ORIGINAL PAPER

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DOI: 10.26794/2587-5671-2026-30-1-1583-04
JEL A22, C83, I21, I23

Assessing the Impact of a "Futures & Options" Course on Finance Majors: Insights from a Futures & Options Course Study in China

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ABSTRACT

The "Futures & Options" (F&O) course is a major for financial students to learn to identify and recognize risks, master the skills and methods of risk management, and shape risk-oriented thinking. The purpose of the study is to identify the impact of the F&O course on the professional thinking, life and future work of students. This study used a survey on finance students (n = 534) of Tongling University of China who have studied F&O course over the past two years. Research questions: (1) How do students currently perceive the F&O course? (2) What factors influence the current perception of F&O students? (3) Does the impact of the F&O course on life/future employment and student development vary by gender? (4) Does the impact of the F&O course on life/future employment and student development vary depending on their knowledge of futures and options? (5) Does the impact of the F&O course on the life/future work and development of students vary depending on their participation in equity and fund investments? (6) Will the impact of the F&O course on the life/future employment and development of students vary depending on their participation in futures and options investments? The results of the study showed that the level of knowledge of male students was slightly higher than that of female students, and there were no gender differences in the impact of the F&O course on the life/future employment and development of students. Students who identified themselves with higher value of usefulness and ability of risk management did not participate in investing F&O. Students with higher knowledge level perform better than the others. It was concluded that, in general, the level of knowledge of students is better within the current educational model, the readiness of students to participate in practice is low, and the cultivation of risk awareness is not ideal.

Keywords: 'Futures & Options'; thinking mode; finance education; economics teaching; financial literacy; China

For citation: **Zhang Z., Tinmaz H. Assessing the impact of a futures & options course on finance majors: Insights from a futures & options course study in China. *Finance: Theory and Practice*. 2026;30(1):X–X. DOI: 10.26794/2587-5671-2026-30-1-1583-04**

ОРИГИНАЛЬНАЯ СТАТЬЯ

Оценка влияния курса «Фьючерсы и опционы» на студентов-финансистов: результаты исследования в Китае

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АННОТАЦИЯ

Курс «Фьючерсы и опционы» (F&O) является основным для студентов-финансистов, позволяющим научиться определять и распознавать риски, овладеть навыками и методами управления рисками, а также сформировать мышление, ориентированное на риск. **Цель** исследования: выявить влияние курса F&O на профессиональное мышление, жизнь и будущую работу студентов. Проведен опрос студентов-финансистов (n = 534) китайского университета Тонглинг, изучавших курс F&O в течение последних двух лет. Исследовательские вопросы: Как студенты в настоящее время воспринимают курс F&O? Какие факторы влияют на текущее восприятие студентами курса F&O? Различается ли влияние курса F&O на жизнь / будущую работу и развитие студентов в зависимости от пола? Отличается ли влияние курса F&O на жизнь / будущую работу и развитие студентов в зависимости от их знаний о фьючерсах и опционах?

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Отличается ли влияние курса F&O на жизнь / будущую работу и развитие студентов в зависимости от их участия в инвестициях в акции и фонды? Отличается ли влияние курса F&O на жизнь / будущую работу и развитие студентов в зависимости от их участия в инвестициях во фьючерсы и опционы? Результаты исследования показали, что уровень знаний у студентов-мужчин немного выше, чем у студентов-женщин, а в отношении влияния курса F&O на жизнь / будущую работу и развитие студентов — гендерных различий нет. Студенты, которые определили для себя более высокую ценность полезности и способности управления рисками, не участвовали в инвестировании F&O. Студенты с более высоким уровнем знаний показывают лучшие результаты, чем остальные. Сделан **вывод**, что в целом уровень знаний студентов лучше в рамках текущей образовательной модели, готовность студентов участвовать в практике невелика, а культивирование осознания рисков не является идеальным.
Ключевые слова: фьючерсы и опционы; режим мышления; финансовое образование; преподавание экономики; финансовая грамотность; Китай

Для цитирования: **Zhang Z., Tinmaz H. Assessing the impact of a futures & options course on finance majors: Insights from a futures & options course study in China. *Финансы: теория и практика.* 2026;30(1):X–X. DOI: 10.26794/2587-5671-2026-30-1-1583-04**

INTRODUCTION

The growth of macro risks is commonly perceived by the global financial market. In recent years, the outbreak of risk events such as pandemic and wars has exacerbated this situation. The hedging demand of global investors has increased significantly, promoting the rapid expansion of the derivatives market. The transaction volume of the global derivatives market has increased significantly in recent years. The derivatives market has become one of the most important finance and investment markets in the world. The design logic of derivatives is to define a certain quantifiable asset as the underlying asset and design it as a derivative after adding a time attribute. The price of the derivative depends on the change in the price of the underlying asset, so traders can use the correlation between the two to avoid risks and enable effective risk management [1]. The most commonly used derivatives are futures derivatives and option derivatives. The research of this paper will focus on the "Futures & Options" (F&O) course education of college students.

In order to improve students' learning situation and promote their application ability, plenty of applied teaching methods are used in course teaching, such as simulated transactions, business practice competitions, innovative design competitions, etc. In addition, the advocacy in teaching design is not only to let students learn to apply theoretical knowledge mechanically, but also to help students establish a professional thinking mode and cultivate risk management awareness. Applying the theoretical model of F&O flexibly to various aspects of life is like obtaining a flexible tool to help deal with various types of events in life. This is of significant significance for cultivating students' financial literacy and improving their professional application capabilities.

This study aims to assess students' mastery and application of knowledge, particularly in professional contexts, through a survey designed to gauge their proficiency in employing professional thinking to address diverse challenges across various life scenarios. The establishment of risk awareness, facilitated by courses in 'F & O', empowers finance majors with enhanced risk management and response capabilities, thereby contributing to the stability and healthy development of the financial industry. By delineating the construction of students' professional thinking modes, educators can iteratively refine teaching methodologies and optimize instructional approaches, serving as a theoretical blueprint for educators offering F&O courses. Furthermore, by investigating the impacts of F&O education on students' perceptions, development, and future employment prospects, the study seeks to bridge the gap between theoretical knowledge and practical application, equipping students with essential skills to navigate both personal and professional challenges effectively.

LITERATURE REVIEW

Research on economics teaching is very rich, and some scholars focus on the value of economics education. Refrigeri and Aleandri [2] believed that the immaturity of economics teaching is manifested in the lack of certain social benefits in teaching results, and economics teaching presents the problem of ineffectiveness and low efficiency of social value. College students can effectively improve their financial literacy by participating in economics courses. The improvement of financial literacy can enable students to solve small financial problems in their lives. Economics education is effective and feasible for the growth of students [3].

The research on teaching methods in economics and finance has also been researched and paid attention to. Machin [4] analyzed the upsurge of research on

economics education during the fifteen years from 2000 to 2014. The continuous innovation of methods and their wide application in related fields of life have led to continuous attention to economics education, and this situation will continue. From chalk and discussion, to combined teaching after the rise of computers, to richer practical teaching methods, the theoretical teaching of financial economics is constantly being innovated [5].

In the teaching process, the cultivation of cognitive ability and thinking is also an important direction for scholars to study. Students' improvement in achievement is important, but this does not mean that students have completed the mastery of skills and can improve social well-being in the future. Therefore, attention should be paid to the quality of teaching and the improvement of students' cognitive skills. Studies have shown that students' cognitive abilities have a causal relationship with national economic growth and have a significant growth effect on the economic development of developed countries, especially developing countries [6]. Good thinking patterns and cognitive skills can also enable students to better deal with financial problems around them [7]. Molina-García et al. [8] discovered that the risk-taking propensity is directly and positively influenced by students' knowledge level and behavior in finance. As the most core risk management tools in the financial market, F&O courses are widely used and researched in real life. It is important to pay attention to risks, guide students to think critically about risks, and participate in holistic risks in the process of solving problems [9]. Students can better establish a thinking model and enhance risk management awareness during the study.

The pricing of F&O comes from the underlying asset and provides some pricing guidance for the underlying asset in the transaction, which is called the price discovery function. Hao et al. [10] studied the influence of the price change of the derivatives market on commodity prices in real life, taking soybean as the research object, and demonstrated the importance of F&O in price discovery. Ma et al. [11] analyzed the relationship between seasons and commodity prices and emphasized the impact of F&O on residents' daily lives. These studies demonstrate the importance of F&O markets in guiding the prices of underlying assets and the impact of risk management. By providing market participants with a way to manage price risk, F&O can help stabilize prices and promote economic growth. However, effective use of these tools requires an in-depth understanding of the underlying assets and derivatives, and users also need to identify their needs for risk management.

F&O originates in commodity markets, which are related to our daily lives. By understanding this course, students can better understand how to use these tools to manage risk and generate profits in commodity and financial markets. This knowledge can be applied to many aspects of life, such as managing personal investments, buying goods and services, and even making decisions about career paths. By establishing a future mindset, students can develop a way of thinking and improve their financial literacy, which will enable them to identify opportunities for risk management and profitability in their daily lives [12, 13].

