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Forecast of Economic Growth by Time Series and Scenario Planning Method

—A Case Study of Shenzhen

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Abstract

"Time series analysis" is one of the main tools to predict the value of economic variable with the appropriate model to describe the time variation of historical data. "Scenario planning" is a kind of special research method which is used to analyze the macro environment of a subject. In the prediction of the growth trend of economic entities, the two methods can be used to a certain extent to avoid the prediction errors caused by environmental changes. The results showed that the economic growth of Shenzhen during "the 13th Five-Year Plan" would appear a slowing trend.

Keywords

13th Five-Year Plan, Trend Forecasting, Economic Growth, ARIMA Model, Scenario Planning Method

1. Introduction

Since Adam Smith, the economic growth has been a hot topic in economics circles, and an important constituent of main-stream economics. Kuznets, Nobel economics prize winner, measured economical growth with GDP growth rate and defined economic growth as an increase of GDP [1]. It is helpful to government's reasonable prediction of economic situation and establishing of economy development strategy that combining mathematics and computer technology to make scientific and precise qualitative and quantitative prediction result for trend of economic growth, thus it is of great practical meaning to use scientific and proven methods to predict GDP development trend of a certain economy in future [2]. Chinese economy is taking on "new normal" of steady increase, structural optimization and innovation driving, which means Shenzhen, a relatively developed domestic city, will break new ground. Then what status and trend have Shenzhen economic growth presented and what is the future trend on earth? It is a question of concern.

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For GDP prediction, the common ways are as follows: regression model [3], gray system model [4] [5], ANN predicted method [6] [7], Okun law method [8]-[10] and time series method, etc. For time series method, Zhao Ying used ARIMA model according to time data materials of actual GDP in China to make analysis and prediction over the national GDP growth pattern [11]. Macroscopic control group of economics institute in China Academy of Social Science used ARIMA model to predict the economic growth rate of China during the period of "12th five-year plan", and pointed out a growth trend of first rise then fall on the part of economic growth rate from 2010-2015 [12]. Chen Hongxia used wavelet multiresolution analysis—ARMA method to make predictive study over the economic growth rate of Shanxi in 2010-2015 with conclusion coincident with the status and trend of economic development in Shaanxi. For provincial economic growth [13], Qin Jingyun predicted GDP growth rate and per capita GDP of Guangxi from 2011 to 2030 based on national provincial panel data regression model to find that the GDP growth rate gone downward in Guangxi by around 2020, and entered differential period of economic growth path [14]. Liang Xin *et al.* used ARIMA (1, 2, 1) model to predict the GDP of Guangxi from 2008 to 2012 [15]. Similarly, prediction over economic growth in prefecture-level cities has also gained attention of some scholars. For example, Wang Yue used ARMA model periodic analysis and analysis on contribution rate of economic growth to predict actual GDP of Shanghai during the period of "12th five-year plan" through building statistical model and empirical analysis [16]. Yet the above research shows that most of them have following insufficiencies. Firstly, analysis on historical and actual basis of predicted object is absent, which, however, is all-important to economic prediction of mid- and long-term. Secondly, fluctuation of economy growth rate is the natural result when internal and external conditions of mid- and long-term economic growth change, which requires adequate attention by scientific and reasonable predictive study. But related analyses were rarely seen. The paper uses existing research technique for reference and to improve the method, takes Shenzhen as an example to analyze actuality foundation of economic growth, and subjects the Gross National Product of Shenzhen in 1978 to 2014 to modeling research, establishes autoregressive model of Shenzhen GDP, uses B-J (Box-Jenkins) method to identify the models and determine model's order, then fit, lastly introduces scenario analysis method to get mid and longer term quantitative measurement and qualitative analysis result for economy gross and growth rate in Shenzhen, so as to provide a scientific and reasonable reference for decision-making of "13th five-year planning" by related departments.

