

Analysis of the Classroom Teaching Effects of Financial Engineering Based on Scenario Analysis

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Abstract

Financial Engineering is one of the important major courses of finance with the characteristics of strong theories, many difficult points, prominent professional feature and practical feature. This paper, based on the course characteristics of *Financial Engineering*, combines with years of experience of teachers, uses scenario analysis method to design classroom teaching, analyzes students' feelings and acceptance level of knowledge after the conduction of the designed teaching, and proposes suggestions on how to increase teachers' teaching experience and enhance their teaching quality.

Key words: Scenario analysis; *Financial Engineering*; Classroom teaching

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INTRODUCTION

With the development of China's economic and financial situation, the financial markets and financial institutions

are actively using financial innovation tools for market innovation. In 2010, China first launched financial futures exchange, which has opened the course of China's financial futures exchange. In February 2015, China's stock market started short sale mechanism and the two-way hedging mechanism in China's stock market has been improved and financial futures market innovation has climbed to a new level. The new situation of the development of the financial industry makes financial market demand for more specialized talents. As can be seen from the current staff recruitment tests in the financial sector, in professional skills tests, the requirements of graduates' theoretical level and knowledge level are increasingly high, especially in the understanding and application of knowledge related to financial derivatives. Students are required to have more pragmatic understanding of the development and exchange of financial derivatives.

Financial Engineering is one of the important major courses in finance. From the content system, *Financial Engineering* focuses on pricing and trading strategies structure of derivative financial products, and its foundations include the pricing process, basic trading rules and trading strategies of forwards, futures, swaps, options and other basic financial derivative products. Take Professor the book of Hull (1999) *Options, Futures and Other Derivative Products* for example. The content includes pricing and trading strategies of forward exchange contracts and the design and trading rules for futures contracts based on a variety of different properties. The famous Ito theorem and BS option pricing theory and various views of the global famed derivatives pricing theory gather in this book (Hull, 1999). This is a course requiring demonstration of financial theory, mathematical language description and trading practices and it has the characteristics of strong theories, many difficult points, more prominent major feature and practical feature. From the perspective of teachers, how to teacher well

of such a course is one of the issues worth exploring. This paper, based on such a course with strong theories, many difficult points and practical feature, combines with years of experience of teachers, use scenario analysis to design classroom teaching, analyzes students' feelings and acceptance of knowledge by comparing un-designed and designed teaching, and proposes suggestions on how to increase teaching experience and enhance teaching quality.

1. THE SITUATION DESIGN OF SOME CLASSROOM TEACHING IN *FINANCIAL ENGINEERING*

Situational Teaching Method refers to the method in which teachers in the teaching process purposefully introduce or create vivid and specific situations with a certain emotional color and themed with images to attract students' attitude experience and help students understand the materials and develop their mental function (Mi, 1990). Situational Teaching Method has developed many forms in its specific application. For example, for teaching content which is less vivid and more rigid, though it cannot be very vivid, situation design helps to understand the course. In theory, scenario simulation method is a kind of simulation training method derived from the case study method which is very practical and operational (Yuan & Duan, 2010). The scenario design of classroom teaching content of is a method aiming at teaching content to fragment the content and combining with students' acceptance level to design appropriate context to stimulate student interest in learning and improve the level of students' acceptance. We are going to use one of the contents in *Financial Engineering*, "stock index futures pricing", to analyze scenario analysis in classroom teaching.

Stock index futures are a kind of stock index-based financial derivative product. It is one of the exchange-trade futures within futures exchange and is an important financial derivative in the world and in the national financial markets. "Stock index futures pricing" is one of the contents that stock index futures need to focus on. The design of the teaching context around the theme includes the following components:

1.1 What Kind of Contract Is a Stock Index Futures Contract?

To fully introduce what kind of contract stock index futures contract is, we need to show which elements consists a stock index futures contract. Here we mainly introduce the contents of the underlying assets, the size of the contract and the delivery arrangements in a stock index futures contract.

1.2 How to Trade?

Any transaction must follow certain rules and so does stock index futures contract trade. Therefore, the key element

of this part is the trade rules to follow in stock index futures contract trades. The difficulty lies in understanding the margin rules and the application of the mandatory liquidation and lighten up and other risk systems.

1.3 What Is the Trade Price and How to Structure the Trading Strategy?

In "how to trade, what is the trade price and how to structure the trading strategy" part, the key point is the pricing of stock index futures contract and the index arbitrage as well as hedging strategies. First, we need to analyze the properties of stock index as stock index futures underlying assets. Second, we should consider the pricing of stock index futures contract and the selection of alternative variable. When we can price the stock index futures, we need to consider to index arbitrage or hedging strategies based on trading demand and trading purposes. All these contents need to be slowly comprehended step by step.

