the questionnaire; these nine indicators are 'cash management', 'savings', 'credit management', 'financial planning', 'insurance and risk prevention', 'debt management', 'pension planning', 'investment management' and 'financial information'. The respondents were surveyed primarily by means of interviews so as to increase both the recovery rate and the accuracy of the survey, with only a few respondents answering the questionnaire by mail.

3.2 Variables

All of the participants received the following general description of a derivatives contract, and were then asked a question from the national literacy survey as the measure of whether individuals had ever purchased derivatives products:

"A financial derivative is a contract in which one party promises to make a payment to another party in the future, where the amount to be paid is based on the value of something else (*known as the underlying asset*) *at the time. The underlying asset of a derivative contract can be one or more of the following instruments: equity* (*stocks*), *index*, *interest rate*, *commodity or foreign exchange*".

After reading this description, they were asked to answer the following question to facilitate the construction of a dummy variable for derivatives market participation:

"Have you ever bought derivatives products such as swaps, *futures*, *forwards*, *options* (*put*, *call*, *cap*, *floor or exotic options*), *warrants*, *credit default swaps* (*CDS*), *collateralized debt obligation* (*CDO*) *or leveraged ETFs?*"

We refer to van Rooij et al. (2011) and Shen et al. (2016) for our introduction of the measures of financial literacy; we follow these studies to evaluate financial literacy using two modules, although a few of the questions on financial literacy are unique in the second module in our study. The first set of questions, which aims to assess basic financial literacy, covers basic topics under the four categories of 'money management and savings', 'credit and loan management', 'financial and investment planning' and 'insurance and pension planning',[18] whilst the second set of questions, involving the same four categories, aims to measure advanced financial knowledge.[19]

We began by constructing a financial literacy index based upon these two sets of questions and then carried out a preliminary factor analysis using all 37 questions in the financial literacy modules. Consistent with the way that the questions had been devised, the preliminary factor analysis suggested that there were two main

[18] The exact wording of the questions measuring basic financial literacy is provided in Appendix A.
[19] To facilitate the classification of the respondents according to their different levels of financial sophistication, several additional questions were added to the module; the exact wording of these questions is provided in Appendix B.

factors with different loadings on the two types of questions, the basic literacy questions (18 questions) and the advanced literacy questions (19 questions).

The questions were then further split into two sub-groups, with separate factor analyses again being carried out on the two sets. This resulted in the construction of two literacy indices, with the first index relating to presumed basic knowledge, and the second index measuring advanced financial knowledge. Details of the factor analyses on our two sets of questions are reported in Appendix C. For clarity, definitions of the dependent and independent variables examined in this study are provided in Table 1.

<Table 1 is inserted about here>

3.3 Sample Characteristics

The basic demographic characteristics of all of the survey respondents are shown in Table 2. The table shows the breakdown by age, gender, marital status, educational background, residential location, employment status and annual income; as noted earlier, the total number of respondents was 2,523. The sample is generally found to be quite diverse in all dimensions, although full-time employment, urban areas and females seem to have relatively higher percentages in the final effective samples.

<Table 2 is inserted about here>

We also provide basic characteristics in Table 3 on the survey respondents who

had purchased derivatives products, from which several points worthy of mention are noted. First of all, the highest percentages were consistently found in the high literacy groups, regardless of whether this was basic or advanced financial literacy; taking advanced financial literacy as an example, the percentage of those respondents equipped with a high (low) level of advanced financial literacy was 56.10 per cent (19.51 per cent). Secondly, it is also clear from Table 3 that people aged 30-39 years were more likely to have some experience in the purchase of derivatives products (46.67 per cent).

<Table 3 is inserted about here>

Thirdly, the percentage of people with some experience in participation in the derivative markets was much lower for females (35.56 per cent) than males (64.44 per cent), which is consistent with the survey results on stock market participation reported by van Rooij et al. (2011). Finally, respondents who were unmarried, living in urban areas and on lower salaries were all found to be associated with a reduced probability of experience in derivatives purchases.

4. EMPIRICAL ANALYSIS

4.1 Main Results

We first of all carried out logistic regression analyses to examine the association between the financial literacy of the respondents and their experience in derivatives

product purchases. The logistic regression model is specified as follows.

$$P(D_{DMP} = 1) = F(\beta' X), \quad (1)$$

where D_{DMP} denotes a dummy variable which takes the value of 1 if a respondent had purchased derivatives products, otherwise 0; $\boldsymbol{F}(\cdot)$ is the cumulative probability density function of the logistic distribution; β is the vector of the coefficients; and X is the vector of explanatory variables, which includes the financial literacy and sociodemographic controls (age, gender, marital status, educational background, residential location, employment status and average annual personal income).

The logistic regression results are presented in Table 4 under three different specifications comprising of Model (1), which included our measure of basic financial literacy, Model (2), which included our measure of advanced financial literacy, and Model (3), which included both the basic and advanced financial literacy measures.

<Table 4 is inserted about here>

The coefficient on basic financial literacy in Model 1 is found to be insignificantly negative, and as we can see from Model (2), those respondents with higher levels of advanced financial literacy were found to be more likely to participate in the derivatives markets; however, in Model (3), after accounting for advanced financial literacy, the estimate of basic financial literacy becomes statistically significant at

the 1 per cent level, thereby suggesting that those respondents with higher levels of basic financial literacy were less likely to participate in the derivatives market.

A notable result is that basic financial literacy is found to have a significantly negative effect, which suggests that people with higher levels of basic financial literacy are less likely to participate in the derivatives markets, and indeed, the estimates are found to be sizable; that is to say, with an increase in the level of basic financial literacy by one unit, the probability of derivatives market participation is reduced by 39.8 per cent.[20] Conversely, a single-unit increase in the level of advanced financial literacy leads to a 106 per cent increase in the probability of derivatives market participation.[21]

Furthermore, the probability of derivatives market participation is found to be higher for males than females. An examination of the odds ratio relating to gender reveals that when a response group comprising of only females is employed as the reference variable, the probability of derivative market participation is found to be 3.539 times higher for males than for females.[22]

4.2 Components of Financial Literacy and Derivatives Market Participation

[20] When the level of financial literacy was increased by one unit, the probability of derivatives market participation was reduced by (0.602 – 1) * 100% = -39.8%.
[21] When the level of financial literacy was increased by one unit, the probability of derivatives market participation was reduced by (2.060 – 1) * 100% =106%.
[22] As the group comprising of female respondents is employed as the reference variable with an odds ratio set as 1, the odds ratio for males vis-à-vis the odds ratio for females is 3.539.

To further investigate the effects of the four components of financial literacy, we establish four sub-variables using an index approach prior to carrying out a logistic regression analysis.[23] The results, which are reported in Table 5, indicate that both the 'credit and loan management' and the 'financial and investment planning' factors have significantly positive influences on derivatives market participation. Thus, it appears that respondents with some knowledge of these topics may choose to trade in options, as opposed to equities, probably as a result of the distinct advantages, which include higher leverage and lower margin.

Conversely, literacy in 'insurance and pension planning' is found to have a significantly negative influence on derivatives market participation, which indicates that people with knowledge of this topic are less likely to participate in the derivatives markets, probably because financially sophisticated consumers can tend to be relatively more risk averse and unlikely to purchase financial products with which they are unfamiliar.

<Table 5 is inserted about here>

4.3 Bivariate Probit Analysis

[23] There are variations in the number of items in each financial literacy category: money management and saving (six questions), credit and loan management (twelve questions), financial and investment planning (eight questions) and insurance and retirement planning (eleven questions). The overall scores for the respondents were calculated according to the answers provided, where a correct answer was assigned a score of 1 and an incorrect answer was assigned a score of 0; for example, as the money management and saving category contained a total of six questions, the highest (lowest) score attainable was 6 (0).