2. Prediction of Economic Growth

2.1. Selection of Prediction Model

After quick development in the past three decades, information of this rich growth journey must be included in GDP, Shenzhen economic gross statistical index, and certain periodicity and increase rule are exhibited. This rule will certainly be more obvious for the mid and long-term development potential of "13th five-year planning". Thus according to Shenzhen GDP data for time series analysis, we use data-driven modeling method to concentrate all the factors influencing GDP growth into increase history of GDP itself, so as to fit increase history and predict development and change of GDP during the "13th five-year planning". In the idea of data-driven modeling, all the factors influencing one variable are concentrated to this variable's historic records.

The changes of time series can be roughly divided into superposition or combination of trend change, periodic change, cyclical fluctuation as well as random fluctuation. As a common random time series model, ARIMA model was established by Box and Jenkins, called Box-Jenkins method or B-J method jointed [17]. ARIMA model has three basic types: AR: Auto-regressive model, MA: Moving Average model and ARIMA: Auto-regressive Integrated Moving Average model. The advantages of the method are it not only reflects the influence of systematic factors such as continual advancement of technology, and sustainable growth of work force, continual improvement of educational level, continual formation of capital, continual improvement of total factor productivity, but also includes many unobservable factors such as change of system, climate, ideal, etc. The paper adopts ARIMA model with form as follows.

Consider series y_t, if it can become stationary series after d times of differencing, *i.e.* $y_t \sim \mathrm{I}(d)$, then: $u_t = \Delta^d y_t = (1-B)^d y_t$, u_t is stationary series, *i.e.* $u_t \sim \mathrm{I}(0)$, then ARMA(p, q) model can be established.

$$u_t = c + \phi_1 u_{t-1} + \cdots + \phi_p u_{t-p} + \varepsilon_t + \theta_1 \varepsilon_{t-1} + \cdots + \theta_q \varepsilon_{t-q}$$

The ARMA (p, q) model after d order differencing is called ARIMA (p, d, q) model (Auto-regressive Integrated

Moving Average Model), in which p and q are order numbers of moving average, while ε_t is a white noise process.

2.2. Indices Selection

Local GDP is used to represent economic growth level of Shenzhen in this paper. Local GDP in Shenzhen is a monetary value index reflecting ultimate achievement of production activities of all resident units in the city in the whole year, able to deliver a comprehensive picture of total scale of economic activities in the whole society, and is an important comprehensive index to measure economic strength and evaluate economic situation in Shenzhen. For data of nominal GDP gross fails to eliminate effect of inflation, the paper takes the nominal data issued by Shenzhen Statistics Department and local GDP index number as reference to correct nominal GDP data series, and converts it to actual GDP series calculated by the price in 1979, and makes analysis according to this data series.

The growth rate of local GDP in Shenzhen refers to annual increase rate of GDP, and should be calculated by using Shenzhen total GDP calculated in comparable prices. The computing formula of actual GDP growth rate is as follows:

$$\text{real GDP growth rate} = \frac{\text{current GDP} - \text{previous real GDP}}{\text{previous real GDP}} \times 100\%$$

2.3. Data Description, Stationary Processing and Test

We obtain total local GDP in Shenzhen from 1979 to 2014 from "Shenzhen statistical yearbook", and use time series y_t to express it. GDP growth trend diagram is made according to these data (**Figure 1**), which roughly shows long-term rise trend of y_t, instead of being steadily flat. The first order difference of the original GDP sequence is performed by using eviews6.0 software (**Figure 2**), which still roughly shows it is not steadily flat. After second order differencing, it is difficult to see whether the time series of the two order difference is stable (**Figure 3**), then we perform ADF unit root test on the series, and use model of inconstant term and trend term for testing, and determine lagging order number of model is 3 according to AIC rule. The test result is as shown in **Table 1** and **Table 2**. Statistics value of second order difference ADF is 1.638473, which is greater than the critical values in three different significance levels and means that second order difference series is non-stationary. Then we go on to third order differencing (**Table 2** and **Figure 4**). We find that ADF statistics is −3.748875, smaller than critical values in three different significance levels, then series after third order differencing is stationary. So we think difference order number d of ARIMA (p, d, q) model is equal to 3.

2.4. Model Identification and Parameter Estimation

Then we define lagging order number p and q, ARMA (p, q) model's order number can be judged using cutoff property of the model sample's autocorrelation function and sample's partial autocorrelation function. The

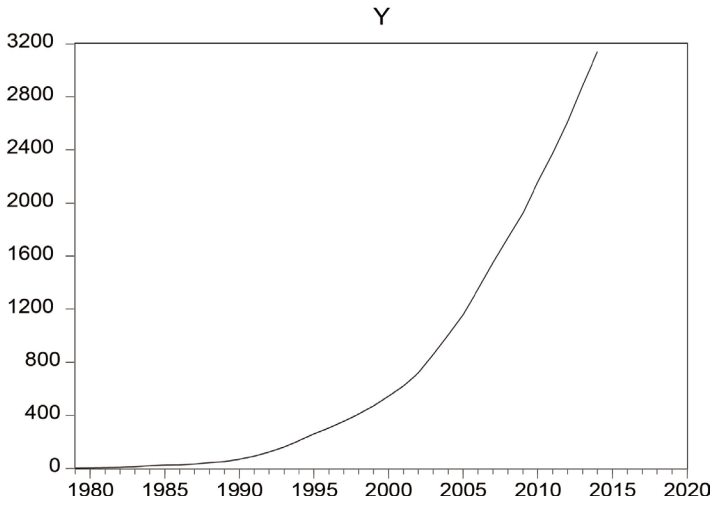

Figure 1. GDP broken line graph.

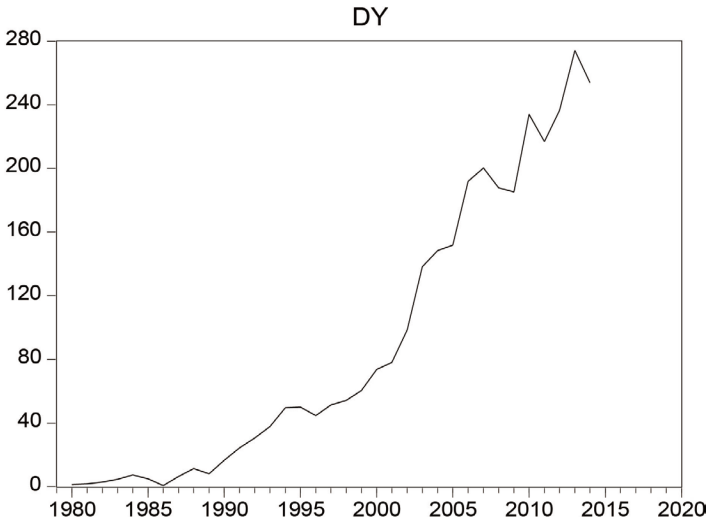

Figure 2. GDP first order difference broken line graph.

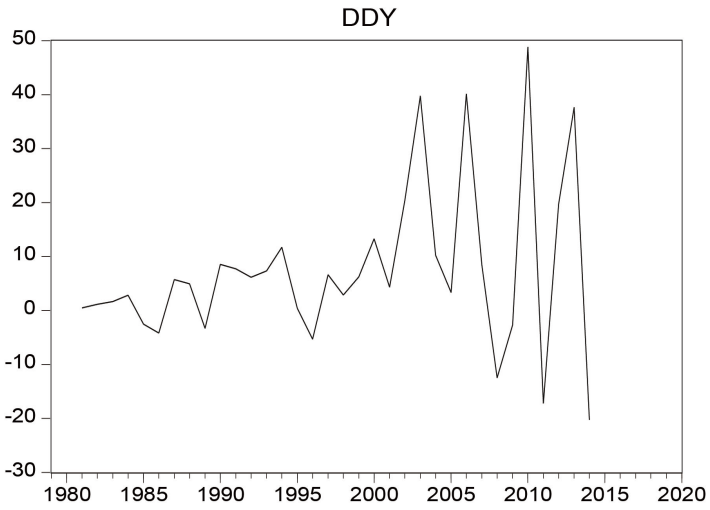

Figure 3. GDP second order difference broken line graph.