2. DESIGN OF CLASSROOM TEACHING PROCEDURES

According to the contents that need to be mastered in stock index futures pricing, the teacher designs the classroom teaching procedures. A teacher who has business experience in stock index futures designs his class in this way: first, he introduces examples and combines with Shanghai and Shenzhen 300 stock index futures stock and foreign markets' key index futures to analyze "what kind of contract stock index futures contract is"; second, he introduces exchange market events to analyze how to conduct "stock index futures contracts"; third, he combines with the market operating conditions to explain "stock index futures pricing theory" and Shanghai and Shenzhen 300 stock index futures pricing parameters, and sets the transaction demand, track the market and simulate trading strategies.

2.1 Introducing Examples in the Introduction Section of Stock Index Futures Contracts

The teacher tells a story of his personal experience with Shanghai and Shenzhen 300 stock index futures. The general content of the story is like this: In April 2014, after the continuous observation of the Shanghai and Shenzhen 300 stock index futures market, he decided to enter the stock index futures market to experience index operation and short sale mechanism. He went to the bank to ask for his credit history and applied for a bank card with 500,000 yuan. He went to the customer service department of Shanghai Central Financial Futures Co., read the *Futures Exchange Risk Manual*, signed a *Futures Brokerage Contract* and a series of other contracts, made the deposit payment of 130,000 yuan and received an account to exchange. A receptionist from the company told him that, on April 18, IF1412 contract would be

on the market, the hanging plate reference price of the contract is 2,190.8 points and 300 yuan per point. If you think that the market outlook would be bullish, or you do trading business to establish a buy positions. The handedly contract worth is 657,240 yuan, and the margin is 78,868.8 yuan. The last trading day of IF1412 contract is December 19, 2014. If you start the position now and it is not liquidated before the last trading day, it is necessary to deliver cash on this day...” When telling this story, the teacher clearly explains what kind of contract stock index futures contract is. To be simple, it means one needs to open a trading account in the futures company. Contracts with the code of “IF” are stock index futures contracts. Its value is calculated with “points” and “point multiplier”. In addition, the example also reveals the major professional arguments terms in stock index futures contracts such as transaction underlying, contract size, delivery month and so on. Apparently, the trading underlying of stock index futures contract is the CSI 300 stock index; the contract size is the number of points per hand multiplied by 300, which can both be held to maturity or may be intermediate position ... When demonstrating the contract table of CSI 300 stock index futures contract, it is very simple and intuitive to know what kind of contract stock index futures contract is.

2.2 Introducing Market Participants' Reflection to Explain the Relevant Trading System of Stock Index Futures

Then the teacher introduces a piece of news about stock index futures delivery and continues to tell the story participating in the Shanghai and Shenzhen 300 stock index futures trade. The news is like this:

With the approaching of the delivery date, the original long term parties will not be able to contract positions and have to use cash settlement. At 14:50 on December 15, 2014, 4 days from the delivery date, the Shanghai and Shenzhen 300 stock index futures point holds 3257.2 points and the returns for investor who have been holding IF1412 contract is 319,920 yuan. We can calculate that the maintenance margin is 87,944.4 yuan. Investors can withdraw cash 231,975.6 yuan. After the deduction of a number of transaction costs, the revenue is still very impressive...

The teacher uses the expression of returns to attract students' attention in the content design, and leads to the second part, “the main system design in stock index futures exchange”. The key system design includes deposit system, the system of price limits, position limits system, forced liquidation system, and forced lightening up the system, settlement guarantee fund system and risk warning system and so on. This case highlights the deposit system. When the teacher explains the search and use methods of the standard styles of various systems again, students will easily accept this part.

2.3 Thinking of the Critical Issues in Depth

In the explanation of futures trading system and the personal experience of CSI 300 stock index futures trading, the teachers emphasize two important pieces of information: One is the CSI 300 stock price index in the spot market and the other is the settlement in Shanghai and Shenzhen 300 futures contracts. With the two parts when and after the signing of the contract, he describes the determination of the intrinsic value of the futures contract and the determination of the delivery price. From the property point of view, the Shanghai and Shenzhen 300 stock price index is a weighted value of the index. From income point of view, under normal circumstances, it is equivalent to the dividend paid by a certain dividend yields. For such basic financial underlying assets, its pricing is similar to financial futures pricing based on the “paying known dividend yield securities”. Therefore, we can use replication technology construction portfolio strategy in the un-arbitrage theory rules to price Shanghai and Shenzhen 300 stock index futures. Based on the difference between the international financial markets and China's financial market development situation, we can select the appropriate parameters as possible and use market data to conduct pricing exercise. After completing the theoretical introduction, the teacher says that he did not do trading business and just wanted to conduct operating profits according to the price difference in the track of Shanghai and Shenzhen 300 index futures. This approach is index arbitrage.