Given that both van Rooij et al. (2011) and Arrondel et al. (2014) documented a positive relationship between stock market participation and financial literacy, we should analyze the effect of financial literacy on derivatives market participation based upon experience in stock market participation among the respondents. In order to achieve this, we modify the previous baseline regression model to use a bivariate probit model in this section, which is constructed as follows:

$$y_{1i}^{*} = X_{1i} \cdot \alpha_1 + \varepsilon_{1i}, \tag{2}$$

$$y_{2i}^{*} = X_{2i} \cdot \alpha_2 + \varepsilon_{2i}, \tag{3}$$

where y_{1i}^{*} and y_{2i}^{*} are linear functions of the variables affecting the respective probability of stock market participation and derivatives market participation; and the $X_{ji}, j = 1, 2$ are $1 \times k_j$ vectors of the characteristic variables, with the disturbances being assumed to have zero-mean, bivariate normal distribution with unit variance and a correlation coefficient ρ.

The first binary choice variable y_{1i} takes the value of 1 if a respondent has some experience in stock market participation, otherwise 0; that is:

$$y_{1i} = 1, \text{ if experienced in stock market participation } (y_{1i}^{*} > 0), \text{ otherwise 0,} \tag{4}$$

The second binary choice variable y_{2i} takes the value of 1 if a respondent has some experience in derivatives market participation, otherwise 0; that is:

$$y_{2i} = 1, \text{ if experienced in derivatives market participation } (y_{2i}^{*} > 0), \text{ otherwise 0.} \tag{5}$$

Intuitively, the bivariate probit model has two sequential events as the dependent variables, the first of which is a respondent's experience in stock market participation, whilst the second is the probability of such a respondent purchasing derivatives products conditional on their experience in the stock market. The bivariate probit model is also allowed to control for common unobserved factors affecting the decision-making process with regard to both the stock and derivatives markets (Green, 2003).

The results of the bivariate probit model are presented in Table 6, where the correlation parameter (ρ) is found to be statistically significant, thereby indicating the presence of common unobserved factors affecting a person's decision on whether to participate in the stock or derivatives market. Furthermore, the correlation parameters are found to be positive, which indicates that when a respondent indicates participation in the stock market, then that respondent is also likely to have participated in the derivatives market, and vice versa.

<Table 6 is inserted about here>

Focusing on the financial literacy regression on stock market participation, both basic financial literacy and advanced financial literacy are found to have significantly positive effects. That is to say, consistent with the findings of van Rooij et al. (2011) and Hsiao, Chen and Liao (2014), those respondents exhibiting higher levels of

overall financial literacy are more likely to participate in the stock market, whilst those with higher levels of advanced financial literacy are also more likely to participate in derivatives market; however, those with higher levels of only basic financial literacy are less likely to participate in the derivatives market.

4.4 Effects of Information Sources and Categories

In the rational models of the determinants of investment in financial information, the more often individual investors invest in information, the more likely they are to trade in securities (Barlevy and Veronesi, 1999; Grossman and Stiglitz, 1980).The rationale behind this general conclusion is that investors choose to become informed through the acquisition of information and that the costs involved in acquiring such information is compensated by taking up positions in risky assets. Investors who choose to become informed through information acquisition will either receive more signals or increase the precision of the signals received, and thus, can be expected to trade aggressively.

In this study, we measure the level of information sources by adopting the answer to one specific question in the Literacy Survey, which asks “where does your financial knowledge and information come from?” The eight response choices, based upon a scale ranging from 0 to 8, were: (1) Trade descriptions of financial institutions; (2) Books; (3) Discussions or interpretations by investment analysts on

TV or radio; (4) Newspaper/magazine advertisements and operators related to the TV industry; (5) Internet and mobile phones; (6) Conversations with family members and friends; (7) Display sections of financial business offices; and (8) School curriculum and handouts. The respondents were allowed to select more than one response, and indeed, the more alternatives they selected, the greater the access to information sources they were assumed to have.

As shown in Table 7, the coefficient on the *Information Sources* variable is found to be significantly positive, which suggests that those respondents with access to diverse channels of information were more likely to participate in the derivatives market. In addition, when the *Information Sources* variable was included in the model, the estimates on the basic (advanced) financial literacy index were found to remain significantly negative (positive). Thus, the inclusion of information sources provides support for the results reported in Table 4.

<Table 7 is inserted about here>

There are additional, asset-specific categories of information that investors can employ to help them to finalise their investment decisions; for example, if investors trade in bonds, then they can make use of bond prospectuses (documents which accompany the issuance of bonds). If the assets in question are stocks, then investors can gain access to the annual and quarterly reports of the regulators and shareholders

(primarily, annual financial reports), paying particular attention to the profit and loss statement and the balance sheet.

In order to determine whether asset-specific categories of information influence participation in the derivatives market; we explore the relationship between the asset-specific categories of information and the derivatives market demand. As shown in Table 8, the categories of financial information are significantly related, since those investors with concerns about information relating to changes in the stock market and taxation are much more likely to invest in derivatives.

<Table 8 is inserted about here>

4.5 National Financial Literacy Survey Data

In order to test the reliability and validity of our empirical results, and to verify the random selection of the samples, we integrated the survey data obtained from the 2007, 2009 and 2011 National Financial Literacy Survey and targeted respondents aged 20 or older to analyze the effects of financial literacy on their derivatives participation. This provided a total of 6,570 samples. However, since the survey questions varied over the three years, we could only select those questions that were identical in all three surveys to redevelop the indices of financial literacy prior to carrying out the logit and probit regression analysis; these were Questions 4, 11, 13, 14, 15, 16, 17, 20,

22 and 30, all covering the basic topics (see Appendix A for full details).[24]

It is clear from Table 9 that male individuals are more likely to participate in derivatives markets, relative to females; furthermore, financial literacy demonstrates a significantly negative influence on participation in the derivatives market, thereby providing further support for the findings reported in Table 4.

<Table 9 is inserted about here>

5. CONCLUSIONS

We set out in this study, utilizing a National Survey carried out by the Financial Supervisory Commission of Taiwan, to investigate participation in the derivatives market at the end of 2011 as a function of the financial literacy of individuals. Our empirical results reveal that individual investors with a basic (advanced) level of financial literacy are less (more) likely to purchase derivatives products.

The impact of financial literacy on derivatives market participation generates different patterns for stock market participation because both the basic and advanced financial literacy of individuals increase the participation rate in the stock markets. This may be related to the characteristics of high-risk complex products. As compared to stocks, individuals have to be equipped with higher levels of financial

[24] The scores for each respondent were calculated according to the answers that they provided, where a correct answer was scored 1 and an incorrect answer was scored 0; thus, the highest (lowest) attainable score was 10 (0).

literacy in order to overcome the higher entry barriers of derivatives products.

We also find that 'credit and loan management' and 'financial and investment planning' are two aspects of financial literacy which can significantly increase rates of participation in the derivatives markets, whereas literacy in the aspects of 'insurance and pension planning' tends to lead to individuals shying away from derivatives products. Furthermore, more diverse sources of information supporting an individual's financial literacy are more likely to lead to their participation in the derivatives markets.

Our empirical results should help to shed some light on the personality traits and objective attributes of individual investors with regard to derivatives market participation. The results also provide policy implications for policymakers and government officials; for example, as noted by Stout (2011), since the speculative behaviour of individual investors will tend to harm social welfare, policymakers can offer appropriate training and provide clear and correct financial knowledge to specific groups of individuals who may be potential purchasers of derivatives products in order to restrain such speculative behaviour.

As regards future research, we suggest that it would be worth analyzing the realized investment performance of participants in the derivatives market, since this could equip us with a much deeper understanding of the motives behind the trading

of individuals, such as entertainment (Dorn and Sengmueller, 2007), gambling (Kumar, 2009) or sensation-seeking (Grinblatt and Keloharju, 2009).

