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Discussion on the Training Scheme of Financial Mathematics Applied Talents with Financial Characteristics

Xia ZHANG

Shanxi University of Finance and Economics, Taiyuan, Shanxi 030000, China

ABSTRACT. At present, there is still a big gap between China's financial mathematics discipline construction and the international and domestic advanced level. It is necessary to adjust and transform the professional direction, reform and innovate the teaching plan, content and teaching materials, and extend and change the key direction of scientific research. Also, it needs the optimization and reorganization of teachers' knowledge and skills structure, the construction and expansion of industry university research cooperation platform, the transformation and update of experimental training software and hardware. This work aims to study the characteristics of financial mathematics. Based on the current situation of financial mathematics applied talents training in China, this work optimized its teaching system and teaching methods, constructed a multi-level and integrated talent training system, and created a first-class scientific research, teaching and practice environment. Consequently, the financial characteristics of personnel training efficiency has been comprehensively improved to promote the practical teaching development of financial mathematics in China.

KEYWORDS: Financial mathematics, Finance, Applied talents, Current situation, Training scheme

1. Introduction

Since 1996, the National Natural Science Foundation of China approved “research on several major issues of financial mathematics, financial engineering and financial management” as the “Ninth Five-Year Plan”. Financial mathematics, as an interdisciplinary subject, has risen and developed in China. Taking modern mathematics and computing technology as tools, it makes quantitative analysis of financial issues by establishing models, numerical calculation and theoretical analysis, thus revealing the inherent laws in the process of financial operation and guiding social practice. In order to adapt to the development of international situation and the urgent demand of the country for financial mathematics talents, various domestic colleges and universities have opened the financial mathematics course one after another [1]. However, due to the different training objectives and resource advantages in each school, the teaching contents of financial mathematics course are quite different, and the focus is inconsistent. Therefore, it is necessary to adjust and reform the teaching characteristics and students' development direction, thus improving the training effect of applied financial talents in colleges and universities [2].

2. The Teaching Content and Present Situation of Financial Mathematics in Colleges and Universities

2.1 Teaching Content

The teaching contents of finance course mainly include interest theory, financial derivatives (forward, futures, swaps and options), interest rate risk, term structure of interest rate, binary tree model, stochastic interest rate, etc. Through this course, students should be familiar with the basic methods of interest measurement, understand the difference between nominal interest rate and actual interest rate, calculate investment return rate by accounting, and construct debt repayment table. They should also master the value calculation and analysis methods of basic financial instruments such as bonds, forward, futures, swaps and options, manage interest rate risk by using duration and convexity, and be familiar with the term structure of interest rates.

2.2 Teaching Situation

At the present stage, the teaching content of financial mathematics in colleges and universities in China lags behind obviously and is not closely connected with the practical issues around us. For example, the popular annualized yield calculation method of Yu'ebao and other monetary funds, hedging with futures and the controversial operation methods

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of stock index futures are not reflected in the teaching content. At the same time, the practical operation knowledge in the teaching content is also very little, which affects the cultivation of students' ability to solve practical financial problems in the course of financial mathematics.

At present, the teaching mode of financial mathematics course still adopts the traditional way of knowledge indoctrination, which emphasizes knowledge explanation and ignores skill training. In the teaching process, the teacher mainly derives the formula and explains the economic meaning of the model, which makes the teaching process of the course very similar to that of the mathematics course. There is no corresponding case to support, and students are not exposed to a large number of financial cases to support the analysis. Also, they have not received systematic practical skills training and field training, nor have they been exposed to relevant software and operations. The teaching method makes students' cognition of what they have learned only stays on the surface of theoretical knowledge such as definitions and formulas in textbooks. Therefore, they can't use the pricing method and analysis technology to explore various financial issues.

The characteristic of financial mathematics course is application, which focuses on training students to think and deal with some practical financial issues. The practical financial issues need a lot of time to think and consult information, and also need to use relevant software and programming calculation. At this stage, the financial mathematics teaching in colleges and universities obviously does not do a good job in the construction of the application and practice system, and there are many deficiencies in the cultivation of students' ability.

3. Reflections on the Training Scheme of Financial Mathematics Applied Talents with Financial Characteristics

3.1 Overall Thinking

In order to cultivate applied financial mathematics talents in line with the market requirements, colleges and universities in China must adhere to the market demand as the basis, and establish the applied personnel training mode with the employment as the guidance and the ability and quality improvement as the core. It is also necessary to pay attention to the interdisciplinary, the connection between theory and practice, and the cultivation of practical ability.

(1)Focusing on professional construction quality engineering. It is necessary to adhere to the principle of stable development for students. It does not ask for quantity, but strives for quality, thus forming the high quality applied finance and economics characteristic talented person troop which conforms to the market development demand.

