

Problems and Countermeasures of Quantitative Investment Talents Training in Colleges and Universities

Peiying Quan ^a, Yaru Dong ^b

University of Jinan, Jinan 250000, China

^ass_quanpy@ujn.edu.cn, ^b1514761501@qq.com

Abstract. In the process of quantitative investment teaching, there are some problems, such as imperfect hardware facilities, short teaching schedule, lack of teachers, etc. The outstanding problems of students' quality need to be improved and the lack of funds for real transaction. Therefore, in order to do a good job in quantified investment teaching, we must have scientific teaching design, choose the best teaching content and software, strengthen horizontal cooperation, strengthen the training of teachers, and actively carry out the innovation of teaching methods.

Keywords: Quantitative Investment; teaching design; innovation.

1. Introduction

Quantitative investment is based on modern statistics and mathematical methods, and computer technology is used to transform investors' investment ideas into mathematical models, or to use models to simulate the real-world situation and then to judge market behavior or trends, and to make specific investment decisions and implementation by computer. Therefore, in the financial market, the use of quantitative investment strategy requires professional training. Quantitative investment teaching is an important link in training students to integrate theory with practice, shaping students' way of solving practical investment problems, strengthening students' investment strategy procedures, and realizing their ability and engineering concept. It has become the focus and difficulty of the teaching reform of financial specialty in Colleges and universities to study deeply and explore the effective ways and means to cultivate quantified investment talents. Therefore, how to integrate the existing financial teaching resources, through the design of experimental projects, make use of the advantages of case teaching and the reform of teaching assessment methods, and improve the teaching effect of quantitative investment, has become a prominent problem faced by the teaching design of financial specialty. This paper gives some opinions on this.

2. Characteristics of Quantitative Investment Model

Quantitative investment appeared in the 1960s abroad and developed rapidly in the last 10 years. Its development speed is far faster than traditional investment funds, and it has covered the main links of investment. Quantitative investment in China started late, and in 2004 quantitative investment products began to appear. However, due to the lack of effective hedging means and other reasons, it was not until April 2010 that Shanghai and Shenzhen 300 stock index futures were listed that quantitative investment was really involved. The robustness of quantitative investment funds and quantitative hedging strategy has attracted great attention in the market and become a product model sought after by banks, securities firms and trust institutions. Quantitative investment has the following remarkable characteristics:

(1) In the process of investment decision-making, the objective rationality of investment decision-making avoids the influence of human psychology in traditional investment analysis decision-making. It uses the mathematical model to analyze and test the relevant data in the historical and real market. Once the mathematical model passes the test and runs formally, the investment decision is handed over to the computer, and the artificial intervention is refused except for the special case. In this way, the emotional influence in the investment decision-making is minimized, and the whole investment process can be completed.

(2) Quantitative investment decision-making is efficient. Quantitative investment uses advanced computer technology to process massive data quickly and effectively, and identifies, analyses and finds out the correlation between these data so as to make investment decisions. It reduces the workload of people in investment decisions and greatly improves investment decisions.

(3) Quantitative Precision of investment decision-making is different from traditional investment decision-making. Quantitative investment can achieve precise investment. For example, in the process of stock index futures arbitrage, spot futures and stock index futures can carry out arbitrage if there is a big difference. Quantitative investment strategy and trading technology can make profits through timely and accurate capture of the best opportunity for arbitrage trading.

(4) Quantitative Investment decision-making is convenient and fast. The advantage of quantitative investment lies in the use of advanced high-speed computers and programmed transactions, which can discover the favorable information of the market faster than the human brain, and make corresponding processing. It has the characteristics of fast response. The advantages of this feature are most prominent in high-frequency trading. Unlike low-frequency trading, high-frequency trading uses advanced high-speed computer tools to quickly capture market opportunities and effectively complete transactions, which traditional investment methods can not achieve.

(5) Quantitative Investment decision-making can effectively control risks and obtain more stable returns. Relevant research shows that the information ratio of quantitative investment funds to traditional active investment funds and traditional active investment funds with emphasis on risk control is the highest between 1996 and 2005. It shows that quantitative investment can obtain higher excess return and control risk more effectively than traditional investment.

3. Outstanding Problems in Quantitative Investment Talents Training

With the development of quantitative investment practice, cultivating talents who meet the needs of quantitative investment has become an important and urgent issue for higher education in China, and has greatly stimulated the enthusiasm of universities for quantitative investment teaching. But the reality is that there are some problems in the teaching of quantitative investment.

(1) Hardware facilities are not perfect. Firstly, the construction of practice platform is lagging behind and it is difficult to meet the needs of teaching. Quantitative investment teaching, in addition to normal multimedia teaching conditions, also need to build a special financial training room, professional financial transactions multi-screen display system, quantitative trading software and equipment, a good trading network environment, enough students on the computer are indispensable. At present, most students do not have the opportunity to enter the practical teaching environment, which results in their lack of practical operation experience. Secondly, the school has not yet established a good horizontal association with securities companies and futures companies. It is difficult for students to use their complete sets of hardware and software to experience the real trading environment.

(2) Quantitative investment teaching has the characteristics of modularization, combination and advanced. It requires higher quality of teachers, especially practical ability. Teachers' quality has great influence on teaching effect. At present, there are many inadaptabilities among teachers. First, they lack practical experience. Second, the knowledge structure is not suitable. Third, they lack motivation. At present, many teachers lack the enthusiasm to improve the teaching of quantitative investment, which is more difficult than classroom teaching. The main basis for teachers to promote their professional titles is the amount of teaching hours and scientific research results, which leads to teachers' emphasis on theoretical research and lack of enthusiasm for practical teaching. In a word, in order to carry out quantitative investment teaching in Colleges and universities, teachers need to have certain trading experience and practical basis of quantitative transaction.

