Significance and Necessity of Applied Advanced Mathematics in Economic Field

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ABSTRACT: Advanced mathematics has a wide range of applications in people's daily life, especially in the economic field. It can meet the needs of economic development at the current stage and is very beneficial for promoting the economic health and stable development. Based on this, the development of applied mathematics in the economic field is discussed. History, the significance and necessity of applying advanced mathematics in the economic field, the role of advanced mathematics in the economic field, the application of advanced mathematics in the economic field, and other key issues, will play a very important role in the healthy and stable development of our country's economy.
KEYWORDS:: Economic Field; Advanced Mathematics; Application.

I. INTRODUCTION

Mathematics is closely related to people's work and life, and its importance has been realized by more and more people. Especially in the economic field, people can use mathematics as an indispensable tool to simplify some complex problems and solve the problems in the economic field quickly and efficiently. Therefore, the application of advanced mathematics in the economic field has important practical significance.

II. THE DEVELOPMENT PROCESS OF APPLIED ADVANCED MATHEMATICS IN THE ECONOMIC FIELD

As early as the late 17th century, related scholars briefly analyzed the role of mathematical knowledge in the economic field and political events in Political Arithmetic. There is a certain skepticism in the field, and the application of this period is difficult to play a real role. But with the passage of time and the progress of science, more and more scientists have begun to study the relationship between the two and apply mathematical knowledge to the economic field.

According to research, most of the economists who have won the Nobel Prize in Economics are outstanding mathematicians, from which we can see that mathematics has made great contributions to economic development. The important role of mathematical theoretical knowledge in economic development has been recognized by more and more entrepreneurs and economists, who can better apply advanced mathematics to the economic field.

III. THE SIGNIFICANCE AND NECESSITY OF APPLIED ADVANCED MATHEMATICS IN THE ECONOMIC FIELD

1. The significance of applied advanced mathematics in the field of economics

With the continuous development and progress of the economy, the development of economics has become inseparable from mathematics. Many concepts and contents in economics need to be defined and explained by using the theoretical knowledge of advanced mathematics. Mathematics provides the development of economics. Problem-solving ideas and methods. At present, economic models are mainly constructed through advanced mathematics, which can accurately analyze the complex relationship between various economic variables from the perspective of advanced mathematics theory, and make scientific and reasonable explanations, which can guide economic construction scientifically.

2. The necessity of applying advanced mathematics in the economic field

The advanced mathematical theory has very strict logical reasoning, and when it is applied to the research process of the economic situation, authoritative assumptions can be made and new theories can be derived. Therefore, its application is scientific and necessary. Statistical theory in advanced mathematics plays a very important role in data statistics in the economic field, which can

realize the ordering of a large number of statistical data, and greatly improve statistical efficiency and accuracy. Statistical work in economic fields such as population census, product sales, and payroll accounting can all be completed through statistical theory in advanced mathematics, and problems in economic fields such as calculating institutional interest and industrial profits can also be solved through advanced mathematics. There are many such examples, and I will not list them all here. It can be seen that mathematics promotes the development of economics, and the development of economics is inseparable from mathematics.

IV. THE ROLE OF ADVANCED MATHEMATICS IN THE ECONOMIC FIELD

The role of advanced mathematics in the economic field is mainly instrumental and ideological.

1. Instrumental role

Mathematical concepts are abstract and have an instrumental role in the economic field, and some problems in economics can be described very clearly using mathematical language. Mathematical theories are highly logical, and through rigorous logical reasoning, the probability of errors is greatly reduced, so that assumptions are more authoritative and new economic theories can be derived. In the economic field, many problems are intricate and the factors are changeable, and advanced mathematics can provide mathematical models to simplify complex problems and make problems simple and organized.