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Table 1 Main variable definitions

Variable	Definition
Dependent Variables	
Derivatives Market Participation (D_{DMP})	A measure of whether people participate in the derivatives market based upon a question from the Literacy Survey: "Have you ever bought derivatives products such as swaps, futures, forwards, options (put, call, cap, floor or exotic options), warrants, credit default swaps (CDS), collateralized debt obligation (CDO) or leveraged ETFs?" A dummy variable is included to identify derivatives market participation by the respondents.
Independent Variables	
Basic Financial Literacy	This variable is measured using questions covering the basic topics of money management and savings, credit and loan management, financial/investment planning and insurance/pension planning. The exact wording of the questions is provided in Box 1, whilst the details on the factor analysis are reported in Appendix A.
Advanced Financial Literacy	This variable is measured using questions covering advanced financial knowledge in the topics of money management and savings, credit and loan management, financial/investment planning and insurance/pension planning. The exact wording of the questions is provided in Box 2, whilst the details on the factor analysis are reported in Appendix A.
Financial Literacy	This variable is measured using questions from the 2007, 2009 and 2011 National Financial Literacy Surveys. Given that the questions varied over the three years, only those questions that were identical in all three questionnaires were selected for the development of the indices of financial literacy; these were Questions 4, 11, 13, 14, 15, 16, 17, 20, 22 and 30, all of which cover the basic topics (see Appendix A for details). The respondent scores were calculated according to the answers provided, with a correct answer receiving a score of 1 and an incorrect answer receiving a score of 0; thus, the highest attainable score was 10 and the lowest was 0.
Information Sources	This variable measures the level of information sources based upon a question from the Literacy Survey: "Where does your financial knowledge and information come from?" The eight possible responses were: (1) Trade descriptions of financial institutions; (2) Books; (3) Discussions or interpretations by investment analysts on TV or radio; (4) Newspaper or magazine advertisements and operators related to the TV industry; (5) Internet and cell phones; (6) Conversations with family members and friends; (7) Display section of financial business office; and (8) School curriculum and handouts. The respondents were allowed to select more than one response; the greater the number of responses selected, the greater their information sources. The scale for this variable ranged from 0 to 8.
Information Categories	This variable measures asset-specific categories of information based upon a question from the Literacy Survey: "Which category of information are you concerned about?" The six possible responses were: (1) Changes in the real estate market; (2) Changes in the stock market; (3) Interest rate levels; (4) Inflation; (5) Taxation; and (6) Information relating to financial products.

Table 2 Basic characteristics of survey respondents ($N = 2{,}523$)[a]

Variables	Details	%
Age	20-29 years	22.59
	30-39 years	30.32
	40-49 years	20.17
	50-59 years	17.04
	60 years or older	9.88
Gender	Male	47.26
	Female	52.74
Education	Junior high school or below	14.74
	Senior high school	25.49
	Vocational School	18.07
	University	30.12
	Graduate school or above	11.58
Marital Status[b]	Unmarried	51.47
	Married	48.53
Profession[c]	Full-time student	7.02
	Full-time employment	64.09
	Domestic homemaker	15.78
	Retired civil servant	5.11
	Other	8.00
Annual Average Personal Income	< NT$ 370,000	29.35
	NT$ 370,000 ≤NT$ 680,000	33.81
	>NT$ 680,000 ≤NT$ 1,240,000	18.79
	>NT$ 1,240,000	18.05
Residential Location	Urban	56.62
	Rural	43.38
Information Sources	Trade descriptions	9.79
	Books	32.86
	Investment analysts	22.55
	Advertisements	55.05
	Internet and mobile phones	29.49
	Family conversations	34.64
	Display section	5.95
	School curriculum	10.07
Information Categories	Changes in the real estate market	46.77
	Changes in the stock market	45.26
	Interest rates	40.43
	Inflation	35.75
	Taxation	19.70
	Relating to financial products	27.23

Notes:

[a] Detailed definitions of the variables are provided in Table 1.

[b] Unmarried respondents includes those who were divorced or cohabitating; married respondents includes those who were separated or widowed.

[c] Other professions includes temporary workers, the unemployed and patients who are unable to work.

Table 3 Basic characteristics of derivatives market participants (N = 387)[a]

Variables	Details	%
Basic Financial Literacy	Low	29.27
	Medium	34.15
	High	36.58
Advanced Financial Literacy	Low	19.51
	Medium	24.39
	High	56.10
Age	20-29 years	20.00
	30-39 years	46.67
	40-49 years	20.00
	50-59 years	13.33
	60 years or older	0.00
Gender	Male	64.44
	Female	35.56
Education	Junior high school or below	13.34
	Senior high school	8.89
	Vocational School	11.11
	University	44.44
	Graduate school or above	22.22
Marital Status[b]	Unmarried	60.00
	Married	40.00
Profession[c]	Full-time student	8.89
	Full-time employment	62.22
	Domestic homemaker	4.44
	Retired civil servant	2.22
	Other	22.23
Annual Average Personal Income	< NT$ 370,000	37.77
	NT$ 370,000 ≤NT$ 680,000	37.78
	>NT$ 680,000 ≤NT$ 1,240,000	15.56
	>NT$ 1,240,000	8.89
Residential Location	Urban	80.00
	Rural	20.00
Information Sources	Trade descriptions	22.22
	Books	51.11
	Investment analysts	31.11
	Advertisements	68.89
	Internet and mobile phones	42.22
	Family conversations	22.22
	Display section	13.33
	School curriculum	20.00
Information Categories	Changes in the real estate market	53.33
	Changes in the stock market	75.56
	Interest rates	51.11
	Inflation	44.44
	Taxation	40.00
	Relating to financial products	55.56

Notes:

[a] Detailed definitions of the variables are provided in Table 1.

[b] Unmarried respondents includes those who were divorced or cohabitating; married respondents includes those who were separated or widowed.

[c] Other professions includes temporary workers, the unemployed and patients who are unable to work.

Table 4 Logistic regression results on financial literacy and derivatives market participation [a]

Variables	Model (1)			Model (2)			Model (3)		
	Coeff.[d]	S.E.	O.R.	Coeff.[d]	S.E.	O.R.	Coeff.[d]	S.E.	O.R.
Constant	−18.986	854.030	5.7 e-06	−20.822	1450.900	9.1 e-10	−19.433	1353.700	3.6e-09
Basic Financial Literacy	−0.135	0.139	0.874	–	–	–	−0.507***	0.166	0.602
Advanced Financial Literacy	–	–	–	0.417***	0.154	1.517	0.723***	0.191	2.060
Age (Base group: ≥60 years)									
20-29 years	13.249	854.030	0.6 e-06	13.923	1450.900	1.1 e-06	13.878	1353.700	1.1 e-06
30-39 years	14.566	854.030	2.1 e-06	15.214	1450.900	4.0 e-06	15.207	1353.700	4.0 e-06
40-49 years	14.306	854.030	1.6 e-06	14.980	1450.900	3.2 e-06	14.905	1353.700	3.0 e-06
50-59 years	14.298	854.030	1.6 e-06	14.867	1450.900	2.9 e-06	14.789	1353.700	2.6e-06
Gender: Male	1.365***	0.371	3.915	1.315***	0.374	3.726	1.264***	0.373	3.539
Marital Status: Married [b]	−0.519	0.394	0.595	−0.552	0.400	0.576	−0.554	0.398	0.575
Education (Base group: Junior high school or below)									
Senior high school	−0.218*	0.700	0.296	−1.271*	0.696	0.281	−1.043	0.702	0.353
Vocational school	−0.782	0.693	0.457	−1.020	0.681	0.361	−0.752	0.691	0.472
University	0.097	0.619	1.102	−0.331	0.601	0.719	0.054	0.621	1.055
Graduate school or above	0.198	0.692	1.220	−0.299	0.674	0.742	0.149	0.696	1.160
Residential Location: Urban	0.454	0.405	1.574	0.390	0.407	1.477	0.431	0.409	1.539
Profession (Base group: Other)[c]									
Full-time student	1.533	1.169	4.631	1.306	1.172	3.693	1.444	1.175	4.237
Full-time job	0.993	1.060	2.700	0.943	1.064	2.568	1.050	1.062	2.857
Domestic homemaker	1.175	1.196	3.237	1.048	1.199	2.851	1.119	1.196	3.062
Retired civil servant	0.758	1.459	2.134	0.910	1.460	2.484	0.981	1.459	2.666
Annual Average Personal Income (Base group: <NTD 370,000)									
NT$ 370,000 ≤NT$ 680,000	0.031	0.451	1.032	−0.158	0.462	0.854	−0.100	0.457	0.905
>NT$ 680,000 ≤NT$ 1,240,000	−0.600	0.624	0.549	−0.907	0.641	0.404	−0.868	0.637	0.420
>NT$ 1,240,000	0.627	0.669	1.872	0.280	0.698	1.323	0.341	0.681	1.406
No. of Obs.	2,523			2,523			2,523		
Pseudo R^2 (%)	11.61			13.19			15.24		

Notes:

[a] Detailed definitions of the variables are provided in Table 1; the dependent variable in this table is 'derivatives market participation'.