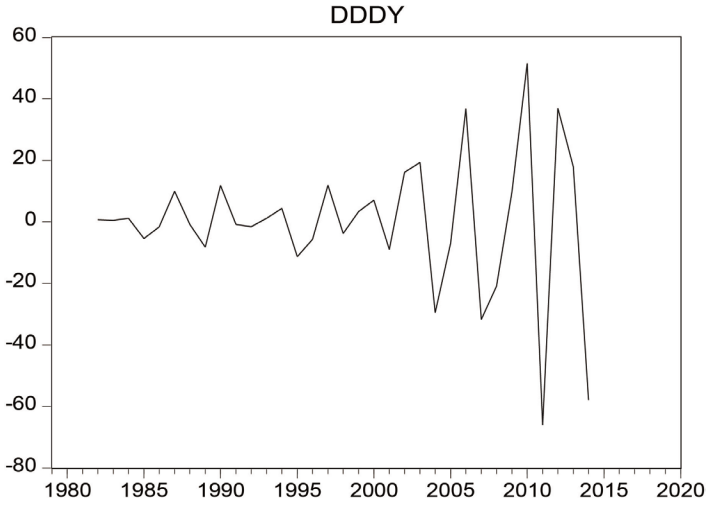

Figure 4. GDP third order difference broken line graph.

judgment rule is as follows: if partial correlation function of stationary time series is cutoff, while autocorrelation function is trailing, then this series is suitable for AR model; if the partial correlation function of stationary time series is trailing, while autocorrelation function is cutoff, then this series is suitable for MA model; if the partial correlation function and autocorrelation function of stationary time series are all trailing, then this series is suitable for ARMA model.

The results of autocorrelation function test to sequence $\Delta^3 y_t$, which can be seen in **Figure 5**, show that the autocorrelation coefficient (AC) and the partial autocorrelation coefficient (PAC) are not stable and respectively reduce from the eighth order and sixth order. So according to the Akaike info criterion and Schwarz criterion, the value of p and q are combined for 30 groups ARIMA (p, 3, q) [p = 2, 3, 4, 5, 6; q = 3, 4, 5, 6, 7, 8] model. By constantly adjusting the order, then residual autocorrelation tests of equation, tests of goodness of fit, we try to make the model fit the best. Ultimately we take the best p, q values were 5, 7, the following ideal ARIMA (5, 3, 7) model was get. The estimated results of the model by using eviews6.0 software are as follows:

$$\begin{aligned}\Delta^3 y_t &= 0.693012 + [AR(1) = 0.041558, AR(2) = 0.271372, AR(3) = 0.693298, AR(5)\\ &= -1.333350, \mathrm{MA}(1) = -1.759018, \mathrm{MA}(3) = 0.564195, \mathrm{MA}(4) = 0.752938, \mathrm{MA}(5)\\ &= 0.348454, \mathrm{MA}(6) = -1.595127, \mathrm{MA}(7) = 0.691729\end{aligned}$$

The output result of ARIMA (5, 3, 7) model (**Table 3**) shows that the model has high fit goodness, up to 0.90. All the parameters passed t test, p values are all lower than 0.05 (except AR (2)), and parameters are significantly different from 0. Meanwhile, the residual error series and $\Delta^3 y_t$ actual value and fitted value series are fitted (**Figure 6**). The figure shows that the change of model's fitted values and actual values has high consistency. The diagram of autocorrelation and partial autocorrelation about first 20 orders of residual error series ε_t is made, which shows the autocorrelation function and partial autocorrelation function all fall confidence interval, and residual error series should be the white noise process. This shows $\Delta^3 y_t$ fitted value is unbiased estimate of actual value. The model passes test and has good fitting effect.

