Prediction Model of Dynamic Economic Growth Based on Cantonese-Kowloon-MAC Bay Area-A Case Study of Xiaolou Town Zengcheng

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Abstract—Under the guidance of China's regional coordinated development strategy, this paper puts forward a dynamic economic growth prediction model under the background of Cantonese-Kowloon-MAC Bay Area. The statistical analysis model of dynamic economic growth series data in Cantonese-Kowloon-MAC Bay Area under the background of Cantonese-Kowloon-MAC Bay Area is established, and the feature space structure of dynamic economic growth series is reorganized by combining fuzzy correlation analysis method, and the feature matching of dynamic economic growth series data is realized by combining big data fusion analysis method. The decentralized control model of dynamic economic growth series data is constructed by analyzing the warrants of time series detection of equity capital, and the fuzzy time series reconstruction is adopted by the methods of applicability analysis and model measurement analysis to realize the optimized construction of the prediction model of dynamic economic growth series data under the background of Cantonese-Kowloon-MAC Bay Area. Taking Xiaolou Town, Zengcheng as an example, the empirical analysis results show that this method has the better adaptability and higher prediction accuracy in forecasting the dynamic economic growth series data under the background of

Cantonese-Kowloon-MAC Bay Area, which improves the reliability of forecasting the dynamic economic growth under the background of Cantonese-Kowloon-MAC Bay Area.

1 INTRODUCTION

In 2019, the Guangdong Provincial Party Committee and the provincial government issued the Opinions on Constructing a New Regional Development Pattern of "One Core, One Belt, One District" to Promote the Coordinated Development of the whole province. Based on the development idea of "a game of chess in the whole province" and the differences in resource endowments among different regions, the Guangdong Provincial Party Committee and the provincial government promoted the differentiated development of regional characteristics according to local conditions, promoted the synergy of regional industries, and promoted the formation of a new economic development pattern of the whole province with reasonable layout, benign interaction, misplaced development and coordinated functions. Among them, the "one core"-the Pearl River Delta core area focuses on the development of advanced manufacturing industry, the "one area"-the coastal economic belt focuses on major industrial projects, and the "one area"-the northern ecological development area vigorously develops green economy. The new development pattern of "One Core, One Belt, One Area" promotes the coordinated development of Guangdong's industrial strategy, the continuous optimization and upgrading of manufacturing industry, and the coordinated integration of producer services and manufacturing industry, which promotes the extension of industrial chain to service industries with high added value and strong profitability. Under this background, the agglomeration and coordinated development of manufacturing industry and producer service industry in Guangdong Province is an important content of high-quality development of Guangdong's regional economy.

The new cycle of China's economic and social development is characterized by the "new normal", and it is actively building a new development pattern with the domestic big cycle as the main body and the domestic and international double cycles promoting each other, and further deepening the implementation of the regional coordinated development strategy nationwide[1]. Promoting the deepening and melting development of service industry and manufacturing industry and realizing "two-wheel drive" are the objective needs of adapting to the new normal, building a new development pattern and promoting regional coordinated development. Through theoretical mechanism analysis and empirical model, this paper studies the economic growth effect and intermediary role of technological innovation of the collaborative agglomeration of producer services and manufacturing industries in Guangdong Province, and provides scientific decision-making basis and policy suggestions for Guangdong Province to accelerate the realization of "two-wheel drive" of service industries and manufacturing industries, implement innovation-driven development strategy, and promote the coordinated development of regional economy and society in Guangdong Province[2]. On the basis of reading and sorting out a large number of related literatures, this paper aims to study

the economic growth effect of the collaborative agglomeration of producer services and manufacturing industries in Guangdong Province through mechanism analysis and constructing an empirical model with the intermediary effect of technological innovation, so as to clarify the relationship between the collaborative agglomeration of producer services and manufacturing industries, technological innovation and economic growth in the region. Based on the empirical research conclusion, combined with the actual development situation of Guangdong Province, it provides corresponding countermeasures and suggestions for Guangdong Province to carry out regional industrial division more scientifically, industrial structure adjustment and deepen innovation-driven development strategy to promote regional coordinated development.