Currently, the theoretical and practical significance of F&O course is widely recognized. The teaching methods of finance are constantly updated and enriched. The value of building professional thinking and developing cognitive skills is increasingly recognized in this field. Based on solid research, this article takes students majoring in finance at Chinese University as participants and discusses how to strengthen the teaching of F&O course, guide students to establish professional thinking, and cultivate effective cognition of abilities. Analyze the completion of students' courses and summarize their experience and lessons, further explore, and strengthen professional education, and provide theoretical and methodological support for other institutions to cultivate students' professional abilities.

In this research, the impacts of F&O course on life and future work are considered the main dependent variables that were investigated by the questionnaire. Based on that, six research questions are developed, as follows:

1) What are the students' current perceptions regarding F&O course?

2) What factors affect students' current perceptions regarding F&O course?

3) Does the impact of F&O course on students' lives / future work, and development differ by gender?

4) Does the impact of F&O course on students' lives / future work and development differ depending on their knowledge of F&O?

5) Does the impact of F&O course on students' lives / future work and development differ depending on their involvement in Stocks & Fund investment?

6) Does the impact of F&O course on students' lives / future work and development differ depending on their involvement in F&O investment?

METHOD

Research Context

A F&O course could lead students to understand various risks in our lives, to correctly understand

these risks, and to master how to deal with and manage these risks. This learning process could be called the establishment of risk-aware thinking. It is very important for teachers to understand whether students have mastered the theoretical knowledge of F&O, and effectively develop a risk-aware ability.

Besides, the lack of applicability of theoretical education has been one of the biggest pain points for finance professional education for a very long time. This research tries to strengthen applied education on the basis of theoretical education so as to have a positive impact on students' future development and employment. Through the educational method, educators can enhance students' application ability and prevent students from quickly forgetting after theoretical study. After students effectively establish this thinking mode to improve their financial literacy, they can better deal with the challenges in life and work.

Study Sample & Instrument

The students who major in finance at Tongling University in China are the research participants. There are about 400 to 500 freshmen who enter the school of finance every year. Considering the adjustment of textbooks and teaching programs every period of time, students who have studied F&O courses in the past two years were selected as the whole of the research.

The survey was divided into three parts: demographics, questions about the impact on life, and questions about the impact on future work and development. In the first part, there are four questions about gender, knowledge level about F&O, and whether students participated in investing in stocks and funds or F&O. And the next two parts are designed with regard to how learning F&O lessons may influence them. The design of the questionnaire was inspired by Tinmaz and Lee [14]. This study believes that the formation of a thinking mode through course learning is similar to the application of a tool, so this survey is designed. Considering that the participants are all Chinese students, the questionnaire was translated into Chinese with experts checked.

Reliability and Validity Measures

Although the concepts of reliability and validity are similar, they express different properties of measurement tools. It is necessary to analyze the validity and reliability of the data. Therefore, we need to measure both validity and reliability to ensure that the interpretation of data analysis is healthy [15].

Cronbach's alpha was used to analyze the reliability of the data and to measure the internal consistency of a test or scale [16]. Internal consistency describes the degree to which all items in a test measure the same structure, so it is about how the items in a test relate to each other. When the value of alpha is greater than 0.80, which means the reliability is very good. Validity refers to the degree to which something is accurately measured. Therefore, high validity means high validity of the measured features.

Factor analysis was applied to the survey to identify the factors underlying the variables. The survey questions were divided into several clusters based on their similarity. The technique is particularly useful when the research objectives are in some logical subsets [17]. It can help researchers explore the relationships between survey questions and group the questions into any number of dimensions as required [18]. Moreover, factor analysis provides better construct validity for the study.

RESULTS & FINDINGS

Demographics

In this study, 534 students (299 female and 235 male) majoring in finance at Tongling University in China who registered for the F&O course in last two years participated in this survey. In the knowledge content, most students noted that their knowledge about F&O is at a "regular" level. Although the number of male students is less than that of female students, there are more male students who have "very good" knowledge than female students. Combined with the statistics of real grades, the number of male students with grades of "very bad" is slightly larger than that of female students. Generally, the statistics are relatively close to reality.

For students who participated in investing, the number of involvements of Funds & Stocks or F&O investment, is very similar, being higher than 50%, 57.12% and 52.62% respectively. Considering they are students majoring in finance, the number is relatively low. The professional compulsory courses teach students a lot of investment-related knowledge, but still nearly half of the students are not interested in participating in financial investment and do not participate in investment.

There are three questions with the highest mean scores. Interestingly, all these three questions come from the life part. These three mean scores are 3.67, 3.69, 3.78 respectively, which are close to 4 (agree level) from questions 1, 17, 4. These questions are all related to the feeling after having lessons, which shows that students are satisfied after having the lessons.

Three questions with the lowest mean scores are shown. Similarly, these questions are coming from the future work and development part. The scores are 3.22, 3.25 and 3.27, which are close to 3 (regular level), and these three questions are related to the work choice and cognition of risks, which are questions 4, 5, 7. Students held a relatively indifferent attitude towards engaging in the derivatives industry.

Exploratory Factor Analysis on survey questions

Students were given two parts of scale questions in order to analyze the impact of F&O courses on students' cognition and thinking patterns. There are 18 questions about how students learn and use knowledge in their lives. The Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity were used. The KMO coefficient is 0.95 and the significance value is 0.00 (Bartlett's Test of Sphericity). The results indicate that it is enough to conduct the analysis.

No question was deleted, and the Cronbach's alpha of 18 questions is 0.94, which means analysis is reliable. In Table 1, 18 questions are divided into three factors; students found that study F&O courses is useful (α = 0.92), students focus more about market (α = 0.91). The reliability of overall questions and questions in each factor is at a very high level.

The mean value of factor 1 is 3.59, and standard deviation is 0.91. The mean value of factor 2 is 3.37 and standard deviation is 1.03. The mean value of factor 3 is 3.44 and standard deviation is 0.99.

All three factors explained 69.436% of the total variance. Factor 1 accounted for 50.19%, factor 2 accounted for 11.70% and factor 3 accounted for 7.55% of the variance.

In the second part of scale questions, 19 questions about the impact on future work and development were given to students (Table 2). Question 6 (I have a reasonable understanding of the various risks in the market, M = 3.34, SD = 1.16) and question 7 (I am happy to take risk in the market, M = 3.22, SD = 1.18) were deleted from the analysis, and the Cronbach's Alpha of 17 questions is 0.94. The KMO coefficient is 0.94 and significance value is 0.00 (Bartlett's Test of Sphericity). In Table 5, 17 questions are divided into three factors; awareness of risks (α = 0.92), willingness to work in the derivatives industry (α = 0.92), and ability to manage risks (α = 0.91).

The mean value of factor 1 is 3.51 and standard deviation is 0.94. The mean value of factor 2 is 3.33 and standard deviation is 1.03. The mean value of factor 3 is 3.49 and standard deviation is 0.99. Factor 1 accounted for 49.78% of the variance, factor 2 accounted for 11.94% and factor 3 accounted for 7.60%. Overall, these three factors explained 69.32% of the total variance.

Comparative Tests

Independent samples t-tests were applied to three factors of impact on life scale and three factors of impact on future work and development as dependent variables and involvement in stocks and funds investment (yes versus no). For students who are willing to work in the derivatives industry (factor 2 of impact on future work and development scale), there is a statistically significant difference between students who invest Stocks & Funds (or not) where the significance value (p) is smaller than 0.05, as shown in *Table 3*.

In *Table 4,* the significance values are all smaller than 0.05 showing that there are some statistically significant differences regarding involvement in F&O investment (yes versus no). Students who are willing to work in the derivatives industry seem to be less interested in investment. Meanwhile, students which have higher mean value of these factors prefer not to invest, it can be inferred that students who learn F&O course well have lower willing to do the investment. Possibly, they aim to score high and do not want to distract themselves.

While computing the independent sample t-test towards the factors of impact on life or future work and development and gender. All the significant values (2-tailed) of the t-test are greater than 0.05, which means there is no significant difference between the impact of studying F&O course for male and female students.

Considering the knowledge level may have an impact on students, a one-way ANOVA was applied to the knowledge level with six factors in *Table 5*. Based on the Levene test results, the significance values of factors 1–3 of the impact on life and the factor "awareness of risks" are all higher than 0.05, which means Dunnett C post-hoc should be applied. The significance values of the other two factors of impact on future work and development are both smaller than 0.05 so the Tukey post-hoc test should be applied.

Results show that there is no difference between students in "bad" and "very bad" knowledge levels. Students who have "very good" knowledge are significantly different with the others. For most factors, there is no significant difference between "good" and "regular" levels. However, students who have a regular knowledge level seem to have more interest and are more willing to work in the derivatives industry.

