Discussion on the Application of Economic Mathematics in Financial Economic Analysis

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[Abstract] With the continuous development of the world's financial economy, the financial system presents a certain complexity. The traditional economic qualitative analysis method can no longer meet the needs of the development of financial economy. Under this background, economic mathematics combining quantitative and qualitative analysis are gradually widely used in the modern financial economy. It has played a very important role in researching and solving problems in the financial economy. This paper introduces some important theoretical applications of economic mathematics in the financial economy at present, analyzes the shortcomings of mathematical economic analysis, and proposes some measures to optimize economic mathematical analysis. It is hoped that it will have a reference role in the analysis of financial economy.

[Keywords] Economic mathematics; Financial economy; Application; Optimization

1. Introduction

The application of economic mathematics in financial economic analysis has been very extensive. Using economic mathematics theory such as differential equations, functions, derivatives and limit theory to the research and analysis of economic phenomena, the complex economic relations can be calculated in the form of mathematical formulas, thus effectively solving the financial economic analysis. Many of the problems continue to promote the development of the financial economy. Therefore, economic mathematics plays a very important role in financial economic analysis. At present, the mathematical economic analysis has certain drawbacks. The analyst should grasp the authenticity and reliability of the data in a rigorous attitude of the mathematics discipline to ensure the scientificity of the economic analysis results.

2. The Application of Economic Mathematics in Financial Economic Analysis

2.1 Application of Function Model in Financial Economy

Function is a basic knowledge point in mathematical theory. It is often necessary to establish a corresponding functional relationship when using mathematical methods to study financial economy. The relationship between functions is used to analyze problems in economic phenomena and to solve real economic problems. For example,

when we study the relationship between supply and demand under the market economy system, we use the relevant theory of economic mathematics to use the function model to establish the corresponding functional relationship between supply and demand. The calculated results can effectively explain the supply and demand relationship in a certain stage of the market.[1] On the one hand, when the supply function is used as the dependent variable, the supply will increase as the price of the product increases, and the demand will decrease. On the other hand, the demand function can also be used as the dependent variable. In the market economy, there are economic laws indicating that value determines the price and the price affects the sales volume. We can use this function relationship to find the balance point of market supply and demand, and provide a basis for economic decision-making, thus promoting the development of financial economy.

2.2 The Application of Limit Theory in the Financial Economy

The limit theory is the core of economic mathematics and the basis of many mathematical theory concepts. In modern financial economic analysis, limit theory is often used.[2] The important role of the limit theory is mainly reflected in the development and reduction laws that can reflect things, such as cell growth fission, population growth and decline, species growth and reduction. The application of the limit theory in the financial economy is mainly reflected in the fields of financial investment management, such as the use of limit theory to calculate and count the compound interest and annuity of bank deposits.

2.3 Application of Derivatives in Financial Economy

Derivative theory, as one of the commonly used theories in mathematics, is also widely used in financial economic analysis. Economic budgets are established through economic models in economic activities, such as marginal demand functions, marginal cost functions, marginal revenue functions, etc. These functions are calculated in the form of derivatives, which convert the variables in economic activities into constants, thereby calculating the minimum cost required to carry out the corresponding economic activities, and helping the enterprise to choose the optimal development plan. On the other hand, the derivative is also needed when conducting the elasticity study of economic activities. It can be used to calculate the relationship between supply and demand of products, thus providing a basis for pricing.

2.4 The Application of Differential Equations in Financial Economy

A differential equation is a relational equation containing differentials, independent

variables, and unknown functions. The financial economy is a process of constant change.[3] Many times we cannot directly see the changing laws. These transformations often contain two interrelated factors: independent and dependent. The relationship between the independent variable and the dependent variable cannot be directly seen, and a differential equation is established by the functional relationship between the two. An independent variable can be assumed to be a constant first, and then a conventional mathematical calculation is performed, and finally a conclusion is drawn. Therefore, the application of differential equations to financial economic analysis is conducive to solving many complex problems encountered in financial economic analysis.