Through forecasting and feature reorganization of economic sample information, combined with earnings analysis method, the analysis model of dynamic economic growth under the background of Cantonese-Kowloon-MAC Bay Area is constructed, and the dominant set analysis model of dynamic economic growth under the background of Cantonese-Kowloon-MAC Bay Area is constructed[3]. Through equity capital control method, the forecasting ability of dynamic economic growth under the background of Cantonese-Kowloon-MAC Bay Area is improved, and the research on the forecasting method of dynamic economic growth under the background of Cantonese-Kowloon-MAC Bay Area is of great significance in promoting balanced economic development.

2 STATISTICAL INFORMATION ANALYSIS AND FUSION PROCESSING OF DYNAMIC ECONOMIC GROWTH SERIES DATA IN CANTONESE-KOWLOON-MAC BAY AREA.

2.1 Statistical information analysis of dynamic economic growth series data in the context of Cantonese-Kowloon-MAC Bay Area.

In order to build a prediction model of dynamic economic growth series data in Cantonese-Kowloon-MAC Bay Area based on big data analysis, firstly, a statistical analysis model of dynamic economic growth series data in Cantonese-Kowloon-MAC Bay Area under the background of Cantonese-Kowloon-MAC Bay Area is built, and the characteristic series analysis of dynamic economic growth series in Cantonese-Kowloon-MAC Bay Area is realized by combining fuzzy correlation analysis method [4], and the constraint variable factors of dynamic economic growth series in Cantonese-Kowloon-MAC Bay Area are introduced. The fuzzy feature sampling information sample set of the feature point I of the dynamic economic growth sequence distribution in Cantonese-Kowloon-MAC Bay Area at time t is obtained by using the analysis methods of explanatory variables and statistical variables, which is expressed as, where the steady-state parameters of the dynamic economic growth sequence distribution in Cantonese-Kowloon-MAC Bay Area are expressed, and under the control of the stable growth trend mode, the statistical feature quantity of the fusion of the feature parameters of the dynamic economic growth sequence data in Cantonese-Kowloon-MAC Bay Area is obtained. Combining with the method of template feature matching, the weighting coefficient of economic dynamic growth forecast under the background of Cantonese-Kowloon-MAC Bay Area is obtained. According to the analysis of supplier concentration, the fuzzy similarity feature quantity of economic dynamic growth forecast under the background of Cantonese-

Kowloon-MAC Bay Area is established [5]. With reference to the differences in the selection of subjects, the standard quantitative distribution coefficient of economic dynamic growth under the background of Cantonese-Kowloon-MAC Bay Area is obtained as follows:

Wherein, $\max_l Freq_{i,j}$ is the fuzzy feature clustering function of the dynamic economic growth sequence under the background of Cantonese-Kowloon-MAC Bay Area, and d_j is the joint correlation distribution set of the dynamic economic growth distribution under the background of Cantonese-Kowloon-MAC Bay Area. Through semantic detection, the joint feature distribution value of the dynamic economic growth series under the background of Cantonese-Kowloon-MAC Bay Area is obtained as follows:

$$Idf_i = \log(\frac{N}{n_i}))$$ (1)

Wherein

$$w_{i,j} = tf_{i,j} \times Idf_i$$ (2)

Wherein, d_i and d_j are the correlation coefficients of the negative influence of concentration under the profit model of the blockchain economy. The fuzzy clustering method is used to predict the dynamic economic growth under the background of Cantonese-Kowloon-MAC Bay Area, and the spatial distribution function is as follows:

$$D(d_i, d_j) = \frac{d_i.d_j}{\|d_i\| \times \|d_j\|}$$ (3)

Based on the information asymmetry theory and earnings forecasting method, the statistical characteristics of joint detection of economic dynamic growth series under the background of Cantonese-Kowloon-MAC Bay Area are as follows:

$$
\begin{aligned}
z(t) &= s(t) + js(t) \otimes h(t) \\
&= s(t) + j \int_{-\infty}^{+\infty} \frac{s(u)}{t-u} du \\
&= s(t) + jH[s(t)]
\end{aligned}
$$ (4)