Table 1. ADF test result of GDP second order difference.

ADF	Significant level	critical value
1.638473	1%	−2.664853
	5%	−1.955681
	10%	−1.608793

Table 2. ADF test result of GDP third order difference.

ADF	Significant level	critical value
−3.748875	1%	−2.664853
	5%	−1.955681
	10%	−1.608793

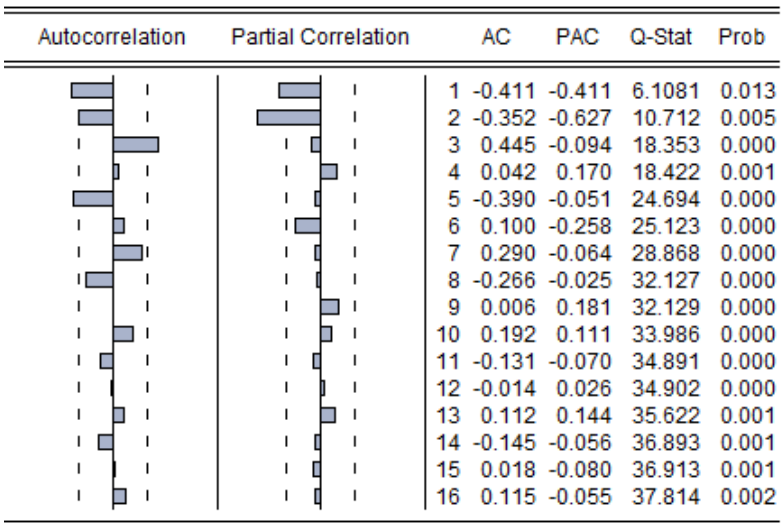

Figure 5. Autocorrelation function test result of series $\Delta^3 y_t$.

Table 3. Output result of ARIMA (5, 3, 7) model.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.693012	0.084694	8.182580	0.0000
AR(1)	0.041558	0.131407	0.316255	0.0057
AR(2)	0.271372	0.136115	1.993696	0.0625
AR(3)	0.693298	0.120527	5.752216	0.0000
AR(5)	−1.333350	0.204919	−6.506710	0.0000
MA(1)	−1.759018	0.074929	−23.47577	0.0000
MA(3)	0.564195	0.124849	4.519027	0.0003
MA(4)	0.752938	0.098721	7.626926	0.0000
MA(5)	0.348454	0.079011	4.410204	0.0004
MA(6)	−1.595127	0.197661	−8.069998	0.0000
MA(7)	0.691729	0.120259	5.752013	0.0000
R-squared	0.900758	Mean dependent var		−0.574836
Adjusted -squared	0.842381	S.D. dependent var		25.29851
S.E. of regression	10.04383	Akaike info criterion		7.738518
Sum squared resid	1714.936	Schwarz criterion		8.261884
Log likelihood	−97.33925	Hannan-Quinn criter.		7.898516
F-statistic	15.42989	Durbin-Watson stat		1.942597
Prob (F-statistic)	0.000001			