(3) The quality of students needs to be strengthened. At present, most of the students majoring in finance in Colleges and universities are directly admitted to universities after graduation from high schools. They have no contact with financial transactions, lack the basis of computer programming combined with data statistics, weak foundation of learning quantitative investment, and difficulty in

digesting, mastering and applying relevant teaching contents. In addition, the teaching progress is fast, and it is easy to produce the feeling of fear and boredom.

(4) Lack of practice as the only criterion to test the truth is the source of funds for real trading. Students can use quantitative transaction history data to verify their own ideas and understanding of the market, but for the majority of students, real trading is difficult to achieve, schools can not provide them with real trading principal, and they do not have personal funds in this regard.

4. Countermeasures and Suggestions

To cultivate a group of quantified investment talents with knowledge and ability, colleges and universities have a great responsibility. Efforts should be made to:

(1) The prominent feature of the courses involved in quantitative investment teaching with scientific instructional design is that they are comprehensive and practical, covering and integrating econometrics, mathematical modeling and simulation, computer advanced language programming, professional knowledge and operational skills, etc. The purpose of this arrangement is to enhance the specialty of finance. Comprehensive application ability of physiology theory to train innovative and practical talents to meet the practical needs of financial industry. Therefore, how to integrate the experimental resources of financial engineering specialty and give full play to its overall advantages relying on the curriculum construction of finance specialty and the hardware and software resources of financial specialty laboratory is the primary task of designing the experimental course of quantitative investment.

(2) There are many contents involved in the teaching of the best teaching content and software quantitative investment, so there is a choice problem. Generally speaking, the teaching content mainly includes four major topics: quantitative stock selection, quantitative timing, statistical arbitrage and procedural trading. In addition, it also includes the foreshadowing of financial investment theory and research tool software. The above teaching content involves three kinds of research tool software, real-time market and economic data services; data analysis; procedural trading.

Data analysis software can also be selected, such as SPSS, MATLAB, SAS, R and so on. SPSS is popular among users because of its powerful statistical analysis function and easy to master. MATLAB, SAS and R have unique advantages in training students in programming or other non-statistical analysis research methods such as neural network, which can be selected according to actual needs.

(3) In order to expand the channels of running schools and strengthen horizontal cooperation, starting from the principle of combining education with social practice, and aiming at the reality of insufficient quantified investment in teaching funds and less opportunities for students to operate on computers, schools should innovate ways of running schools, explore effective forms of cooperation among financial institutions in the field, and realize complementary advantages and benefit sharing. For example, in the construction of financial training room, financial institutions can undertake part of the hardware and software construction and teaching tasks. In reality, financial institutions have motivation and willingness to cooperate, and they have an urgent need for talent and technology. The school also has an urgent need, through cooperation with them, can quickly understand the market demand, timely teaching design, curriculum system adjustment; they can adopt the "order" training mode, schools according to the needs of employers to organize daily teaching, training applied talents.

(4) To strengthen the training of teachers and improve the level of teachers, it is essential to have a high-quality teaching staff to improve the teaching level of quantitative transactions. First of all, teachers themselves should pay attention to the continuous improvement of professional level and skills. This determines that teachers should learn modestly, and the important thing is to learn from practice. They should actively contact relevant financial institutions, fully grasp the market trend, constantly adjust and update the teaching content, and design a more reasonable simulation teaching process. Secondly, schools should vigorously support the professional teachers' further training, so that they can study in well-known foreign universities, in order to improve their grasp of the frontier level of subject teaching, broaden their horizons and enhance the world's vision. At the same time,

they will be supported to study in famous universities in China and attend academic conferences in order to improve their academic and teaching level.

(5) To actively carry out innovations in teaching methods, in view of the lack of sources of funds for real transaction, teachers and students can try to establish investment companies together. Students raise their own funds and invest part of their own funds in the form of equity. They imitate the structure of investment companies to establish investment decision-making departments, risk control departments, accounting departments and trading operation departments. They are managed according to the standard operating mechanism of companies, so that students can participate according to their interests and expertise.

5. Summary

In the process of quantitative investment teaching, we should adhere to the principle of keeping pace with the times, let students understand the social and economic situation and the development trend of financial market, take the market demand for investment talents as the guide, to achieve the purpose of highlighting professional characteristics and improving teaching level.

References

- [1]. Lihong Wang. On the Development Trend of Quantitative Investment and Its Enlightenment to China. *China Investment*. (2013) No. 9, p. 202.
- [2]. Chenyu Li, Sang Fu. Practical Teaching of Securities Investment Course in Local Applied Universities: An Empirical Analysis Based on CAPM Model. *Journal of Anshun University*. Vol. 18 (2016) No. 6, p. 58-61.
- [3]. Xiangbao Gao. Exploration on Innovative Teaching of Quantitative Investment. *Research and Exploration in Laboratory*. Vol. 35 (2016) No. 8, p. 281-284.
- [4]. Zhen Zhu. Exploration and Thought of Introducing Quantitative Investment Thought into the Teaching of Securities Investment Course. *China Securities Futures*. (2013) No. 5, p. 58.