In the above formula, $a(t)$ is called the reliability feature distribution set of economic dynamic growth sequence under the background of Cantonese-Kowloon-MAC Bay Area, and f is called the difference function of time interval distribution. Based on the joint autocorrelation feature

analysis method, the average membership degree of each type of samples of economic dynamic growth sequence under the background of Cantonese-Kowloon-MAC Bay Area is obtained, which is the total number of samples sampled from the economic dynamic growth sequence under the background of Cantonese-Kowloon-MAC Bay Area. The joint feature distribution function of blockchain economic profit model is extracted, and the block function of statistical fusion center is obtained, and the joint statistical parameter distribution value of economic dynamic growth sequence under the background of Cantonese-Kowloon-MAC Bay Area is taken as the first cluster center. Therefore, the statistical information analysis of the dynamic economic growth series data under the background of Cantonese-Kowloon-MAC Bay Area is realized[6].

2.2 Data Fusion Analysis of Dynamic Economic Growth Series under the Background of Cantonese-Kowloon-MAC Bay Area.

Combining with the analysis method of feature detection of accumulated financial redundant resources, the equity capital feature matching of dynamic economic growth series data under the background of Cantonese-Kowloon-MAC Bay Area is realized, the separation degree of dynamic economic growth series data under the background of Cantonese-Kowloon-MAC Bay Area is expressed by $W\left(U;c,d\right)$, the fuzzy autocorrelation feature matching set of dynamic economic growth series under the background of Cantonese-Kowloon-MAC Bay Area is obtained, and the joint feature distribution set of dynamic economic growth series under the background of Cantonese-Kowloon-MAC Bay Area is established as follows:

$$P(K=T|R=1) = \frac{P(K=T)P(K=1|K=T)}{P(R=1)} \tag{5}$$

Wherein

$$P(K=T) = \frac{|C|}{|s|} \tag{6}$$

$$P(R=1|K=1) = \frac{NB}{|C|} \tag{7}$$

$$P(R=1) = \frac{NS}{|S|} \tag{8}$$

With the method of joint distributed detection, the characteristic variable of similarity of economic dynamic growth series under the background of Cantonese-Kowloon-MAC Bay Area at the i-th moment is obtained, and the correlation distribution type of the corresponding economic dynamic growth series under the background of Cantonese-Kowloon-MAC Bay Area is S, with a value of 1 or -1, in which 1 represents normal and -1 represents abnormal. The

mathematical model for forecasting and merging economic dynamic growth series under the background of Cantonese-Kowloon-MAC Bay Area is as follows:

$$y_i = f(x_1, x_2, \cdots, x_m) \tag{9}$$

According to the information fusion results, the big data distribution characteristics of the dynamic economic growth series in Cantonese-Kowloon-MAC Bay Area are extracted, and the prediction accuracy of the dynamic economic growth series in Cantonese-Kowloon-MAC Bay Area is improved[7].

3 PREDICTION AND OPTIMIZATION OF ECONOMIC DYNAMIC GROWTH SERIES DATA UNDER THE BACKGROUND OF CANTONESE-KOWLOON-MAC BAY AREA.

3.1 Feature extraction of dynamic economic growth series data under the background of Cantonese-Kowloon-MAC Bay Area.

Through the expected risk decision-making method, the financial redundancy and equity capital time series detection model of economic dynamic growth series data prediction under the background of Cantonese-Kowloon-MAC Bay Area is constructed. Based on the warrant analysis of equity capital time series detection, it is assumed that the initial frequency mean of the associated data in economic dynamic growth series under the background of Cantonese-Kowloon-MAC Bay Area under the background of Cantonese-Kowloon-MAC Bay Area is, the standard deviation is, the data training sample performs convergence control under the condition of adaptive optimization of the campaign, and performs abnormal state space update iteration according to the following formula:

$$\hat{\mu}_{k+1} = \hat{\alpha}\tilde{\mu} + (1-\hat{\alpha})\hat{\mu}_k \tag{10}$$

$$\hat{\sigma}_{k+1} = \hat{\beta}_k\tilde{\sigma} + (1-\hat{\beta}_k)\hat{\mu}_k \tag{11}$$

