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The Comparative analysis of Economic Forecasting Model on China's Logistics Engineering Industry

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Abstract

As producer services, the world economic situation determines the performance of the global logistics industry, meanwhile logistics engineering has become a new impetus to economic development. Therefore, the analysis of economic forecasts, which is about total output value of China's logistics engineering, has some practical significance for some countries' logistics engineering research and financial budget. It is that five models are used to predict China's logistics total output value. The first is linear analysis based on China's GDP between 1978 and 2006. Next, four time-series models constructed using the same time range. Predictions of the logistics total output value from each of the 5 models are compared using actual data from years 2007-2009.The Holt-Winters non-seasonal model gives the least error between actual value and predicted values. Using this model, we predict the total logistics values for years 2010-2015. Finally, using a combination of the qualitative analyses, the Holt-Winters model is modified to be more accurate and more valuable in logistics engineering financial forecast.

Keywords: Regression analysis; Five models; Holt-Winters model; Qualitative analysis; Logistics engineering.

1. Introduction

As one of compound service industries, logistics is becoming a new driving force to economic development. At the International Symposium on Modern Logistics Development (jointly organized by the State Economic and Trade Commission and the World Bank) Wu Bangguo pointed out, "In the 21st century, the modern logistics industry will become an important industry in China's economic development and new economic growth point." Other economic experts expressed that the logistics industry is the "fire" or "accelerator" of modern urban economic development. Recently, economists have carried out predictions of the total output of logistics, so it obviously has a certain guiding significance.

Recently, some scholars have tried the time series modeling method to forecast China's logistics industry. Dong Yingying has predicted the logistics cost analysis using time series modeling methods 1. Yang Peihua has carried out time series forecasting of the logistics market capacity 2. Tian Genping and Zeng Yingkun have applied time series methods to the prediction of the logistic demand 3. Although there are some predictions of the logistics industry in the literature based on different time series models, it is difficult to find a comparison of results for different time series models. This paper consolidates previous research ideas and methods to do a comparative analysis of China's logistics total output value. After comparative analysis, it has drawn from the best solution, and it also has some significance for predicting the state of logistics engineering financial budget.

2. The Analysis of Methods for Predicting Total Output Value of China's Logistics Systems Engineering.

With increasing amounts of available GDP data, many scholars applied various time-series modeling methods to improve GDP forecasting. Therefore, the forecast of the GDP has been relatively perfected so we won't illustrate this more. The GDP and the China's Logistics total output value are connected so we first establish the correlation using linear regression analysis. The data is as follows: The Logistics total output value (Y) includes the transportation and storage industries, and postal service in tertiary industry. In this paper we are trying to predict the total output value of transportation and storage and postal service to reflect the total output value of the logistics industry.

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Table 1.GDP & Total Output Value of the Logistics Systems Engineering in China Since 1978 (in Billions of Yuan)

Year	Y*	GDP	Year	Y*	GDP
1978	182.0	3645.2	1994	2787.9	48197.9
1979	193.7	4062.6	1995	3244.3	60793.7
1980	213.4	4545.6	1996	3782.2	71176.6
1981	220.7	4891.6	1997	4148.6	78973
1982	246.9	5323.4	1998	4660.9	84402.3
1983	274.9	5962.7	1999	5175.2	89677.1
1984	338.5	7208.1	2000	6161.0	99214.6
1985	421.7	9016	2001	6870.3	109655.2
1986	498.8	10275.2	2002	7492.9	120332.7
1987	568.3	12058.6	2003	7913.2	135822.8
1988	685.7	15042.8	2004	9304.4	159878.3
1989	812.7	16992.3	2005	10666.2	184937.4
1990	1167.0	18667.8	2006	12183.0	216314.4
1991	1420.3	21781.5	2007	14601.0	265810.3
1992	1689.0	26923.5	2008	16362.5	314045.4
1993	2174.0	35333.9	2009	17057.7	340506.9

*Note: Y= output value of the logistics Source: China Statistical Yearbook-2010, National Bureau of Statistics of China, China Statistics Press ISBN 978-7-89468-150-8/F.350

3. Modeling and Analysis

3.1. Model One: Linear Regression

The plot about the output value of China's logistics (Y) and GDP is shown in Fig.1.below.

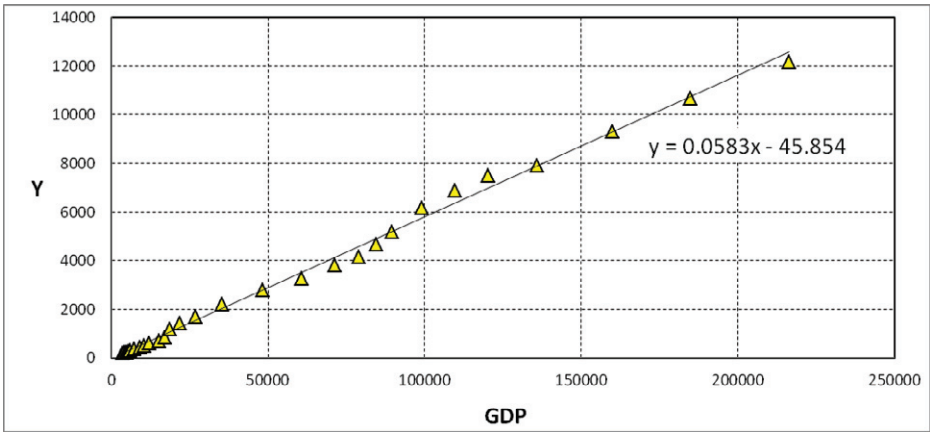

Fig.1 .China GDP vs. the Output Value of China's Logistics (Y)

The linear regression equation is: