Applications Analysis of Short-term Statistical Forecasting of Macroeconomic Data

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Abstract: With the development of macroeconomic theory, macroeconomic forecasting has become an important aspect of empirical analysis. The core idea of short-term macroeconomic forecasting method is to discover the inherent law of statistical data through specific methods and technologies, and use this law to predict the future. This paper analyses the characteristics of macroeconomic data and gives application examples of short-term statistical forecasting of macroeconomic data. We suggest Establishing Index System, Enhancing Elasticity Prediction and Making Full Use of Big Data to obtain relatively accurate prediction of macroeconomic data.

1. Introduction

For a long time, governments have attached great importance to the collection and processing of macroeconomic data to make decisions and choices on the strategies and means of macroeconomic regulation and regulation [1]. This has solved the market failure in economic operation to a great extent and scope, and solved many problems that market mechanism is difficult or even impossible to solve. Constantly improving and perfecting the market economic system has put forward higher and higher requirements for government departments to carry out macroeconomic research, and relevant policy makers are increasingly relying on macroeconomic research and macroeconomic monitoring and forecasting in policy formulation. On this basis, macroeconomic monitoring and forecasting has developed rapidly. In order to effectively solve the problem of information islands in macroeconomic research and realize the sharing and transmission of macro-data through a unified access interface, it is necessary to further strengthen the effective integration of macro-data and effectively strengthen the application integration and data sharing of databases among relevant economic departments. Strengthening the optimization and integration of data resources has become the key link of macroeconomic monitoring and forecasting system. Achieving macroeconomic data sharing can not only greatly reduce the cost of data collation and integration, reduce the time of data collection, but also enable more macroeconomic data analysts to obtain economic data, realize data sharing, and improve the efficiency and efficiency of data use. In the process of implementing macroeconomic monitoring and forecasting system, it is difficult to achieve data integration and data sharing. It is feasible to make short-term prediction through macroeconomic data [2].

2. Features of Macroeconomic Data

Macroeconomic data are basically from various government authorities. Because the departments are independent of each other, the information systems are developed to meet their own management needs, and the compatibility between the systems is relatively small [3]. There are many differences in data format and structure.

Specifically, macroeconomic data have the following characteristics. First, autonomy. This mainly refers to the integration of data in the macroeconomic monitoring and forecasting system will involve multiple departments. The information systems and databases used by these departments are independent of each other, and there is no data sharing and data association between them. At the same time, the original information systems used by various departments cannot be affected by data

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integration in the macroeconomic monitoring and forecasting system, which requires that the system construction should ensure that each system has autonomy in data management. Secondly, heterogeneity. This mainly refers to the macroeconomic monitoring and forecasting system involves many departments, each department is around their own needs for system development, so the database version and application system are very different, data stored in different databases, which will lead to economic data in terms of structure and form are very different, making economic data. It has the characteristics of heterogeneity. Third, incompleteness. For the construction of the macroeconomic monitoring and forecasting system, the amount of data needed is relatively large, and the data comes from different management departments, which are independent of each other. The data are stored in different database management systems. No management department can provide all the macroeconomic data completely. As far as the macroeconomic data of specific departments are concerned, there is no end to end. The characteristics of integrity. Fourth, distribution. Distributive characteristics refer to the distributed structure of the data sources faced by the macroeconomic monitoring and forecasting system in data integration. The macroeconomic data of various economic departments are independent and dispersed, and stored in different database systems [4].

3. Application Examples of Short-term Statistical Forecasting of Macroeconomic Data

3.1 Supply Side Forecasting.

From the supply side, the first industry mainly inspects agricultural production indicators such as crop acreage and sowing conditions, as well as animal husbandry output indicators such as pig, cattle, sheep and poultry output. Its leading indicators are climate change, international grain prices and inventory cycle. The second industry mainly investigates industrial added value and output of major industrial products, and its leading indicators are mainly manufacturing purchasing managers. Number, new order index, industrial fixed assets investment, productivity utilization ratio, industrial power consumption, bank credit investment and social financing scale change; the tertiary industry mainly inspects value added, consumer expenditure and real estate development indicators, its leading indicators are resident's income, consumption tendency, new housing construction area, land acquisition area and bank credit investment. Through the monitoring of the above leading indicators, we can effectively predict the growth trend of the three major industries in the short term, and judge the macroeconomic trend from the level of total supply. The old pillar industries are declining, while the new strategic industries are flourishing, but their dominance and traction have not been fully exerted; the old economic growth point is weakening after many years of playing its role, and the new economic growth point Xiao Lou is showing its sharp edge. Once the momentum of development fails, the economy may stall. The tertiary industry accounts for more than the secondary industry, and the economy presents a service-oriented trend. The employment absorptive capacity of economic growth has been improved, and the pattern of medium-low-speed growth and high employment has emerged. With the rapid development of small and medium-sized enterprises and the accelerated development of emerging industries, the income gap between urban and rural areas has narrowed and the relationship between urban and rural areas has become more coordinated. At present, China's economic operation still faces many difficulties and challenges. The downward pressure of the economy is greater, the pains of structural adjustment appear, and some economic risks appear.