Table 1

Factor Analysis for Questions about Impact on life (n = 534)

Question	*M*	*SD*	Factor 1 — 'F&O' is useful, (α = 0.90) seven items	Factor 2 — Sensitivity to market, (α = 0.92) five items	Factor 3 — Interest in the market, (α = 0.91) six items
1. I am proud that I took the 'F & O' course	3.67	1.17	0.802		
4. Overall, I found the 'F & O' course very useful	3.78	1.11	0.789		
17. I think 'F & O' course is important in the finance profession	3.69	1.13	0.788		
16. The study of 'F & O' course has improved my ability of independent thinking	3.56	1.13	0.734		
15. The course of 'F & O' enables me to analyze the trend of market development	3.46	1.17	0.725		
3. I think the learning curve for 'F & O' course is simple	3.35	1.20	0.661		
18. I was stressed when I took the 'F & O' course	3.49	1.17	0.647		
12. I dare to participate in financial market investment	3.45	1.21		0.805	
14. I have become sensitive to changes in commodity prices	3.34	1.20		0.804	
11. I can correlate changes in the prices of farm products with changes in the weather	3.38	1.13		0.789	
10. I am good at finding financial investment opportunities	3.33	1.18		0.788	
13. I think investing in farm products is as interesting as investing in stocks	3.43	1.20		0.762	
5. The study of 'F & O' course has given me more insights into common commodities in life	3.60	1.17	.		0.747
9. I think about the impact of news on financial markets	3.34	1.20			0.745
7. I find it strange when I haven't been following financial market information for a while	3.32	1.21			0.736
2. I can correctly view the market significance of 'F & O'	3.66	1.14			0.733
6. I am used to read about the financial markets every day	3.40	1.21			0.723
8. Following financial market information has become a part of my life	3.34	1.20			0.721

Source: Questions are adapted from Tinmaz and Lee [14].

Table 2

Factor Analysis for Questions about Impact on Future Work and Development (n = 534)

Questions	*M*	*SD*	Factor 1 — Awareness of risks (α = 0.92) seven items	Factor 2 — Willingness to work in the derivatives industry (α = 0.92) five items	Factor 3 — Ability of risk management (α = 0.91) five items
14. Risk management plays an obvious positive role in the development of enterprises	3.57	1.14	0.860		
11. Risk is important for personal growth	3.56	1.15	0.800		
12. Enterprises should actively participate in risk management	3.61	1.14	0.794		
16. Risk management enables business managers to make decisions with more confidence	3.55	1.14	0.786		
13. The high cost of risk management has an obvious negative impact on enterprises	3.40	1.13	0.767		
10. Risk is a good driver of market development	3.50	1.12	0.739		
15. In recent years, the global problems (pandemic, war, etc.) are conducive to the long-term development of enterprises	3.38	1.17	0.662		
5. Working in derivatives industry is my first choice for future development	3.24	1.20		0.843	
4. I am preparing for a job in derivatives	3.26	1.23		0.839	
2. I know something about the derivatives industry	3.33	1.19		0.808	
3. I would like to work in the derivatives industry	3.44	1.18		0.785	
1. I am interested in a job in the derivatives industry	3.37	1.18		0.765	
18. The study of 'F&O' course has made me have a long-term plan for my future development	3.55	1.16			0.819
19. The study of 'F&O' course makes me confident to deal with all kinds of sudden risk events	3.52	1.16			0.807
17. The study of 'F&O' course makes me more competitive in my work	3.58	1.15			0.788
9. I think risk is more positive than negative	3.48	1.15			0.767
8. I know how to avoid risk in the market	3.33	1.20			0.715

Source: Questions are adapted from Tinmaz and Lee [14].

Table 3

Differences between Investing Stocks & Funds in Relation to Factor

Demographic Question (IV)	Yes/No	n	M	SD	t	p
Willingness to work in the derivatives industry	Yes	305	3.44	0.95	–2.098	0.036
	No	229	3.61	0.92	–	–

Source: Adapted from Tinmaz & Lee [14].

Table 4

Differences between Investing Futures & Options in Relation to Factors

Demographic Questions (IVs)	Yes/No	n	M	SD	t	p
Study 'F & O' is useful	Yes	281	3.49	0.94	–2.028	0.043
	No	253	3.65	0.88	–	–
Willingness to work in the derivatives industry	Yes	281	3.39	0.94	–3.219	0.001
	No	253	3.65	0.92	–	–
Ability of risk management	Yes	281	3.39	1.04	–2.412	0.016
	No	253	3.60	0.93	–	–

Source: Adapted from Tinmaz & Lee [14].

DISCUSSIONS

In this paper, students majoring in finance in China were given a questionnaire about learning F&O lessons. In order to assess the learning effect and the impact of the students after the course study, two parts of questions about impact on life and future work and development are designed to learn about students. Gender difference, the experience of investing in stocks and funds, or F&O and the knowledge level were the independent variables in this research.