[b] Unmarried respondents includes those who were divorced or cohabitating; married respondents includes those who were separated or widowed.

[c] Other professions includes temporary workers, the unemployed and patients who are unable to work.

[d] *** indicates significance at the 1% level; and * indicate significance at the 10% level.

Table 5 Logistic regression results of financial literacy components and derivatives market participation

Variables	Coeff.[d]	S.E.	O.R.
Constant	−18.197	1014.5	1.3e-08
Financial Literacy Components			
Money management and saving	0.112	0.148	1.118
Credit and loan management	0.191**	0.096	1.211
Financial/investment planning	0.196*	0.112	1.217
Insurance/pension planning	−0.548***	0.116	0.578
Age (Base group: ≥ 60 years)			
20-29 years	13.630	1014.5	0.8 e-06
30-39 years	14.914	1014.5	3.0 e-06
40-49 years	14.575	1014.5	2.1 e-06
50-59 years	14.464	1014.5	1.9 e-06
Gender: Male	1.314***	0.374	3.722
Marital Status: Married[b]	−0.711	0.408	0.491
Education (Base group: Junior high school or below)			
Senior high school	−1.085	0.708	0.338
Vocational school	−0.789	0.698	0.454
University	0.047	0.622	1.048
Graduate school or above	0.172	0.700	1.188
Residential Location: Urban	0.420	0.413	1.522
Profession (Base group: Other)[c]			
Full-time student	1.262	1.173	3.531
Full-time job	0.736	1.070	2.087
Domestic homemaker	0.936	1.201	2.548
Retired civil servant	0.480	1.515	1.616
Annual Average Personal Income (Base group: <NTD 370,000)			
NT$ 370,000 ≤NT$ 680,000	−0.076	0.467	0.927
>NT$ 680,000 ≤NT$ 1,240,000	−0.883	0.643	0.413
>NT$ 1,240,000	0.352	0.702	1.422
No. of Obs.		2,523	
Pseudo R^2 (%)		18.09	

Notes:

[a] Detailed definitions of the variables are provided in Table 1; the dependent variable in this table is 'derivatives market participation'.

[b] Unmarried respondents includes those who were divorced or cohabitating; married respondents includes those who were separated or widowed.

[c] Other professions includes temporary workers, the unemployed and patients who are unable to work.

[d] *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 6 Bivariate probit results on the relationship between financial literacy and derivatives market participation

Variables	Stock Market		Derivatives Market	
	Coeff.[b]	t-stat.	Coeff.[b]	t-stat.
Constant	–3.442***	0.222	–6.967	1438.800
Basic Financial Literacy	0.264***	0.035	–0.272***	0.076
Advanced Financial Literacy	0.181***	0.033	0.285***	0.084
Age (Base group: ≥ 60 years)				
20-29 years	–0.131	0.160	4.234	1438.800
30-39 years	0.129	0.141	4.842	1438.800
40-49 years	0.178	0.141	4.756	1438.800
50-59 years	0.366***	0.133	4.606	1438.800
Gender: Male	0.071	0.064	0.568***	0.158
Marital Status: Married	0.053	0.075	–0.222	0.175
Education (Base group: Junior high school or below)				
Senior high school	0.388***	0.114	–0.509	0.284
Vocational school	0.365***	0.125	–0.372	0.285
University	0.368***	0.126	–0.077	0.266
Graduate school or above	0.492***	0.145	–0.039	0.303
Residential Location: Urban	0.034	0.065	0.239	0.177
Profession (Base group: Other)				
Full-time student	–0.314*	0.180	0.645	0.471
Full-time job	0.116	0.131	0.464	0.414
Domestic homemaker	0.337**	0.141	0.547	0.474
Retired civil servant	0.401**	0.184	0.363	0.620
Annual Average Personal Income (Base group: <NTD 370,000)				
NT$ 370,000 ≤NT$ 680,000	0.171***	0.078	–0.001	0.192
>NT$ 680,000 ≤NT$ 1,240,000	0.432***	0.175	–0.391	0.275
>NT$ 1,240,000	0.392**	0.021	0.106	0.314
Log likelihood	–1440.2473			
Rho	0.1384			

Notes:

[a] This table shows the bivariate probit regression results (with asymptotic t-statistics); the model is estimated as a bivariate probit model to control for the potential correlation in the error terms for the two models Definitions of all of the independent variables are provided in Table 1. The regression model includes two dependent variables relating to whether a respondent has experience in the stock or derivatives market; both variables take the value of 1 if the respondent has experience in the market, otherwise 0.

[b] *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 7 Logistic regression results on financial literacy, information sources and derivatives market participation [a]

Variables	Coeff.[d]	S.E.	O.R.
Constant	−19.255	1299.300	4.3e-09
Basic Financial Literacy	−0.629***	0.174	0.533
Advanced Financial Literacy	0.671***	0.192	1.956
Age (Base group: ≥60 years)			
20-29 years	13.721	1299.300	0.9 e-06
30-39 years	15.117	1299.300	3.7 e-06
40-49 years	14.807	1299.300	2.7 e-06
50-59 years	14.624	1299.300	2.2 e-06
Gender: Male	1.325***	0.375	3.763
Marital Status: Married [b]	−0.583	0.400	0.558
Education (Base group: Junior high school or below)			
Senior high school	−1.090	0.707	0.336
Vocational school	−0.831	0.699	0.436
University	−0.049	0.622	0.952
Graduate school or above	0.051	0.700	1.052
Residential Location: Urban	0.453	0.410	1.573
Profession (Base group: Other) [c]			
Full-time student	1.380	1.176	3.973
Full-time job	1.098	1.066	2.999
Domestic homemaker	1.233	1.207	3.431
Retired civil servant	1.021	1.469	2.777
Annual Average Personal Income (Base group: <NTD 370,000)			
NT$ 370,000 ≤NT$ 680,000	−0.096	0.458	0.909
>NT$ 680,000 ≤NT$ 1,240,000	−0.840	0.637	0.432
>NT$ 1,240,000	0.363	0.681	1.437
Information Sources	0.257**	0.106	1.293
No. of Obs.		2,523	
Pseudo R^2 (%)		16.51	

Notes:

[a] Detailed definitions of the variables are provided in Table 1; the dependent variable in this table is 'derivatives market participation'.

[b] Unmarried respondents includes those who were divorced or cohabitating; married respondents includes those who were separated or widowed.

[c] Other professions includes temporary workers, the unemployed and patients who are unable to work.

[d] *** indicates significance at the 1% level; and ** indicates significance at the 5% level.