According to the optimal grouping detection results of the dynamic economic growth series in Cantonese-Kowloon-MAC Bay Area, the center point of the cluster is updated, and the correlation feature components of the associated data in the dynamic economic growth series in Cantonese-Kowloon-MAC Bay Area are obtained. Through mutual information parameter identification of the dynamic economic growth series in Cantonese-Kowloon-MAC Bay Area, the joint feature parameter distribution is obtained as follows:

$$\hat{\beta}_k = \hat{\beta} - \hat{\beta}(1-1/k)^q + n_i \tag{12}$$

Based on the above-mentioned processing, the information characteristic model of the dynamic economic growth sequence under the background of Cantonese-Kowloon-MAC Bay Area is constructed, and the joint probability density distribution of the dynamic economic growth sequence under the background of Cantonese-Kowloon-MAC Bay Area is obtained by combining quantitative regression analysis and subsection test method:

$$\varepsilon_t(i,j) = \frac{\alpha_t(i)a_{ij}b_j(o_{t+1})\beta_{t+1}(j)}{\sum\limits_{i=1}^{N}\sum\limits_{j=1}^{N}\alpha_t(i)a_{ij}b_j(o_{t+1})\beta_{t+1}(j)} \tag{13}$$

It can be seen from the above formula that the election algorithm is used to detect and fuse the features of the dynamic economic growth sequence in the context of Cantonese-Kowloon-MAC Bay Area[8].

3.2 Prediction of economic dynamic growth sequence under the background of Cantonese-Kowloon-MAC Bay Area.

The financial redundancy and equity capital time series detection model of economic dynamic growth series data prediction under the background of Cantonese-Kowloon-MAC Bay Area is constructed by the method of expected risk decision-making. Through the warrant analysis of equity capital time series detection and through joint parameter fusion, the joint distribution characteristic quantity of economic dynamic growth series under the background of Cantonese-Kowloon-MAC Bay Area is obtained. After joint autocorrelation characteristic analysis, $w_1(t)\cdots w_N(t)$ is obtained. It can be obtained that the Doppler parameter of economic dynamic growth series prediction under the background of Cantonese-Kowloon-MAC Bay Area is expressed as statistical time series and $\tilde{a}_1(t)\cdots\tilde{a}_N(t)$. By using the residual analysis method of regression model, the joint estimation of economic dynamic growth series under the background of Cantonese-Kowloon-MAC Bay Area can be made, and the maximum likelihood estimation value $\hat{s}_{0ML}$ and the natural distribution logarithm of economic dynamic growth series under the background of Cantonese-Kowloon-MAC Bay Area can be obtained as follows:

$$\begin{aligned} l_1(r) &= \int r(t)\sqrt{\hat{s}_{0ML}}f^*(\hat{s}_{0ML}(t-\hat{\tau}_{0ML}))dt \\ &= \max_{s,\tau}\left|\int r(t)\sqrt{s}f^*(s(t-\tau))dt\right| \\ &= \max_{a,b}\left|W_f r(a,b)\right| \underset{<}{\overset{H_1}{\underset{H_0}{\gtrless}}} \lambda_1 \end{aligned} \tag{14}$$

By the method of distributed estimation of autocorrelation features, the distribution coefficient of samples of dynamic economic growth series under the background of Cantonese-Kowloon-MAC Bay Area is obtained. Find the difference between the maximum membership degree and the maximum membership degree in each kind of dynamic economic growth series samples under the background of Cantonese-Kowloon-MAC Bay Area, reorganize the big data information according to the sales revenue data of the past five years, and obtain the detection statistical distribution value of economic time. By using the joint parameter analysis method, the output yield parameters of the dynamic economic growth series under the background of Cantonese-Kowloon-MAC Bay Area are as follows:

$$x_i^{'} = \frac{x_i - \overline{x}}{x_{std}}, i = 1, 2, \cdots n \tag{15}$$

In the formula, n represents the number of training samples of big data distribution of economic dynamic growth series under the background of Cantonese-Kowloon-MAC Bay Area, and represents the standard deviation of economic dynamic growth series distribution under the background of Cantonese-Kowloon-MAC Bay Area.