The student's willingness to engage in financial transactions and professional practice is at a relatively high level. In the F&O lessons, students are required to understand risk and master risk management skills with derivative tools. So that they could do analysis, risk recognition, and risk management while investing. The intention of students to invest is significantly influenced by the perceived risk [19]. Students majoring in finance can better understand and deal with risks after taking F&O course. Theoretically, they usually have a higher willingness to participate in the investment, using the professional skills and mindset they have learned.

However, investment seems to be burdensome stuff that assigns more work to students, as the results show. Students participating in investments seem to have a lower level of risk management ability. It is unfortunate that the purpose of educating students to invest has not been achieved. Students who do not participate in the investment may feel that this takes up time and affects learning. Participating students may hope to increase some income through investment, and the purpose of enhancing professional awareness is secondary.

There is no significant gender difference for students regarding the impact of studying F&O. Gender differences do not appear considering students' awareness of risks and ability to manage risks. The results here are somewhat different from expectations. Usually, the knowledge level of male students in this study is higher than that of female students. Garrison and Gutter [20] did a survey of 15,797 students from 15 universities and found similar results. Male students showed a greater willingness to take risks than female students because they thought they were aware of the risks and could manage them in their minds. The differences in this study may be related to relatively small gender differences in knowledge levels.

There are significant differences between knowledge levels and all other factors. It shows that how much students learn and master from the courses does influence their thinking mode. For students with a high level of knowledge, they pay more attention

Table 5

One-way ANOVA and Tukey post-hoc results for 'F & O' knowledge level

Factors	ANOVA		Tukey & Dunnett C post-hoc results
	F	p	
'F&O' is useful	16.344	.000	V.G > G, V.G > R, V.G > B, V.G > V. B, G > B, G > V. B, R > B, R > V. B.
Sensitivity to market	18.584	.000	V.G > G, V.G > R, V.G > B, V.G > V. B, G > B, G > V. B, R > B, R > V. B.
Interest in the market	16.004	.000	V.G > G, V.G > R, V.G > B, V.G > V. B, G > V. B, R > B, R > V. B.
Awareness of risks	15.022	.000	V.G > G, V.G > R, V.G > B, V.G > V. B, G > B, G > V. B, R > B, R > V. B.
Willingness to work in the derivatives industry	16.323	.000	V.G > G, V.G > B, V.G > V. B, R > G, R > B, R > V. B.
Ability of risk management	66.716	.000	V.G > G, V.G > R, V.G > B, V.G > V. B, G > B, G > V. B, R > B, R > V. B.

Source: Adapted from Tinmaz & Lee [14].

to market information, analyze it, and try to grasp potential investment opportunities. They also consider whether to continue to learn skills to enter related industries. Li [21] emphasized in her research that the level of teaching F&O has lots of effects on students' cognition and future development. The results of this study are consistent with this judgment. The change in thinking mode brought about by F&O education is of great significance and value.

According to the one-way ANOVA and post-hoc results, students who have a "very good" knowledge level have more belief and intention in all the factors. This can be understood as, in the learning process of the course, the judgment of the importance of the course and the level of cognition are not the core factors affecting the learning outcomes. Students with a better level of course learning will also have better risk management capabilities. This is the core purpose of the F&O course as a risk management derivative teaching course. It is the educational purpose of this course to equip the next generation of financial risk managers [22].

CONCLUSIONS

The design of the questionnaire is to understand the students' course learning situation, the impact of learning the course on their lives, future work choices, and future development, so as to judge whether the course can effectively help learners develop risk awareness. Researchers have obtained a series of results through a large amount of data analysis and will optimize and adjust the future education model and direction of the course based on the results. It is expected to gradually achieve and complete the purpose of applied education in financial theory courses. This research can also provide experience and a reference for educators with similar teaching purposes.

In terms of knowledge level, the mean value of male students is higher than that of female students. Then there is no significant difference between gender differences and other variables. Students may focus more on the market and become more sensitive to market information with a high knowledge. Unfortunately, those who participate in investment

pay less attention to the knowledge. Most students with lower awareness of risks and ability to manage risks participated in investing F&O. However, students with ability to manage risks and high knowledge levels are not interested in investing.

To conclude that, under the current practical and flexible teaching mode of F&O course, students with a higher level of knowledge under assessment can better master the ability of risk management and pay more attention to relevant investment information in life. However, under the establishment and transformation logic of the thinking mode, the risk awareness of students has not been significantly improved. These students are less engaged in investment practice. Gender differences do not need to be given too much attention under this educational model. Applied teaching, guiding students to participate more in the practice of professional skills is an effective teaching strategy that will continue to be implemented and expanded. In the process of establishing the thinking mode, the effect of the current teaching method is relatively general. There is also a need for more improvements in teaching methods.