Table 8 Logistic regression results on financial literacy, information type and derivatives market participation

Variables	Coeff.[d]	S.E.	O.R.
Constant	−19.047	1315.100	4.3e-09
Basic Financial Literacy	−0.685***	0.182	0.533
Advanced Financial Literacy	0.545**	0.202	1.956
Age (Base group: ≥60 years)			
20-29 years	13.715	1315.100	0.9 e-06
30-39 years	14.953	1315.100	3.7 e-06
40-49 years	14.684***	1315.100	2.7 e-06
50-59 years	14.328	1315.100	2.2 e-06
Gender: Male	1.212	0.379	3.763
Marital Status: Married[b]	−0.502	0.406	0.558
Education (Base group: Junior high school or below)			
Senior high school	−1.175	0.719	0.336
Vocational school	−0.991	0.719	0.436
University	−0.223	0.640	0.952
Graduate school or above	−0.126	0.713	1.052
Residential Location: Urban	0.484	0.415	1.573
Profession (Base group: Other)[c]			
Full-time student	1.556	1.210	3.973
Full-time job	1.199	1.099	2.999
Domestic homemaker	1.103	1.222	3.431
Retired civil servant	1.054	1.479	2.777
Annual Average Personal Income (Base group: <NTD 370,000)			
NT$ 370,000 ≤NT$ 680,000	−0.109	0.481	0.909
>NT$ 680,000 ≤NT$ 1,240,000	−0.817	0.650	0.432
>NT$ 1,240,000	0.481	0.697	1.437
Information Sources	0.144	0.120	1.293
Information Categories			
Changes in the real estate market	−0.056	0.358	0.946
Changes in the stock market	1.052**	0.444	2.863
Interest rates	−0.214	0.389	0.807
Inflation	−0.144	0.388	0.865
Taxation	0.989***	0.371	2.686
Relating to financial products	0.389	0.374	1.475
No. of Obs.		2,523	
Pseudo R^2 (%)		18.09	

Notes:

[a] Detailed definitions of the variables are provided in Table 1; the dependent variable in this table is 'derivatives market participation'.

[b] Unmarried respondents includes those who were divorced or cohabitating; married respondents includes those who were separated or widowed.

[c] Other professions includes temporary workers, the unemployed and patients who are unable to work.

[d] *** indicates significance at the 1% level; and ** indicates significance at the 5% level.

Table 9 Robustness checks on the logistic regression results on financial literacy and derivatives market participation, 2007, 2009 and 2011

Variables	Logit		Probit	
	Coeff.[b]	t-stat.	Coeff.[b]	t-stat.
Constant	–5.203***	0.815	–2.531***	0.308
Financial Literacy	–0.125**	0.062	–0.049**	0.024
Age (Base group: ≥60 years)				
20-29 years	0.671	0.724	0.246	0.268
30-39 years	1.202*	0.677	0.468*	0.249
40-49 years	0.986	0.672	0.375	0.248
50-59 years	1.186*	0.636	0.452*	0.235
Gender: Male	0.684***	0.246	0.256***	0.094
Marital Status: Married	–0.464*	0.281	–0.183*	0.110
Education (Base group: Junior high school or below)				
Senior high school	–0.765*	0.407	–0.308**	0.154
Vocational school	–0.228	0.432	–0.106	0.168
University	0.252	0.401	0.087	0.159
Graduate school or above	0.350	0.485	0.123	0.195
Residential Location: Urban	0.360	0.284	0.141	0.108
Profession (Base group: Other)				
Full-time student	0.595*	0.595	0.261	0.235
Full-time job	0.457	0.473	0.181	0.181
Domestic homemaker	–0.103**	0.681	–0.024	0.249
Retired civil servant	0.396**	0.719	0.170	0.275
Annual Average Personal Income (Base group: <NTD 370,000)				
NT$ 370,000 ≤NT$ 680,000	–0.068	0.305	–0.005	0.118
>NT$ 680,000 ≤NT$ 1,240,000	0.121	0.409	–0.023	0.159
>NT$ 1,240,000	0.782	0.544	0.322	0.235
Year 2009 Dummy	–0.196	0.308	–0.097	0.118
Year 2011 Dummy	0.057	0.292	–0.005	0.113
No. of Obs.	6,860		6,860	
Pseudo R^2 (%)	5.28		5.32	

Notes:

[a] Detailed definitions of the variables are provided in Table 1; the dependent variable in this table is 'derivatives market participation'.

[b] Unmarried respondents includes those who were divorced or cohabitating; married respondents includes those who were separated or widowed.

[c] Other professions includes temporary workers, the unemployed and patients who are unable to work.

[d] *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

APPENDIX A

Basic Financial Literacy Questions

Part 1: Money Management and Saving	
1.	If people are suspicious of being scammed, how can they apply to retrieve the balance remaining in a 'watch-listed account'? (select one) ☐ Call the police immediately ☐ Call the 165 anti-fraud hotline ☐ Consult the financial organization in charge of the transaction ☐ All of the above
2.	When gas and electricity prices both rise, our living costs are reduced and our purchasing power is elevated. ☐ Agree ☐ Disagree
3.	When the inflation rate is extremely high, fewer items can be purchased with NT$1,000. ☐ Agree ☐ Disagree
Part 2: Credit and Loan Management	
4.	Do you know how to maintain your personal credit rating? (select one) ☐ The more credit cards I apply for, the more favorable my personal credit rating will be ☐ Pay the payments due for the current period on time ☐ An application for a personal credit report will lower my credit rating ☐ Unsure
5.	How may a bad credit record affect an individual? (select one) ☐ The individual may be rejected from obtaining a bank loan ☐ The loan amount approved may be low, or the loan interest may be high ☐ When applying for credit cards or cash cards, the individual may be rejected or only a low line of credit will be approved ☐ All of the above
6.	Which of the following is correct regarding credit cards? (select one) ☐ A credit card is a payment instrument ☐ Cash advances cannot be obtained from credit cards ☐ Revolving credit is inevitable when using credit cards
7.	When purchasing a car through installments, the total payment will generally be higher than that of a lump sum payment. ☐ Agree ☐ Disagree ☐ Unsure
8.	When people apply for credit cards, the issuing banks will consult the Joint Credit Information Center to inquire into the credit status of the applicants. Did you know that this inquiry requires permission from the applicant? ☐ Yes ☐ No

APPENDIX A (*Contd*.)

Part 3: Financial and Investment Planning	
9.	Which of the following investment options do you consider <u>most likely</u> to be associated with a capital loss? (select all options that apply) ☐ Demand deposits ☐ Time deposits ☐ Stocks ☐ Real estate ☐ Insurance ☐ Bonds ☐ Funds ☐ Foreign currency deposits ☐ Purchasing options or futures ☐ Rotating savings and credit associations ☐ Unsure
10.	What is your view on investment diversification in the stock market? (select all options that apply) ☐ The investment risk may be lowered ☐ The more diversified an investment is, the higher is the return on investment ☐ Even though diversifying investments in different industries can lower risks, the return on investment may also be reduced ☐ I have heard of investment diversification, but am not familiar with it ☐ I have never heard of investment diversification
11.	Regarding the relationship between the investment risk and the return on investment in the stock market, an investment associated with a high return is generally more risky. ☐ Yes ☐ No ☐ The two are not related ☐ Unsure
Part 4: Insurance and Retirement Planning	
12.	When an individual purchases life insurance, can such insurance be cancelled if the purchaser considers it unnecessary? ☐ Yes, within the effective period ☐ No
13.	The risks associated with the birth, aging, illness, and death of an individual can be managed by purchasing insurance. ☐ Agree ☐ Disagree
14.	The risks in life can be reduced by purchasing insurance; thus, the higher the insurance coverage is, the more favorable it is for mitigating risks. ☐ Agree ☐ Disagree
15.	Insurance companies in Taiwan can be divided into two categories: life insurance and product insurance. ☐ Agree ☐ Disagree
16.	Insurance companies are highly secure and are unlikely to go bankrupt. ☐ Agree ☐ Disagree
17.	Because the National Health Insurance is available, purchasing additional medical insurance is not required. ☐ Agree ☐ Disagree
18.	Numerous insurance products (e.g., investment, exponent, and liability types) can also be purchased for security and investment purposes; thus, financial risks exist and policy holders should be cautious. ☐ Agree ☐ Disagree