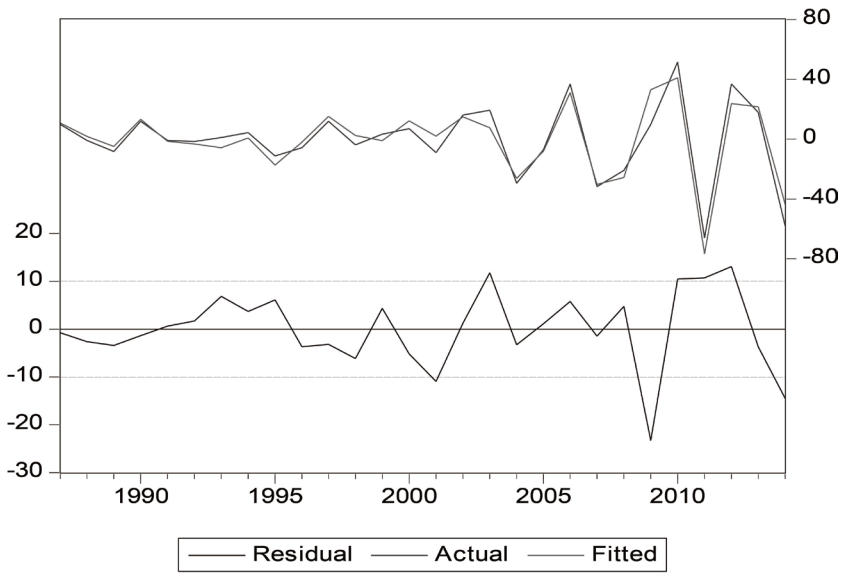

Figure 6. Series of actual values and fitted values of residual error series ε_t and $\Delta^3 y_t$.

2.5. Model Prediction

Based on the ARIMA model and the equation $\Delta^3 y_t = y_t - 2y_{t-1} + y_{t-2}$, the formula of y_t is:

$$y_t = 0.693012 + 2y_{t-1} - y_{t-2} + 0.041558 * \Delta^3 y_{t-1} + 0.271372 * \Delta^3 y_{t-2} + 0.693298 * \Delta^3 y_{t-3}$$
$$-1.333350 * \Delta^3 y_{t-5} + \varepsilon_t - 1.759018 * \varepsilon_{t-1} + 0.752938 * \varepsilon_{t-4}$$
$$+0.348454 * \varepsilon_{t-5} - 1.595127 * \varepsilon_{t-6} + 0.691729 * \varepsilon_{t-7}$$

Prediction over local total GDP of Shenzhen in 1987-2013 is made using ARIMA (5, 3, 7) model, and actual numerical values are used to calculate errors (**Table 4**). The data in **Table 4** show that the predicted values are much close to actual values, and average prediction errors are calculated as 1.5%, approximating to 2 percentage

points, which shows good fitting effect and higher prediction precision of the model. Thus this model can be used to predict the actual GDP of Shenzhen in "13th five-year planning" period (Table 5).

It is undeniable that any prediction of the future will have a certain error. To ensure the accuracy of the forecast as much as possible, the predicted results were limited in a certain range. According to the results and the mean prediction error from 1987 to 2014, this article takes the mean absolute error as 2% for convenient calculation, assume that the probability of the occurrence of a positive error or a native error is 1% and that the error increase 1% per year because of the dynamic prediction. The nominal GDP of Shenzhen will reach 3111 billion RMB in 2020 in the positive error and 2703.9 billion RMB in the native error. Therefore, in the benchmark scenario, the GDP of Shenzhen in 2020 should be in 2703.9 to 3111 billion RMB, with 2703.9 billion as the upper limit of the pessimistic scenario, and 3111 billion RMB as the lower limit of the optimistic scenario that year. Compared with that of the last five-year plan and the five-year plan before the last, the economic growth rate showed a falling tendency, with an average growth rate around 9.5% in the thirteenth five-year plan. And the average growth rate will be 9.5% in the thirteenth five-year plan in the positive error, 8.3% in the native error.

3. Scenario Analysis for Economic Growth

H. Kahn *et al.* borrowed the term of scenario in artistic creation and stage management to describe the "probable" development scenes of future. He believes that future is diversiform, and diversified potential results may be realized, and the ways are not same. Scenes are built by descriptions of paths to the possible future. From the perspective of Economics, Yue Zhen *et al.* (2006) thought that "scenario planning" is to conceive of possible future schemes through detailed and strict reasoning of future based on key hypotheses for major economic, in-

Table 4. Comparison of predicted values and actual values using ARIMA (5, 3, 7) models (unit: hundred million Yuan).