2. The role of thought

As a research method and method, the role of advanced mathematics in the economic field is also reflected in the ideological aspect. The rigorous thinking of advanced mathematics runs through the basic characteristics of economics and promotes the formation and development of economic theory. Western economics is the basic theory used to describe the operation of the market economy, which is very important for us to study and study economics. Mathematical is the most prominent feature of its logical reasoning and way of thinking. Therefore, economics and natural sciences, as social science disciplines, are considered to be the closest in terms of research methods and theoretical forms. Verifiability is an important criterion for judging whether a hypothesis or theory is scientific, and the discipline of economics is scientific, rigorous, and can be falsified. Established economic theories can be verified by establishing corresponding mathematical models, and when there are

deviations, mathematical methods and ideas can be used to revise them to make them scientific.

V. THE APPLICATION OF ADVANCED MATHEMATICS IN THE FIELD OF ECONOMICS

The application fields of advanced mathematics are very wide, especially in the economic field. The application of advanced mathematics promotes the development of economics, and the development of economics cannot be separated from the application of advanced mathematics.

1. Function knowledge, the application of limited knowledge

In economic management, the economic forecast as the basic work directly affects the development of the economy. Therefore, in economic management, very important work content is to use advanced mathematical theory to analyze the corresponding economic trend. Therefore, in economic management, the application of advanced mathematical knowledge is particularly important. When applying advanced mathematical knowledge to solve economic problems, it is necessary to establish mathematical models corresponding to economic problems, so as to transform economic problems into corresponding mathematical problems. In economics and mathematics, the steps for establishing a functional relationship are the same. To link two variables in a function, one or several intermediate variables may be required. In economic forecasting, the knowledge in advanced mathematics that needs to be used includes functions and limits, such as population growth, the relationship between supply and demand of goods, etc., which can be solved by analyzing function graphs. Today, e-commerce is developing rapidly, and the network economy has also achieved rapid development with the help of highly developed information and communication platforms, but these are inseparable from advanced mathematical theory. The realization and continuous improvement of fingerprint identification technology and call queuing technology also rely on rigorous logical analysis in advanced mathematics.

2. Application of Differential Equations

Differential equations are an important branch of advanced mathematics. They have a very complete theoretical system. Their models have the characteristics of validity and universality and can provide sufficient analysis data and solving methods. They are widely used in the economic

field, such as population statistics. academic issues, economic growth issues, etc.

The relationship and change law between quantities in these problems cannot be directly expressed by functions. The knowledge of differential equations can be used to establish corresponding differential equation models according to the known conditions and actual conditions in the problem. When it is necessary to partially reflect the overall economic problems, such as commodity inventory, random sampling, testing, etc., the relevant knowledge of probability theory can be used for estimation.

3. Application of the maximum (minimum) value of the function

"Lowest cost", "maximum profit" and "highest benefit" are frequently encountered problems in the economic field. Similar problems can be transformed into the maximum (minimum) value of the objective function in mathematics by applying advanced mathematical knowledge. Another example is the investment behavior in economic activities, such as purchasing equipment or other investments, etc., the series knowledge in advanced mathematics can be applied to convert all the costs of investment activities into numerical values and the accumulation of all investment costs in the activity cycle, and the output ratio of investment activities can be estimated, so as to provide scientific guidance for investment behavior and save costs for enterprises.

4. Applications of multivariate calculus and linear algebra

Other branches of advanced mathematics are also widely used in the economic field, such as regression analysis, optimal allocation of resources, and other problems, which can be solved by multivariate calculus, a branch of advanced mathematics; problems such as linear programming and input-output can be solved by linear algebra, a branch of advanced mathematics. Of course, there are many other applications of advanced mathematics and its branches in the economic field, such as the application of derivatives in marginal problems, etc., which are not listed here.

VI. CONCLUSION

To sum up, we can see that the application of advanced mathematical theory knowledge in the economic field is very extensive, which is of great significance and necessity. It can simplify and mathematical complex economic problems, and make problems in the economic field more timely, to be solved more efficiently. Entrepreneurs and scholars should explore the application of advanced mathematical knowledge in the economic field

more deeply, so as to promote the healthy and sound development of the market economy.

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