This classroom design finishes the teaching of difficult theory when students get enough done. We can see in the teaching process, it is not a simple theoretical introduction or endless talk. The teacher uses his own business experience and it is truly the integration of theory and practice to enable students to complete learning in real mood.

3. ANALYSIS OF TEACHING EFFECTS

3.1 The Classroom Atmosphere Is Moderate

We can say that the pricing of stock index futures is a very difficult part. Its theory demonstration part requires students' knowledge foundation in mathematics and financial theoretical foundation. The pricing process requires students to have a certain level of good ability to use the software. Such content is not to tell a story. It can be very boring. However, the teacher combines his own business experience with the classroom teaching and such a design makes students concentrate. Almost all students have a pen in their hands. In the closely integration with the thinking of the teacher and the eye contact interaction, the course is completed. After class we conducted a survey for 75 students. 92% of the students think this course is attractive, very deep and very useful. 85% of the students say that they will continue to observe the operation of

the Shanghai and Shenzhen 300 stock index futures after the class, and also focus on the interest rate market and improvement work of the yield curve and continue to focus on amendments to the CSI 300 stock index futures pricing.

3.2 It Is Easier to Grasp the Key Points of the Theoretical Knowledge

A course contains a large number of knowledge points and all knowledge points link to the knowledge system of the course. In some courses, major knowledge is tightly coupled and some linking of the knowledge is loose. For courses in which knowledge is closely linked, how teachers foreshadow in their explanation and how they naturally link different and interconnected knowledge through them test the teaching level of teachers. In theoretical knowledge point system, if we can grasp the key points of the knowledge system, that will make teachers' lectures focused and neat. If we can integrate the key knowledge points into the practical experience, it will make it easier for students to grasp the key points of theoretical knowledge.

3.3 Making the Explanation of Profound Theory in Simple Terms

As a contemporary college student, when studying in school, only knowing facts is not perfect. Students need to know why. In the future when they go into the job posts, they need to adapt to the work as soon as possible and also have the crucial ability. Some people say that learning is a kind of wisdom and whether one can learn, can learn well, can use well is a requirement for contemporary college students to upgrade their ability. If one has the right attitude in the classroom, they can learn the knowledge well. If they seriously study and learn the theoretical courses well and use these in their work, they will become highly qualified graduates that the society needs. The teacher uses his own experience, uses scenario analysis method to actively arrange teaching content and explains in simple terms so that students can learn well in the classroom, in guiding students to apply the knowledge they have learned into practice. The students trained in

such a process will not be far from the community and they will be useful talent.

CONCLUSION

Financial Engineering is one of the important major courses for finance, with characteristics of strong theory, many difficult points, and prominent professional feature and practical feature. The teaching content of *Financial Engineering* is complicated, difficult and it is more difficult for students to accept. However, the current financial situation development has a high requirement for the quality of financial professionals. They need theoretical knowledge as well as business skills. In the classroom teaching in the absence of a simulation environment, studies to use scenario analysis teaching method can relatively increase the vividness of courses with strong theoretical feature and improve teaching effectiveness. This paper takes "stock index futures pricing" in *Financial Engineering* as an example, conducts a situational teaching design, and analyzes the effectiveness of teaching. Studies have shown that with the use of scenario analysis method in the classroom, students and teachers are closely linked in their thoughts; the classroom atmosphere is moderate rather than boring; the key points are focuses in the classroom teaching; the knowledge system is more coherent; the teacher explains the content in simple terms and it has achieved the desired effect of classroom teaching.

REFERENCES

- Hull, J. (1999). *Options, futures and other derivative products*. In T. W. Zhang (Trans.). Huaxia Publishing House.
- Mi, J. K. (1990). Theoretical exploration of situational teaching method. *Educational Research and Experiment*, (03), 24-28.
- Yuan, H. Y., & Duan, X. Z. (2010). The application of situational simulation method in administrative case teaching. *Education in Heilongjiang (Higher Educational Research and Evaluation)*, (04), 55-56.