Year	actual values	Predicted value	Error rate	Year	actual values	Predicted value	Error rate
1987	31.59754	32.37	2.5%	2001	621.745	659.84	6.1%
1988	42.94045	46.54	8.4%	2002	720.149	761.13	5.7%
1989	50.97043	58.51	14.8%	2003	858.3161	879.29	2.4%
1990	67.53705	76.82	13.7%	2004	1006.734	1024.04	1.7%
1991	91.84889	100.21	9.1%	2005	1158.483	1165.73	0.6%
1992	122.3428	128.05	4.7%	2006	1350.387	1323.97	−2.0%
1993	160.1577	156.52	−2.3%	2007	1550.732	1513.94	−2.4%
1994	209.6906	197.60	−5.8%	2008	1738.601	1702.90	−2.1%
1995	259.6242	239.83	−7.6%	2009	1923.792	1895.16	−1.5%
1996	304.2476	285.93	−6.0%	2010	2157.829	2132.99	−1.2%
1997	355.5165	343.00	−3.5%	2011	2374.67	2371.38	−0.1%
1998	409.6683	410.13	0.1%	2012	2611.22	2603.62	−0.3%
1999	470.0571	476.05	1.3%	2013	2885.398	2891.08	0.2%
2000	543.7369	561.13	3.2%	2014	3139.31	3198.46	1.9%

Table 5. Actual GDP, nominal GDP and growth rate in Shenzhen (unit: hundred million Yuan).

Year	Real GDP	Nominal GDP	GDP growth rate (%)
2015	3480.86	17,773.65	8.8%
2016	3830.31	19,714.46	10.0%
2017	4223.85	21,913.91	10.3%
2018	4573.45	23,917.51	8.3%
2019	4981.03	26,257.40	8.9%
2020	5471.79	29,075.19	9.9%

dustrial or technical evolution. The basis point of "scenario planning" is that future is full of uncertainty, while its gist is to use diversified hypotheses to replace one hypothesis. Thus the predicted result will be multidimensional (**Figure 7**).

In an effort to comprehensively reflect GDP change in Shenzhen, the paper introduces scenario planning to analyze the macro environment of the development of Shenzhen economy, identify the major external and internal factors influencing its development, and make model analysis on the prospect of economic growth in Shenzhen during the "13th five year planning" period, and presents the results of economic growth in Shenzhen in reference growth scene, optimistic growth scene, pessimistic (risk) growth scene, as shown in **Figure 8**.

3.1. Rationale and Scene Setting

Based on combination of scene hypotheses about recent international, domestic and local economic development situation, we can identify several prediction schemes as shown in **Figure 8**. The best "optimistic" scene (quadrant I) is possible when optimistic changes occur concurrently in international, domestic and surrounding situations in Shenzhen; "mesoscopic scene"—"reference scene" (quadrant II) is possible when the international situation is pessimistic, while domestic or surrounding situation is optimistic; the worst "pessimistic" scene (quadrant III) is possible when the international situation is pessimistic, while domestic or surrounding situation is also pessimistic. "mesoscopic" scene—"reference" scene (quadrant IV) is possible when the international situation is optimistic, while domestic or surrounding situation is pessimistic. The specific scene design is as shown in **Table 6**.