3. The Shortcomings of Mathematical Economic Analysis

3.1 Lack of Certainty in Data Sources

In the process of using economic mathematics to analyze the financial economy, because economic activities are constantly changing, the data we acquire at a certain stage often fails over time. Economic mathematics calculations based on these failed data are directly affected. Based on the rigor of mathematics, the error of a certain data will lead to the scientific result of the overall operation result, which makes the result of economic analysis lack effectiveness and has a negative impact on economic decision-making.

3.2 Analysis of Economic Activities Lacks Comprehensive Consideration

In the ever-changing market economy, the factors affecting economic phenomena are numerous and complex, including internal and external factors.[4] The analysis of economic phenomena from the data alone sometimes fails to reflect the laws of the entire economic activity, resulting in the lack of scientific prediction of results. It is not conducive to us to better understand the economic market. Therefore, when applying economic mathematics to analyze financial economy, we should comprehensively consider various influencing factors so as to improve the scientificity of the results.

4. Measures to Optimize Mathematical Economic Analysis

4.1 Ensure the Accuracy and Timeliness of Data Sources

The source of data in the market economy is very wide, and there are many channels for obtaining data. In order to ensure the reliability of the data, the source of the data should be fully verified when extracting data. It is necessary to obtain data from

formal channels, select authoritative ways, and conduct research in all aspects to screen out and update data in time to ensure the authenticity of the data. Only by ensuring the true reliability of the data can the mathematical analysis method play its due role and improve the scientific prediction of the results of economic activities.

4.2 Comprehensive Consideration of the Analysis of Economic Activities

When analyzing economic activities, we cannot rely solely on data as a basis. There are still many factors influencing economic phenomena. For example, the development law of the market economy itself and the macroeconomic regulation and control of the government may all be the causes of certain economic phenomena. Therefore, in order to improve the reliability of financial economic analysis, it is necessary to comprehensively consider the influencing factors of economic phenomena. For example, analyzing the causes of inflation in a certain region cannot be studied only from the perspective of supply and demand. It should also be combined with the cost of goods and future development trends, and these factors should be reflected in the form of data. Then use mathematical analysis to calculate and verify, and provide a basis for solving practical problems. Therefore, through comprehensive consideration of economic phenomena analysis and research, economic decision-making can be made more scientific and effective, and promote the healthy development of the financial economy.

5. New Development Direction

OR illustrates the new trend of the macroeconomic model of the open economy, which is randomly developed.[5] They notice that in the international financial economy of many currencies, the possibility of price rigidity is relatively large in the closed economy of pure currency. The division of the domestic economic market is quite necessary. It feels that, the past problems of currency pricing in the region or currency pricing in other countries are somewhat similar to the reality. The truth is that the total data indicated by the evidence may be consistent with the previous research structure. Exports are mainly priced in the currency of their own country. The nominal exchange rate changes have an important short-term effect on international financial competition and economic trade.

Firstly, the price detachment is mainly because the part of the customer price index is not collateral. The separation of the market and the standard of the local currency price indicate that the detachment pricing standard is not clear. Secondly, the price stickiness caused by income stickiness may be more important in explaining the successive changes in the macro economy. This is because the pricing of the transaction will not cause most of the lasting detachment. Moreover, the direct

evidence of the price and the currency price of the importing party using the importing party are different. Finally, the international proof of the gap between price and input and the practice of using the exporter's currency price remain unchanged. Pricing for all products is floating. It gives an equilibrium method with an early determination of income and a valid answer, and a closed-loop solution for each intrinsic variable.

6. Conclusion

All in all, with the continuous development of the economy, the factors affecting the development of the financial economy are becoming more and more complicated, and the traditional simple economic analysis methods can no longer meet the development of the times. Using a variety of theories involved in economic mathematics to present in a formula is possible to simplify a variety of complex economic problems and solve economic problems in real life. Analysts should strive to overcome the shortcomings of economic mathematical analysis, obtain data with rigorous attitude, ensure the reliability of data, make the analysis results play the biggest role, and promote the development of economic construction.

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