Through applicability analysis and model measurement analysis, combined with the comprehensive index measurement, the optimization construction of economic dynamic growth series data prediction model under the background of Cantonese-Kowloon-MAC Bay Area is realized.

4 EMPIRICAL ANALYSIS

In order to verify the application performance of this method in the prediction of economic dynamic growth series under the background of Cantonese-Kowloon-MAC Bay Area, taking Xiaolou Town, Zengcheng as an example, a data sample detection model for the prediction of economic dynamic growth series under the background of Cantonese-Kowloon-MAC Bay Area is built by using Matlab 7 and SPSS 17.0 statistical analysis software. The sample length of economic series data sampling is 1024, and the training set size of data samples is 214. The statistical distribution set is 120, and the autocorrelation distribution coefficient is 0.212. According to the above parameter settings, a descriptive statistical analysis model for forecasting the dynamic economic growth sequence in Cantonese-Kowloon-MAC Bay Area is constructed, as shown in Table 1.

TABLE 1. DESCRIPTIVE STATISTICAL ANALYSIS RESULTS OF ECONOMIC DYNAMIC GROWTH SERIES UNDER THE BACKGROUND OF CANTONESE-KOWLOON-MAC BAY AREA

Age	Economic input cost/million yuan	Rate of Return on Common Stockholders' Equity	Economic growth level
2007	0.712	0.063	0.583
2008	0.277	0.217	0.601

2009	0.156	0.297	0.512
2010	0.638	0.687	0.841
2011	0.685	0.630	0.245
2012	0.195	0.687	0.010
2013	0.663	0.409	0.404
2014	0.925	0.896	0.031
2015	0.878	0.379	0.391
2016	0.045	0.222	0.670
2017	0.604	0.905	0.366
2018	0.126	0.410	0.433
2019	0.186	0.839	0.354
2020	0.535	0.017	0.641
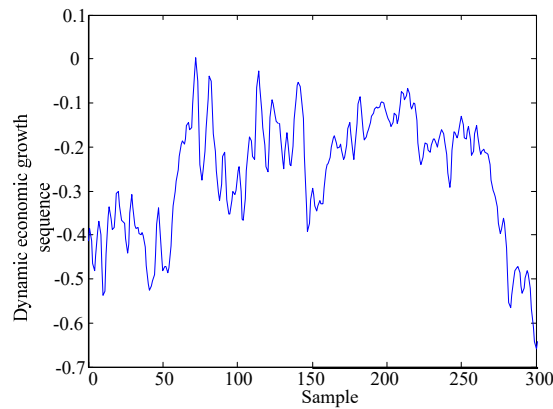
Figure 1. Input scatter diagram of data distribution of dynamic economic growth series under the background of Cantonese-Kowloon-MAC Bay Area.

According to the descriptive statistical analysis of the dynamic economic growth series in Cantonese-Kowloon-MAC Bay Area in Table 1, we forecast the dynamic economic growth series in Cantonese-Kowloon-MAC Bay Area, and get the input to scatter diagram of the dynamic economic growth series data distribution in Cantonese-Kowloon-MAC Bay Area as shown in Figure 1.