(2)Taking the construction of financial mathematics characteristics as the core. The characteristics of financial mathematics should be focused on “the training of computational and experimental financial talents”, and this characteristic construction should be run through all aspects of professional construction, and knowledge integration should be realized in the interdisciplinary.

(3)Taking the actual needs of the financial industry as the guidance. It should strengthen the connection with the financial industry, and cultivate students' practical skills such as software application, financial calculation and simulation based on the practical application of financial mathematics in the financial industry.

3.2 Training Program

3.2.1 Firmly Establishing the Educational and Teaching Concept Suitable for the Cultivation of Applied Talents

Colleges and universities should firmly establish the education and teaching concept suitable for the cultivation of applied talents, and firmly establish the education and teaching concept of “quality education, three creation education, lifelong education and learning for application”. For the orientation of applied financial and economic personnel training, it should build an educational and teaching system featuring value orientation, application of personnel specifications, complexity of curriculum design and practicality of training process [3]. It is necessary to explore the theory and practice of applied undergraduate education in combination with the characteristics and requirements of applied talents training, and construct the applied undergraduate education with application as the main line and ability as the core. It is an applied financial talent training system that combines academic education with vocational quality education, and aims to cultivate high-level specialized talents with solid foundation, good quality, strong ability and sufficient stamina in production, construction, service and management.

3.2.2 Constructing the Curriculum System Suitable for the Cultivation of Applied Financial and Economic Talents

Colleges and universities can build a reasonable course module or course group in the way of “platform + module”. The system is divided into general education platform, discipline foundation platform, professional foundation platform,

professional development platform and practice innovation platform. In the professional development platform, it sets up computer ability module, financial theory ability module, actuarial ability module, investment analysis and management ability module, financial accounting and analysis ability module, financial statistics ability module, financial financing ability module, etc., combined with the ability requirements of employment posts. Each ability module is supported by 3-5 core courses, so that students can better and faster adapt to the job requirements in employment.

At the same time, special courses should be set up according to the characteristics of financial mathematics major, such as extracurricular scientific and technological activities, subject competitions, skills competitions, etc. According to the training objectives and specifications of application-oriented talents, it should continue to strengthen school local cooperation, or invite local enterprises such as banks, securities investment companies, insurance companies and other executives to participate in the construction of the curriculum system. Based on the requirements of enterprise posts, it should innovate the curriculum system, integrate the teaching content, and strive to build a curriculum system with professional and local characteristics that is suitable for the local economic and social development.

3.2.3 Strengthening Practical Teaching Links and Training Students' Practical Ability

Colleges and universities should advocate diversified teaching organization forms and adopt participatory teaching according to teaching contents. The teaching methods such as heuristic, inquiry, discussion, etc., should be adopted, especially the daily and whole process subject competition and task driven mode should be adopted. It is of great significance for the cultivation of students' knowledge and ability to make classroom teaching change from teacher driven to task driven, comprehensively enhance students' subjective initiative, and enable students to participate, explore independently and cooperate in the learning process.

On the other hand, colleges and universities should also pay attention to the combination of production, teaching and research, experiment, training, probation and practice, and the combination of decentralization and concentration. It is necessary to construct three aspects of practical teaching: basic practice, professional practice and comprehensive practice [4]. The specific projects and arrangements of seven links on course experiment, enterprise internship, enterprise practice, curriculum design, graduation practice, graduation thesis and social practice are detailed, and the cultivation of application ability is strengthened. At the same time, it emphasizes the combination of experiment and practice teaching with teachers' scientific research projects, production and life practice, and extracurricular scientific and technological activities, thus cultivating students' innovative spirit and practical ability, and encouraging students' individualized development.

In the above-mentioned process, it should pay attention to selecting high-quality financial companies and local banks as practice teaching bases, and arrange students to carry out internship and practice activities in these companies. Also, company executives should be hired to give lectures and lectures to students, or even to build a cooperative base with them. This can not only improve and strengthen the ability of financial mathematics major to serve the local community, but also ensure the quality of students' practice activities.

4. Conclusion

The training mode of applied talents in financial mathematics should be based on the market demand, oriented by employment and centered on the improvement of ability and quality. It is not only the internal requirement of cultivating high-quality applied financial talents with harmonious development of knowledge, ability and quality, but also the objective need to adapt to China's economic development. The fundamental purpose of financial mathematics curriculum reform in China's colleges and universities is to improve the teaching quality and cultivate innovative and applied talents with financial characteristics. In the teaching process, teachers should take the cultivation of students' application ability and innovation ability as the goal, change the traditional teaching concept, improve the teaching content, actively explore and innovate teaching methods, and constantly improve and develop the curriculum teaching reform. This allows the financial mathematics course to play a greater role in the training of applied talents, thus offering fresh blood and high-quality resources for the development of China's financial field.

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