

On the true face of the economic statistics

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Abstract

In 2012, China National Ministry of Education issued a new undergraduate course catalog, economic statistics to be classified as a second level discipline of applied economics. However, what specific content should be included in the second level discipline has become a very important issue. What should be taught to students or how can they adapt to the needs of the social market aroused a wide attention. For this case, the National Ministry of Education has given a clearly provision for economic statistics' core courses, but whether these main courses can reflect the actual needs and characteristics of economic statistics or not still needs some considerations and discussions.

This article started from the angle of the studies on China and the U.S. Journals concerning economic statistics. Using text mining by R, a recent mainstream statistical analysis software, a comparative analysis on the contents of economic statistics is conducted for recent decades. We created word cloud about the contents of core statistical journals by R which can help us visually examine the course of economic statistics discipline development for the comparative study. Besides, we drew a conclusion that there were significant differences between China and America's economic statistics, the main difference is the United States pay more attention to the exploration of new methods and be able to adapt to market demand, the development of China's economic statistics are still more traditional, it need a better understanding of the multi-disciplinary knowledge of education, especially interdisciplinary and cross-disciplinary learning, such as Bayesian and dynamics, though these are not belongs to the category of the economy, but it is in the use of statistical methods to solve economic problems which have plays increasingly prominent role. Another is that the curriculum of China's economic statistics are corrected for China's actual situation, a new training program pay more attention to students' practical ability and social practice, which has provided a guarantee for the healthy development of China's economic statistics. There are a lot of practical problems remain untouched or unsolved which need efforts of decades probably.

Key Words: economic statistics, text mining, word cloud, comparative analysis

Section I Introductions

After extensive research and found that, although many colleges and universities in China have set up a training plan for economic statistics class, in order to improve their overall quality and improve school quality requirements, professional training of the economic statistics also exist many problems. Then, compared by China and the U.S. undergraduate economic statistics courses, we analyze the features and rationality of the U.S. the undergraduate economic statistics courses, and found out the existing problems of China's economic statistics curriculum. As shown in the following table 1:

Table 1 Compare China and the U.S. economic statistics curriculum

The curriculum of America	The curriculum of China	
	Mathematical foundation courses	Statistics Foundation Course
Design of Experiments	Mathematical Modeling	National Accounts
Sampling Surveys	Linear Algebra	Regression Analysis
Quality control	Advanced Algebra	Stochastic Processes
Time Series Analysis	Mathematical Analysis	Non-parametric statistics
Nonparametric estimation	Theory of Functions of Complex Variables	Experimental Design
Regression	Optimization Methods	Statistical software(SPSS)
Statistics application software	Ordinary Differential Equations	Market research and analysis
Stochastic Processes	Artificial Intelligence	Sampling techniques
Data Analysis	Advanced Algebra and Analytic Geometry	Multivariate statistical analysis
Multivariate Analysis	Differential Topology	Econometrics
Bayesian Statistics	Function of real variable	Time Series Analysis
Decision Theory	Database tutorial	Financial Statistics Analysis
sequential analysis	Numerical Approximation	Insurance actuarial science
spatial statistics	Measure Theory	Data Mining
Statistical calculations	Dynamical Systems	Reliability Analysis
Parameter estimation and hypothesis testing	Non-life Insurance Mathematics	Statistical forecasting and decision-making
survival analysis	Set Theory and Graph Theory	Microeconomics and Macroeconomics
Econometrics	Finite Difference Method	Statistics Advisory
linear models	Functional Analysis	Statistical calculations

The analysis shows that in contrast to the heavy theory and light practice educational mode of China, the American University curriculum design is characterized by: (1) pay attention to the cultivation of students' statistical thinking, students learn mathematical and statistical foundation courses, such as: experimental design and data analysis. (2) focus on the improvement of the statistical capacity. American professors test the students achievement in the form of giving students alone or in small groups to complete a statistical analysis tasks instead of examination, and

finally to show the results by a report or a presentation. (3) focus on the application of statistical software. American universities focus on training the ability for students analysis their survey data as well as draw statistical model. Data processing mainly relies on statistical software, the American University commonly used statistical software: SPSS, SAS, Excel, S-Plus and R. SPSS, SAS and Excel domestic university teaching has been widely used, but the use of R language software is seldom. R is used for statistical analysis, drawing language and operating environment, which is a freedom, open source software. It is also an excellent tool for statistical calculations and statistical mapping. However, in the United States university, teachers valued the students' ability to solve problems including the use of statistical software, regardless of which method to use, if it can solve the problem to get the final conclusion, then it is a good way of feasible and desirable.