The teaching method is still the focus in the establishment of the thinking mode. The method of combining the Internet and social comprehensive practice is also active and effective. In addition, each student, as an independent individual, understands the student's state and ideas, and more communication and inspiration will help guide and establish an effective ability. Continuous research is also very necessary. Future research can use interviews to understand the situation of students in a more targeted manner, provide feedback and guidance during the teaching process, and combine continuous participation and practice in professional practice events to achieve better results.

Implications for Practice and Future Research

The course teaching enables students to understand and recognize various risks in the financial market, including market risk, liquidity risk, credit risk, etc. Cultivating students' awareness of risk thinking will help them better identify, evaluate, and manage risks. Risk thinking awareness is very important for all types of decision-making. Through instruction, students learn how to factor risk into decision-making. They can learn to analyze and evaluate the risks and rewards of different options, so as to make more rational and prudent decisions. Teaching risk thinking awareness can help students develop a cautious and prudent work attitude, enabling them to adapt and deal with the risk challenges of life at work. For the macro market, the cultivation of risk awareness at the personal level has a certain contribution and value to the risk management level of the macro market and the improvement of market stability. Such research not only has a certain enlightenment significance for the education of financial professional courses, but also for the entire teaching system. The construction of thinking methods is very important, even more so than the matter of imparting knowledge itself.

In future teaching, gradually expand the knowledge boundary of related fields. Enrich the understanding of risk education and financial education and provide more guidance and references for educational practice.

The awareness of risk thinking brought about by studying F&O teaching can promote the development of related disciplines. Risk management and financial education are important subject areas. By studying the cultivation of risk thinking awareness, new ideas and methods can be provided for the theory and practice of these subjects. This helps to promote the innovation and progress of the discipline and provides more research fields and application directions for academics and practitioners.

Study Limitations and Delimitations

Concerning the limitations of this study, it takes Chinese students as the research subjects. In the teaching process of F&O course, teachers' teaching methods and students' learning and application abilities can only represent the teaching status. The goal of the research is also to optimize the teaching level of F&O course. This study can provide a reference for course teaching in similar institutions, but it is not suitable for the application of results and strategies. This research is based on the course study of students at one university, so the scale of the research object is limited. Improving students' risk awareness is one of the education focuses of F&O course. However, in the questionnaire survey, it is simple and direct to understand students' risk management tendency and willingness, but it is difficult to evaluate students' risk management ability.

As a result, students majoring in finance will study securities investment, securities asset management, portfolio management, futures and options, and other courses. During the course, students learn how to use financial instruments to complete investment and asset management activities. However, among this series of financial instruments, only derivatives courses take risk as a premise and teach students how to deal with risks [23]. That is the reason why this study focuses on students' learning and cognitive construction of F&O course.

ACKNOWLEDGMENTS

This research was sponsored by teaching research project "Teaching reform and practice of futures and options courses in applied undergraduate universities", Project No. 2022xj022. Finance School of Tongling University, Tongling, China.

Moreover, this research is funded by Woosong University Academic Research in 2024. Woosong University, Daejeon, South Korea.

БЛАГОДАРНОСТИ

Данное исследование было проведено при финансовой поддержке учебного исследовательского проекта «Преподавание реформы и практики курсов по фьючерсам и опционам в прикладных университетах для бакалавров», номер проекта: 2022xj022. Финансовая школа Университета Тонглинг, Тонглинг, Китай.

Кроме того, эта работа финансировалась Академическими исследованиями университета Вусонг в 2024 году. Университет Вусонг, Тэджон, Южная Корея.