3.2 Demand Side Forecasting.

From the demand side, consumption mainly examines retail sales of consumer goods and consumer expenditure, and its leading indicators include employment, income of residents, consumer confidence, etc. Investment mainly examines total investment, real estate development investment and infrastructure construction investment. Its leading indicators include bank credit growth, new construction projects, land acquisition area and related investment policies. The main indicators of export include cargo throughput of coastal ports, Baltic Dry Bulk Index, exchange rate fluctuation, PMI new export order index, consumer confidence and retail growth rate of major trading countries, export rebate policy, etc. Through the monitoring of the above leading indicators, we can make a

short-term forecast of the changing trend of the "troika" of the national economy, and then study the macroeconomic changing trend from the demand level. Price level is also an important aspect of monitoring macroeconomic operation. The main indicators are consumer price level, ex-factory price index of industrial producers, purchase price index and real estate price index. The leading indicators to observe price level changes include domestic economy, monetary credit and investment growth, food and energy price changes, international crude oil, iron ore and non-ferrous metals and other commodity price indices. We can use the search index of Baidu search engine to build CPI public opinion index to help predict CPI. This paper studies CPI of cities and towns in China by using user search keyword data of shopping websites, and tries to predict it in time. It shows that there is a significant causal relationship between search volume and CPI, and based on this, makes a prediction analysis of CPI. Taobao trading platform also uses online trading data to construct price indices, providing two different price indices. Based on the big data of Alibaba online shopping transactions, it is also convenient to calculate the detailed price indices of different categories of food, tobacco and alcohol, office supplies and services.

4. Application Suggestions of Short-term Statistical Forecasting of Macroeconomic Data

4.1 Establish Index System.

When freshmen enter the university, librarians should not only explain the basic functions of libraries, but also carry out basic knowledge education of information accomplishment, so that students can have a preliminary understanding of information accomplishment ability. In the teaching of document retrieval, we teach students how to use Internet technology to search books or materials, and lay a foundation for student’s future study and research. In the special lecture, we should stress on the necessity of solving the information accomplishment ability and how to make use of the advantages of “internet +” to enhance the comprehensive ability of students and promote the all-round development of students. Change the original single paper media, so that readers can understand from multiple senses. The purpose of information accomplishment education is to cultivate the reader's academic information ability, that is to say, the ability to participate in personalized and professional academic activities and acquire new knowledge by using academic information. In the process of teaching, teachers need students to master a certain degree of relevant professional literature retrieval knowledge. According to the individual requirements of professional teachers, university libraries can incorporate the training of literature resources retrieval methods and skills for students into their curriculum, so that students can master the distribution, retrieval tools and retrieval skills of professional literature resources. Under the background of “internet +”, the media and communication modes of information accomplishment education are not single. For example, MOOC is a new carrier of information accomplishment education. It realizes the full participation of information accomplishment education curriculum. On the MOOC platform, it brings students a new experience of aggregation, efficiency and interaction, increases their interest in learning, and can read at anytime and anywhere on the mobile terminal. It is free from the constraints of time and space, and enjoys personalized services. There is also a professor who takes advantage of MOOC class to lead students to develop this course into online game software and embedded it in the platform to realize the combination of teaching and pleasure.

4.2 Enhance Elasticity Prediction.

In the traditional information accomplishment education of university students, the main purpose is to provide literature retrieval course, which aims to let university students know how to obtain valuable information by means of library resources and network resources. Under the background of “internet +”, the demand for students' ability training has been increasing. It is urgent to reform the information accomplishment education in university libraries. We should change the existing teaching contents, innovate educational forms, strengthen students' learning ability, and enhance their comprehensive quality. Universities should do a good job in basic education, so that students can grasp the key points of literature retrieval and make proper use of media knowledge. University

libraries should attach importance to information ethics education and guide students to use information strictly in accordance with relevant laws and regulations. It cannot be used at will, otherwise it needs to bear legal responsibility. University libraries should pay attention to the application of information technology, increase the application of information technology in the teaching process, let students learn to use information technology to query the information they want, and form a database, in order to better enhance information accomplishment. At present, most universities offer literature retrieval courses, some of which are optional courses and some of which are compulsory courses. Document retrieval course should adopt the teaching method of combining theory teaching with on-line practice. Library teachers should keep track of the changes of various literature resources at any time, adjust the teaching content in time according to student's needs, and improve students' practical ability of literature retrieval through classroom explanation, proposing homework topics, letting students practice on-line and answering questions on-site. Some libraries have also developed online classes to publish courseware and homework exercises on the Internet, which makes it easier for students to use the Internet to learn literature retrieval skills, and the learning effect is very remarkable.

4.3 Make Full Use of Big Data.

Macroeconomic forecasting and analysis based on large data will show significant advantages. In addition, some scholars point out that macroeconomic forecasting analysis based on big data will also derive its unique advantages of relatively low cost and high granularity. Because the large network data are automatically recorded when events or transactions occur, it does not need human investigation and collection, and can be extracted and sorted out by technical methods, which can greatly reduce the cost of data acquisition. At the same time, in order to reduce costs, the traditional data collection process will try to collect overall data, rather than detailed data collection. In the era of big data on the internet, there is little difference between collecting general data and collecting a certain kind of data separately. It can provide more detailed and meaningful data information without significantly increasing the cost. Gross domestic product (GDP) is the core index to measure the overall macroeconomic situation of a country or region. The judgment of its long-term and short-term trend and inflection point of growth is usually the focus of macroeconomic forecast. At present, the research of using big data to predict GDP trend is mainly based on the comprehensive use of large data such as network search data, network crawler data and traditional government statistics, combined with classical time series model, econometric model, new high-dimensional data model, machine learning and other methods to predict.

5. Conclusion

With the rapid development of statistics and big data, international academia and macroeconomic policy makers have realized the revolutionary impact of data on short-term macroeconomic analysis, and have gradually tried to integrate this concept, method, technology and macroeconomic analysis. This paper makes a preliminary discussion on the application of short-term statistical prediction of macroeconomic data, hoping to provide useful reference for future government and academic research.

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