The main problems in China's economic statistics discipline training are:

(1) the school curriculum and local economic development do not match. The universities set up courses, not from the actual situation of the local economic development, but excessively emphasis on theoretical knowledge of specialty, Therefore, the students with low professionalism who is difficult to find suitable jobs. (2) Practicality of the knowledge of the students learned is not strong. The actual situation of China's economic statistics discipline now is: Teachers' teaching mode is old-fashioned and lags behind the current development of market, and the knowledge of students learned is narrow. As a result, China's college students not only lack of economic statistics theoretical, but lack of practical ability can not meet the needs of society for students of statistics.

Overall, compared to the domestic economic statistics teaching, the curriculum design of U.S. University economic statistics is more systematic and focus on students' abilities, make students have a real ability to use statistical methods to solve the economic problems.

Section II Text Mining Analysis

The following six pictures are a text analysis about the periodicals named “Journal of Business & Economic Statistics” from 1983-2012 of the United States and the economic statistics journals from the 1984-2013 of China.



1983-1992

1993-2002

2002-2013



1984-1993

1994-2003

2004-2013

First, let us observe the development of economic statistics in the United States from the following three angles.

1. Statistical model

In 1983-2002, it mainly using time-series data to create a model for regression analysis including model checking to predict the future development. As we all know, the time series data is bound to be influenced by cycle and seasonal factors, combining this case, there had been many seasonal adjustment model.

The 2003-2012 decade can clearly be found that the statistical model about the time series had turned into the model for the main use of panel data, such as additional quantile regression model, Bayesian multi-dimensional normal probability model, dynamic system model, more variable and the variable stochastic volatility factors processing.

2. Statistical analysis methods

From the previous three wordclouds on American Journal we know that the biggest change, in the nearly three decades, about selecting statistical methods is the use of Bayesian and dynamic systems theories. The 1983-1992 decade of these two methods articles rarely mentioned, but there is a lot of papers emerged in the next twenty years, especially in the last decade the Bayesian and dynamic systems theories have become the mainstream of the research methods.

3. Statistical indicators

The indicators system of U.S. economic statistics used in research which shift from the macroeconomic aspects in all aspects of the microeconomic. Indicators be used fully reflects the changes in the different periods of the United States and the international financial situation, the use of indicators to fully reflect the changes in the different periods of the United States and the international financial situation. Through market segmentation making statistical researches more practical significance.

Next let us focus on the development of economic statistics in China.

Obviously, the researches of Chinese economic statistics in 1984-1993 mainly focused on government statistics. It mainly works for government departments about statistics service, supervision and management. But the application of statistics on the economic aspects is scarcely. In 1994-2003, researches on economic statistics start to the development of statistical applications, it had gradually been used in the economic field and pay attention to the importance of the quality of data management and statistical information. In 2004-2013 researches on economic statistics has been

widely mentioned in the economic field, such as finance, agriculture, land, real estate, manufacturing. By using new statistical methods, such as dynamic systems, data mining, cointegration theory, establish many new statistical models like space model, time series model and the panel data model. Analysis on the overall development of China's economic statistics, analytical methods and modeling begins to substantially close to the direction of the United States, but there are still some lag.

From the overall analysis of the development of economic statistics, although there are still some lag, but has shown a trend that close to the United States.

Section III Conclusions

Finally, we drew a conclusion that there were significant differences between China and America's economic statistics, the main difference is the United States pay more attention to the exploration of new methods and be able to adapt to market demand, the development of China's economic statistics are still more traditional, it need a better understanding of the multi-disciplinary knowledge of education, especially interdisciplinary and cross-disciplinary learning, such as Bayesian and dynamics, though these are not belongs to the category of the economy, but it is in the use of statistical methods to solve economic which have plays increasingly prominent role. Another is that the curriculum of China's economic statistics has corrected for China's actual situation, a new training program pay more attention to students' practical ability and social practice, which has provided a guarantee for the healthy development of China's economic statistics. There are a lot of practical problems remain untouched or unsolved which need efforts of decades probably.

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