According to the distribution of economic input under the profit model of the blockchain economy, the dynamic economic growth sequence under the background of Cantonese-Kowloon-MAC Bay Area is predicted, and the predicted output curve of the dynamic economic growth sequence under the background of Cantonese-Kowloon-MAC Bay Area is shown in Figure 2.
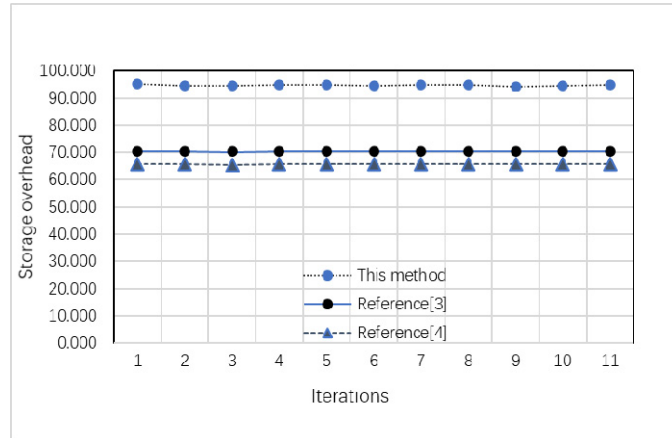
Figure 2. Prediction output curved surface of dynamic economic growth series in Cantonese-Kowloon-MAC Bay Area.

Analysis of Figure 3 shows that this method can effectively forecast the dynamic economic growth series in the context of Cantonese-Kowloon-MAC Bay Area, and test the accuracy of different methods in forecasting the dynamic economic growth series in the context of Cantonese-Kowloon-MAC Bay Area. The comparison results are shown in Figure 3. Analysis of Figure 3 shows that this method has higher accuracy in forecasting the dynamic economic growth series in the context of Cantonese-Kowloon-MAC Bay Area.
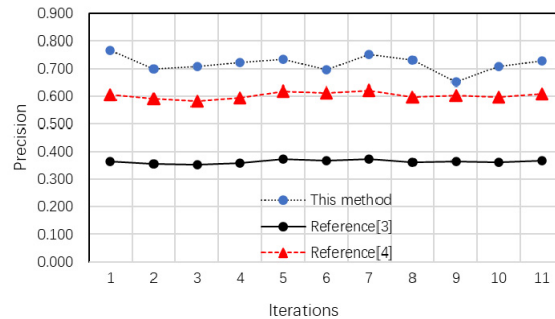

Figure 3. Accuracy comparison of economic dynamic growth series forecast under the background of Cantonese-Kowloon-MAC Bay Area.

5 CONCLUSIONS

The dominant set analysis model of economic dynamic growth forecast under the background of Cantonese-Kowloon-MAC Bay Area is constructed, and the forecasting ability of economic dynamic growth under the background of Cantonese-Kowloon-MAC Bay Area is improved by equity capital control method. This paper proposes a series data forecasting model of economic

dynamic growth under the background of Cantonese-Kowloon-MAC Bay Area based on big data analysis. Combined with fuzzy correlation analysis method, this paper analyzes the characteristic series of dynamic economic growth series under the background of Cantonese-Kowloon-MAC Bay Area, introduces the constraint variable factors of dynamic economic growth series under the background of Cantonese-Kowloon-MAC Bay Area, and adopts explanatory variable and statistical variable analysis method to obtain the joint characteristic distribution value of dynamic economic growth series under the background of Cantonese-Kowloon-MAC Bay Area. According to the information fusion results, the big data distribution characteristics of the dynamic economic growth series in Cantonese-Kowloon-MAC Bay Area are extracted, and the prediction accuracy of the dynamic economic growth series in Cantonese-Kowloon-MAC Bay Area is improved. The research shows that this method has higher precision and better performance in forecasting economic dynamic growth series under the background of Cantonese-Kowloon-MAC Bay Area. At the same time, the following conclusions are drawn: (1). The collaborative agglomeration of urban producer services and manufacturing industries in Guangdong Province has a positive role in promoting the level of regional technological innovation, and the level of informatization, government intervention and transportation infrastructure construction have a positive impact on the level of regional technological innovation. (2). The synergistic agglomeration of producer services and manufacturing industries in cities of Guangdong Province has a significant mediating effect on regional economic growth through technological innovation, that is, the effect of industrial synergistic agglomeration on economic growth is partly realized by promoting the level of technological innovation through industrial synergistic agglomeration, which in turn promotes economic growth.

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