APPENDIX B

Advanced Financial Literacy Questions

Part 1: Money Management and Saving	
1.	According to the Deposit Insurance Act, what is the maximum insurance coverage allowed for each person? ☐ NT$1.5 million ☐ NT$2 million ☐ NT$3 million ☐ No limit
2.	When the interest rate declines, which of the following should be selected for managing time deposits? (select one) ☐ Floating interest rate ☐ Fixed interest rate ☐ Fixed interest rate regardless of whether the interest rate rises or declines ☐ They are all similar ☐ Never heard of this ☐ Unsure
3.	According to current banking practices, which of the following deposits pay no interest? (select one) ☐ Demand deposits ☐ Time deposits ☐ Round-amount savings ☐ Check deposits ☐ Disagree
Part 2: Credit and Loan Management	
4.	In which of the following organizations can you apply for a personal credit report? (select one) ☐ Financial Supervisory Commission ☐ Joint Credit Information Center/Post Office ☐ Police Department ☐ Household Registration Office ☐ Corresponding bank ☐ Unsure
5.	Under typical circumstances, an extended loan period is associated with high interest. ☐ Agree ☐ Disagree ☐ Unsure
6.	In the term ‘adjustable rate mortgages’ for owner-occupied dwellings, the ‘adjustable rate’ refers to the Taiwan Capitalization Weighted Stock Index ☐ Agree ☐ Disagree ☐ Unsure
7.	The principal and interest that a borrower must pay per month is called the monthly payment. Which of the following factors determines the monthly payment? (select one) ☐ Loan amount ☐ Annual percentage rate ☐ Loan period ☐ All of the above ☐ Unsure
8.	According to the regulations of the Financial Supervisory Commission, unsecured debt for an individual debtor shall not exceed how many times the average monthly salary of the debtor? ☐ 10 ☐ 20 ☐ 22 ☐ 30
9.	Regarding a revolving loan within the margin purchasing limit, which of the following periods concerning the disposable capital is used to calculate the interest? ☐ Day ☐ Week ☐ Month ☐ Year
10.	When managing mortgage loans, can banks request the borrower to provide a surety? (select one) ☐ Yes, each mortgage loan requires a surety ☐ It depends, if the borrower has a spouse, the spouse must serve as the surety ☐ It depends, if the bank obtained a sufficient guarantee, the bank cannot, for any reason, request the borrower to provide a surety

APPENDIX B (*Contd*.)

Part 3: Financial and Investment Planning	
11.	Office workers have in recent years allowed investment amounts to be deducted periodically from their personal salary as a form of financial planning. Which of the following statements is correct? (select one) ☐ A fixed investment involves grasping the timing for diversifying the investment to average the investment cost and reduce the investment risk ☐ People should reduce (increase) the investment amount when the prices of the fixed investment are favorable (unfavorable) ☐ Both statements are correct
12.	When the interest rate increases, how will the bond price change? ☐ Increases ☐ Decreases ☐ The two are not related ☐ Depends on the issuer ☐ Unsure
13.	The return on investment (investment risk) of overseas funds is higher (lower) than that of domestic funds. ☐ Agree ☐ Disagree ☐ Unsure
14.	A monetary fund is mainly associated with investments in the currencies of various countries ☐ Agree ☐ Disagree ☐ Unsure
15.	An open-end fund is purchased from the issuing investment trust company; however, a closed-end fund must be purchased and sold in the concentrated market through securities brokers. ☐ Agree ☐ Disagree ☐ Unsure
Part 4: Insurance and Retirement Planning	
16.	Which of the following factors prompt people to be extra prepared for retirement? (select one) ☐ Return on assets ☐ Inflation rate ☐ Salary growth rate ☐ All of the above
17.	If you are about to retire, which of the following methods are appropriate for you to accumulate your pension fund? (select all options that apply) ☐ Time deposits ☐ Purchasing mutual funds ☐ Purchasing deposit insurance ☐ Purchasing transactions or bonds ☐ Investing in domestic and international stocks ☐ Purchasing derivative products, such as options or futures ☐ Unsure
18.	According to the National Pension Act, which of the following statements is correct? (select one) ☐ Everyone aged between 25 and 65 must participate in the National Pension Insurance, regardless of whether the person has Public Employee Insurance, Labor Insurance, or Farmers Insurance ☐ Insured persons must cover their own insurance premium, which is not subsidized by the government. ☐ If the insurant failed to pay the insurance premium on time, no delinquency charge will be imposed, but additional interest will be charged ☐ None of the above
19.	Which of the following items does the National Pension cover? (select one) ☐ Elderly pensions ☐ Funeral expenses ☐ Pensions for people with disabilities ☐ Pensions to the relatives of the deceased ☐ All of the above

APPENDIX C

Construction of the Financial Literacy Indices

Index Construction		Factor loadings
Panel A: Basic Financial Literacy Questions		
1.	When suspecting or suffering from a fraud, how does one apply to retrieve the remaining balance of a "watch-listed account"?	0.2688
2.	When gas and electricity prices rise, our cost of living is reduced and our purchasing power is elevated.	0.2774
3.	In the case of an excessively high inflation rate, the purchasing power of the same NTD 1,000 is reduced.	0.3366
4.	Do you know how to maintain your credit rating?	0.5053
5.	How will a bad credit record affect an individual?	0.3471
6.	With regard to credit cards, which of the following options is correct?	0.3033
7.	When purchasing a car through installments, the total expenditure is usually higher than a lump-sum cash payment.	0.5309
8.	When individuals apply for credit cards, the bank consults the Joint Credit Information Center to inquire into the applicants' credit status; did you know that the bank needed your approval to do this?	0.3937
9.	Which of the following investments are more likely to suffer from a capital loss?	0.5796
10.	What is your view on diversified investments in the stock market?	0.3827
11.	Regarding the relationship between risks and returns on the stock market, is an investment with a higher return generally more risky?	0.5339
12.	After buying life insurance, is there any possibility for revocation if it is no longer needed?	0.2917
13.	A person can cope with the risks of birth, senility, illness, and death by means of insurance.	0.1712
14.	The risks in life can be reduced by purchasing insurance; thus, the higher the insurance coverage is, the more favorable it is for mitigating risks.	0.2592
15.	Domestic insurance companies can be divided into two types: life insurance and product insurance.	0.3060
16.	Insurance companies are the most secured, thus cannot go bankrupt.	0.3268
17.	Because of the National Health Insurance, no other extra medical insurance is needed.	0.4080
18.	Numerous insurance products (e.g., investment, exponent, and liability types) can also be purchased for security and investment purposes; thus, financial risks exist and policy holders should be cautious.	0.4215

APPENDIX C (*Contd*.)