REFERENCES

1. Hull J., Treepongkaruna S., Colwell D., Heaney R., Pitt D. Fundamentals of futures and options markets. Frenchs Forest, NSW: Pearson Higher Education AU; 2013. 566 p.
2. Refrigeri L., Aleandri G. The economics of education as educational science. *Procedia — Social and Behavioral Sciences*. 2014;116:2059–2063. DOI: 10.1016/j.sbspro.2014.01.519
3. Corsini L., Giannelli G.C. Economics education and financial literacy acquisition: Evidence from a field experiment. *Journal of Behavioral and Experimental Finance*. 2021;32:100556. DOI: 10.1016/j.jbef.2021.100556
4. Machin S. Developments in economics of education research. *Labour Economics*. 2014;30:13–19. DOI: 10.1016/j.labeco.2014.06.003
5. Self J.K., Becker W.E. Teaching and learning alternatives to a comparative advantage motivation for trade. *The American Economist*. 2016;61(2):178–190. DOI: 10.1177/0569434516652042
6. Hanushek E.A., Woessmann L. Do better schools lead to more growth? Cognitive skills, economic outcomes, and causation. *Journal of Economic Growth*. 2012;17(4):267–321. DOI: 10.1007/s10887-012-9081-x
7. Förster M., Happ R., Walstad W.B. Relations between young adults' knowledge and understanding, experiences, and information behavior in personal finance matters. *Empirical Research in Vocational Education and Training*. 2019;11:1–21. DOI: 10.1186/s40461-019-0077-z
8. Molina-García A., Cisneros-Ruiz A.J., López-Subires M.D., Diéguez-Soto J. How does financial literacy influence undergraduates' risk-taking propensity? *The International Journal of Management Education*.2023;21(3):100840. DOI: 10.1016/j.ijme.2023.100840
9. Bolton D., Galloway C. The holistic dilemma: Helping management students deal with risk. *The International Journal of Management Education*. 2014;12(2):55–67. DOI: 10.1016/j.ijme.2014.01.001
10. Hao J., He F., Liu-Chen B., Li Z. Price discovery and its determinants for the Chinese soybean options and futures markets. *Finance Research Letters.* 2021;40:101689. DOI: 10.1016/j.frl.2020.101689
11. Ma Z., Ma C., Wu Z. Closed-form analytical solutions for options on agricultural futures with seasonality and stochastic convenience yield. *Chaos, Solitons & Fractals*. 2020;137:109849. DOI: 10.1016/j.chaos.2020.109849
12. Diersen M.A., Wang Z. Trading commodity futures and options in a student-managed fund. *Applied Economics Teaching Resources*. 2022;4(1):1–11. DOI: 10.22004/ag.econ.320044
13. Massa O.I., Ramsey A.F. Student-managed commodity fund — a new frontier in experiential learning. *Journal of Agricultural and Applied Economics.* 2020;52(1):64–77. DOI: 10.1017/aae.2019.33
14. Tinmaz H., Lee J.H. General and instructional perceptions of South Korean messenger: 'KakaoTalk'. *International Journal of Learning and Change.* 2020;12(2):143–168. DOI: 10.1504/IJLC.2020.106715
15. Sürücü L., Maslakçi A. Validity and reliability in quantitative research. *Business & Management Studies: An International Journal.* 2020;8(3):2694–2726. DOI: 10.15295/bmij.v8i3.1540
16. Tavakol M., Dennick R. Making sense of Cronbach's alpha. *International Journal of Medical Education.* 2011;2:53–55. DOI: 10.5116/ijme.4dfb.8dfd
17. Shrestha N. Factor analysis as a tool for survey analysis. *American Journal of Applied Mathematics and Statistics.* 2021;9(1):4–11. DOI: 10.12691/ajams-9-1-2

18. Knekta E., Runyon C., Eddy S. One size doesn't fit all: Using factor analysis to gather validity evidence when using surveys in your research. *CBE — Life Sciences Education*. 2019;18(1): rm1. DOI: 10.1187/cbe.18-04-0064
19. Elfahmi R., Solikin I., Nugraha N. Model of student investment intention with financial knowledge as a predictor that moderated by financial selfefficacy and perceived risk. *Dinasti International Journal of Economics, Finance & Accounting*. 2020;1(1):165–175. DOI: 10.38035/dijefa.v1i1.232
20. Garrison S.T., Gutter M.S. 2010 outstanding AFCPE® conference paper: Gender differences in financial socialization and willingness to take financial risks. *Journal of Financial Counseling and Planning*. 2010;21(2):60–72.
21. Li J. The teaching research of futures and options course. In: 2021 2nd Asia-Pacific conference on image processing, electronics and computers (IPEC-2021). (Dalian, April 14–16, 2021). New York, NY: Association for Computing Machinery; 2021:1043–1046. DOI: 10.1145/3452446.3452695
22. Chance D.M., Brooks R. An introduction to derivatives and risk management. Andover: Cengage Learning; 2015. 640 p.
23. Adam-Müller A.F.A., Panaretou A. Risk management with options and futures under liquidity risk. *The Journal of Futures Markets*. 2009;29(4):297–318. DOI: 10.1002/fut.20362

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Conflicts of Interest Statement: The authors have no conflicts of interest to declare.
Конфликт интересов: авторы заявляют об отсутствии конфликта интересов.

The article was submitted on 27.02.2024; revised on 27.03.2024 and accepted for publication on 27.04.2024.
The authors read and approved the final version of the manuscript.
Статья поступила в редакцию 27.02.2024; после рецензирования 27.03.2024; принята к публикации 27.04.2024.
Авторы прочитали и одобрили окончательный вариант рукописи.