Index Construction		Factor loadings
Panel B: Advanced Financial Literacy Questions		
19.	According to the Deposit Insurance Act, what is the maximum insured sum per person for deposit protection?	0.2763
20.	When the interest rate declines, what should be chosen when handling fixed deposits?	0.4358
21.	According to current banking practices, which of the following deposits are not covered by interest?	0.4368
22.	Which institute should you apply to for a personal credit report?	0.1867
23.	Under normal circumstances, the longer the loan period, the higher the borrowing rate.	0.1465
24.	In the term "adjustable rate mortgages" for owner-occupied dwellings, the "adjustable rate" refers to the Taiwan Capitalization Weighted Stock Index.	0.4216
25.	The principal and interest that a borrower must pay is referred to as the monthly payment, with the amount depending on what factors?	0.4741
26.	According to the regulations of the Financial Supervisory Commission, the unsecured debt for an individual debtor shall not exceed how many times of the average monthly salary of the debtor?	0.3503
27.	On what period basis is the interest accounted for in revolving loans within the margin purchasing limit?	0.1463
28.	When managing mortgage loans, are banks allowed to require the borrower to provide a surety?	0.3781
29.	Office workers have in recent years allowed investment amounts to be deducted periodically from their personal salary as a form of financial planning. Which of the following statements is correct?	0.0237
30.	What changes occur to bond prices when interest rates rise?	0.4441
31.	Overseas funds result in higher returns than domestic funds, and are accompanied with lower risks.	0.5382
32.	Monetary funds refer mainly to investments made in the currencies of various countries.	0.2725
33.	Open-end funds can be purchased from the issuing investment firm, but closed-end funds need to be purchased or sold in the concentrated market through a securities broker.	0.3931
34.	What factors prompt individuals to be prepared for retirement?	0.1494
35.	If you are about to retire, which of the following are appropriate to accumulate your pension?	0.0661
36.	According to the current national pension system, which of the following is correct?	0.1656
37.	Which of the following items do national pension benefits include?	0.0577

科技部補助國內專家學者出席國際學術會議報告

106 年 8 月 14 日

附件三

報告人姓名	蔡維哲	服務機構及職稱	國立中山大學財管系副教授
時間 會議 地點	106/1/7 - 106/1/8 日本京都與彥根	本會核定 補助文號	
會議名稱	（中文） （英文）The 12th International Conference on Asian Financial Markets and Economic Developments		
發表論文題目	（中文） （英文）Intraday Trading Activity of VIX Derivatives		

報告內容應包括下列各項：

一、參加會議經過

長崎大學長期舉辦亞洲財務市場與經濟發展的國際研討會，2017 年的國際研討會與位於彥根的滋賀大學共同舉辦，會議為期兩天，比較特別的是第一天是在京都舉行，第二天則是移師至滋賀大學舉行。會議場次涵蓋市場微結構、公司理財、資產定價、銀行、波動度、與財政政策等場次。

我的報告文章在會議中獲得評論人以及與會聽眾們非常多寶貴的評論與建議，對於我自己研究文章後續的大修有非常大的幫助。我也積極參與其他場次的研究文章發表，對於吸收最新的研究方向與創新思考有非常大的助益，非常感謝科技部此次的經費補助支持。

二、與會心得

此次參與充分感受到主辦單位的用心，畢竟議程牽涉兩地交通轉換，所以主辦單位事前就非常細心地規劃每項細節。大會除了有精準的流程安排，也動員非常多專職工作人員協助活動進行，這些規劃細節確實讓我深刻體驗到如何推動大型學術活動。

三、考察參觀活動(無是項活動者省略)

無。

四、建議

謝謝科技部補助後學參與此次亞洲財務盛會。會議上的非常多研究文章都是最新完成，甚至

都沒有開放全文給聽眾下載，必須親自出席聆聽才能了解現在的研究前緣議題，這是對我此次與會最大的幫助之一，因此非常建議多補助國內年輕學者出席這類高品質盛會。

五、攜回資料名稱及內容

大會會議手冊與研究文章摘要。

攜回資料如下所列：

Session A1 (Microstructure I) 10:20 - 12:40 (Room D) Chair: Masayuki Susai (Nagasaki University)

Just Why Foreign Institutional Investors Have Superior Trading Performance than the Locals: A study of the Taiwan Futures Market

Pei-Shih Weng (National Dong Hwa University, Taiwan)

Discussant: Wei-Che Tsai (College of Management, National Sun Yat-sen University)

A Rare Move: The Effect of Switching from a Closing Call Auction to a Continuous Trading

Ya-Kai Chang (Department of Finance, Chung Yuan Christian University)

Discussant: Te-Chien Lo (Department of Finance, National Dong Hwa University)

An Analysis on the Intraday Trading Activity of VIX Derivatives

Wei-Che Tsai (College of Management, National Sun Yat-sen University)

Discussant: Ya-Kai Chang (Department of Finance, Chung Yuan Christian University)

Online Search Activities and Investor Attention on Financial Markets

Te-Chien Lo (Department of Finance, National Dong Hwa University)

Discussant: Jian Ni (Southwestern University of Finance Economics)

Session B1 (Asset Pricing I) 13:50 - 15:00 (Room D) Chair: Kentaro Kikuchi (Shiga University)

Price Limits and the Value Premium in the Taiwan Stock Market

Kuan-Cheng Ko (National Chi Nan University), Nien-Tzu Yang (Nanzy) (Department of Business Management, National United University)

Discussant: Bo Zhu (Southwestern University of Finance and Economics)

How well do prominent asset pricing modelsp rice the cross-section of returns?

Xiang Zhang (School of Finance, Southwestern University of Finance and Economics)

Discussant: Hongyan Fang (School of Finance, Southwestern University of Finance and Economics)

Session A2 (Corporate Finance I) 10:20 - 12:05 (Room C) Chair: Masayo Shikimi (Nagasaki University)

Illiquidy Based Factor Construction in Asset Pricing: An Aanlysis on Long Run Performance of Sri Lankan Initial Public Offering Stocks

T.C Ediriwickrama (Department of Finance, University of Colombo, Sri Lanka), A.A.Azeez (Department of Finance, University of Colombo, Sri Lanka)

Discussant: Chia-Hui Huang (Department of Economics, Aletheia University, Taiwan)
Linguistic Distance and Mergers and Acquisitions: Evidence from China
Duan Yang (Department of Finance and Decision Science, Hong Kong Baptist University)
Discussant: Hocheol Nam (Graduate School of Economics, Kyushu University)
Going public in bear markets
Pengda Fan (Graduate School of Economics, Kyushu University)
Discussant: A.A.Azeez (Department of Finance, University of Colombo, Sri Lanka)

Session B2 (Banking & Finance I) 13:50 - 15:00 (Room C) Chair: Kazuo Yamada (Nagasaki University)
Relationship Lending, Market Structure and Mission Drift in Small Loan Companies: a Theoretical Model and Evidence from China
Zhoujie Weng (School of Finance, Southwestern University of Finance and Economics)
Discussant: Chen Chunfa (College of International Studies, Sichuan University)
Who Can Get Money?E vidence from the Chinese Peer-to-Peer Lending Platform
Ziming Lin (Southwestern Univeristy of Finance and Economics), Qizhi Tao (School of Finance, Southwestern University of Finance and Economics)
Discussant: Masayo Shikimi (Nagasaki University)
Quadratic Gaussian Term Structure Model with the Time-Varying Lower Bound
Kentaro Kikuchi (Faculty of Economics, Shiga University)
Discussant: Wei Zhou (Southwestern University of Finance Economics)
Robust American Option Pricing Based on Gradient Strategies
Shan Xue (Southwestern University of Finance and Economics), Ye Du (Southwestern University of Finance and Economics)
Discussant: Hiroshi Moriyasu (Nagasaki University)
Swing in the Fed's balance sheet policy and spillover effects on emerging Asia: Evidence from a structural panel VAR model
Togba Boboy Yvesa (Department of Economics, Pusan National University)
Discussant: Hao Kang (Southwestern University of Finance Economics)
Asymmetric volatility, leverage effect, and risk-return relationship in equity market: Evidence from Markov regime-switching model
Peiming Wang (Faculty of Business and Law, Auckland University of Technology)
Discussant: Dong Zhang (Stockholm Business School, Stockholm University)

Session D1 (Volatility II) 11:20 - 12:30 (Room 5) Chair: Taro Kanatani (Shiga University) Modelling the Implied Volatility SurfaceB ased on Shanghai 50ETF Options
Hao Kang (Southwestern University of Finance Economics), Jinzhong Wang (Southwestern University of Finance Economics)
Discussant: Shailendra Kumar (Indian Institute of Information Technology Allahabad (IIITA) UP)

Market Openness and Price Discovery in Gold Markets
Caihong Xu (Stockholm Business School, Stockholm University), Dong Zhang (Stockholm Business School, Stockholm University)
Discussant: Takashi Matsuki (Osaka Gakuin University)
Systemic Risk or Systematic Risk?M easurement and Test Based on the EVT-Copula Model
Bo Zhu (Southwestern University of Finance and Economics) , Yao Zhou (Southwestern University of Finance and Economics)
Discussant: Nien-Tzu Yang (Nanzy) (Department of Business Management, National United University)
Private Equity Performance and Capital Flows: Evidence from China
Hongyan Fang (School of Finance, Southwestern University of Finance and Economics)
Discussant: Xiang Zhang (School of Finance, Southwestern University of Finance and Economics)

Session F1 (Volatility III) 15:10 - 16:20 (Room 5) Chair: Taro Kanatani (Shiga University)
Examining the Growth-Risk Relationship using Panel VAR Model
Shailendra Kumar (Indian Institute of Information Technology Allahabad (IIITA) UP)
Discussant: Togba Boboy Yvesa (Department of Economics, Pusan National University)
Unconventional Monetary Policies and I nternational Spillover to Asian Stock Markets
Kimiko Sugimoto (Konan University), Takashi Matsuki (Osaka Gakuin University)
Discussant: Peiming Wang (Faculty of Business and Law, Auckland University of Technology)

Session D2 (Banking & Finance II) 11:20 - 12: 30 (Room 6) Chair: Hiromasa Okada (Nagasaki University) Are China's Industrial Policies Effective?- - based on an Empirical Study from the Corporate Financing Perspective
Chen Chunfa (College of International Studies, Sichuan University), Zhang Tengwen (College of International Studies, Sichuan University)
Discussant: Zhoujie Weng (School of Finance, Southwestern University of Finance and Economics)
Financial Development and Reallocation of Capital in Business Group during the Global Financial Crisis
Masayo Shikimi (Nagasaki University), Kazuo Yamada (Nagasaki University)
Discussant: Ziming Lin (Southwestern Univeristy of Finance and Economics)
Government Subsidies, Political Connections and Corporate Performance: Evidence from Private Listed Enterprises in China
Dongliang Cai (Southwestern University of Finance and Economics), Zhen Yang (Southwestern University of Finance and Economics)
Discussant: Vladimir Hlasny (Ewha Womans University, Korea)

Can a Comparative Capitalism Approach Explain Fiscal Policy Activism?
Vladimir Hlasny (Ewha Womans University, Korea)
Discussant: Dongliang Cai (Southwestern University of Finance and Economics)
Session F2 (Microstructure II) 15:10 - 16:20 (Room 6) Chair: Masayuki Susai (Nagasaki University)
The Spillover Effects of the Chinese Star Funds on the Investors in the Stock Market
Yicheng Sun (Ernst & Young Hua Ming LLP Chengdu Branch)
Discussant: Pei-Shih Weng (National Dong Hwa University, Taiwan)
Profit Manipulation and High Proportion of Stock Split: T he Hidden Chains of Interest Transmission
Heng Liao (Management School, Renmin University of China)
Discussant: Yicheng Sun (Ernst & Young Hua Ming LLP Chengdu Branch)

Accounting Flexibility and Crash Risk
Wei Zhou (Southwestern University of Finance Economics), Feixia Wu (Southwest University of Science and Technology), Jian Ni (Southwestern University of Finance
Discussant: Kentaro Kikuchi (Faculty of Economics, Shiga University)
Output Convergence across Asian Countries
Takashi Matsuki (Osaka Gakuin University)
Discussant: Shan Xue (Southwestern University of Finance and Economics)
The Social Responsibility of Business and Financial Performance: Taiwan Evidence
Chia-Hui Huang (Department of Economics, Aletheia University, Taiwan)
Discussant: Pengda Fan (Graduate School of Economics, Kyushu University)
Trade credits and shareholder wealth: Evidence from North Korea shock on South Korean companies
Hocheol Nam (Graduate School of Economics, Kyushu University)
Discussant: Duan Yang (Department of Finance and Decision Science, Hong Kong Baptist University)

六、其他
無。

105年度專題研究計畫成果彙整表

計畫主持人：蔡維哲						**計畫編號：**105-2629-H-110-001-	
計畫名稱：個人參與台灣衍生性商品市場之性別分析(V02.V04)							
成果項目						量化	單位	質化 （說明：各成果項目請附佐證資料或細項說明，如期刊名稱、年份、卷期、起訖頁數、證號...等）
國內	學術性論文	期刊論文				0	篇	
		研討會論文				1		研究成果發表於2017台灣財務金融年會與2017台灣財務工程學會年會
		專書				0	本	
		專書論文				0	章	
		技術報告				0	篇	
		其他				0	篇	
	智慧財產權及成果	專利權	發明專利	申請中		0	件	
				已獲得		0		
			新型/設計專利			0		
		商標權				0		
		營業秘密				0		
		積體電路電路布局權				0		
		著作權				0		
		品種權				0		
		其他				0		
	技術移轉	件數				0	件	
		收入				0	千元	
國外	學術性論文	期刊論文				0	篇	
		研討會論文				1		研究成果發表於2017台灣財務金融年會與2017台灣財務工程學會年會
		專書				0	本	
		專書論文				0	章	
		技術報告				0	篇	
		其他				0	篇	
	智慧財產權及成果	專利權	發明專利	申請中		0	件	
				已獲得		0		
			新型/設計專利			0		
		商標權				0		
		營業秘密				0		
		積體電路電路布局權				0		
		著作權				0		

		品種權	0		
		其他	0		
	技術移轉	件數	0	件	
		收入	0	千元	
參與計畫人力	本國籍	大專生	0	人次	
		碩士生	0		
		博士生	0		
		博士後研究員	0		
		專任助理	0		
	非本國籍	大專生	0		
		碩士生	0		
		博士生	0		
		博士後研究員	0		
		專任助理	0		
其他成果 （無法以量化表達之成果如辦理學術活動、獲得獎項、重要國際合作、研究成果國際影響力及其他協助產業技術發展之具體效益事項等，請以文字敘述填列。）					

科技部補助專題研究計畫成果自評表

請就研究內容與原計畫相符程度、達成預期目標情況、研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）、是否適合在學術期刊發表或申請專利、主要發現（簡要敘述成果是否具有政策應用參考價值及具影響公共利益之重大發現）或其他有關價值等，作一綜合評估。

1. 請就研究內容與原計畫相符程度、達成預期目標情況作一綜合評估
   ■達成目標
   □未達成目標（請說明，以100字為限）
   　□實驗失敗
   　□因故實驗中斷
   　□其他原因
   說明：

2. 研究成果在學術期刊發表或申請專利等情形（請於其他欄註明專利及技轉之證號、合約、申請及洽談等詳細資訊）
   論文：□已發表　□未發表之文稿　■撰寫中　□無
   專利：□已獲得　□申請中　■無
   技轉：□已技轉　□洽談中　■無
   其他：（以200字為限）

3. 請依學術成就、技術創新、社會影響等方面，評估研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性，以500字為限）
   本研究探討民眾具備較高的金融知識是否比較積極參與衍生性金融商品市場。問卷實證結果顯示具備進階金融知識的民眾比較可能會參與衍生性商品市場，而具備基礎金融知識的民眾與參與衍生性金融商品市場成反向關係，這結果恰巧與文獻上的股票市場參與結果相反。影響民眾參與衍生性金融商品市場比較相關的知識領域分別是信貸與投資方面知識，此外，知識來源越分散，民眾參與衍生性金融商品市場的能性就越高。

4. 主要發現
   本研究具有政策應用參考價值：□否　■是，建議提供機關行政院金融監督管理委員會,高雄市政府,
   （勾選「是」者，請列舉建議可提供施政參考之業務主管機關）
   本研究具影響公共利益之重大發現：■否　□是
   說明：（以150字為限）
   本研究實證結果顯示具備進階金融知識的民眾比較可能會參與衍生性商品市場，影響民眾參與衍生性金融商品市場比較相關的知識領域分別是信貸與投資方面知識，此外，知識來源越分散，民眾參與衍生性金融商品市場的能性就越高。