3.2. Result Analysis

The results shown in **Table 5** indicate the possible economic development on condition that no significant changes happen in policies or external environment, namely, the effects of the economic fluctuation, the macroeconomic

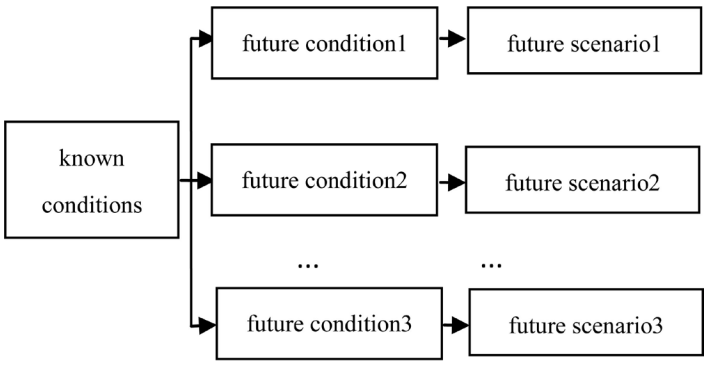

Figure 7. The basic framework of scenario planning.

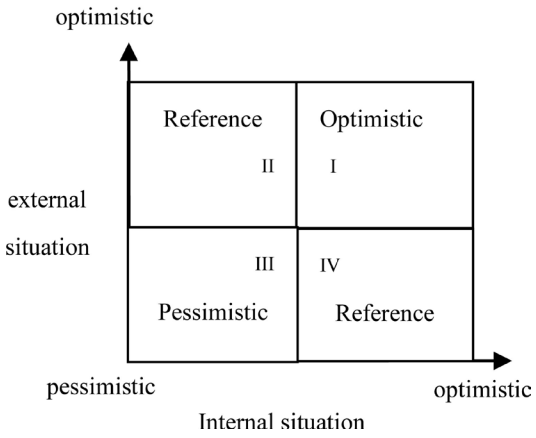

Figure 8. Scenario setting based on changes in the external environment.

policy changes or other special factors were not taken into consideration, and some main factors that influence the economic development of Shenzhen (such as the population and the labor force, natural resources, exports, technological progress, industrial structure, demand structure, total factor productivity and so on) change along the trend of the past in the analysis above. We use this as a benchmark of scenario analysis, providing comparable frame of reference to other situations. The predicted GDP for optimistic and pessimistic situations were calculated by increasing or decreasing the reference value by 2% respectively, and divided by the relevant implicit price deflator (**Table 7**). After error adjustment, the predicted GDP of Shenzhen from 2014 to 2020 in different situation was presented in **Table 8**.

Table 6. Scene hypotheses of future economic development situation in Shenzhen.

Scene hypotheses	Bad news/pessimistic	Good news/optimistic
International environment	Explosion of new-round global economy or financial crisis, slack international market demand, further enlarged debt crisis related to national sovereignty, tightened credit market, severe insufficient capital in cash, international economic stalemate sparked by new cold war and regional hot war, escaping of capital, especially foreign capital, disorder of international energy markets	Major innovation and breakthrough in human society, new-round of technological revolution, significant improvement of international trade environment, lowering of international tension, global economic resurgence, deepened globalization, loose monetary policy continued by related developed countries, still strong increase tendency of most of rising economies
Domestic and surrounding environment	Slow progress of structural transformation, slow technology innovation and efficiency improvement, further shortage of resources and deterioration of environment, domestic financial concussion sparked by local debt crisis, local undersupply aggravated by countercurrent flow of work force, climbing cost caused by price of resources such as manpower, aggravated insufficient domestic demand and over capacity	Quantum jump of reform and innovation, new demand and new market caused by technological revolution, increased domestic demand caused by urbanization-accelerated citizens' income and improvement of consumption level, increased export driven by foreign economic resurgence, significant improvement of interaction between regional economy integration and inter-area economic harmony, continuous economic prosperity in neighboring areas, including Hong Kong and Macau

Table 7. Predicted GDP value of Shenzhen in 2015-2020 (unit: hundred million Yuan).

Year	Pessimistic scene		Reference scene		Optimistic scene	
	Gross	Increase rate	Gross	Increase rate	Gross	Increase rate
2015	17,062.71	7.5%	17,773.65	9.7%	18,484.60	11.9%
2016	18,531.59	8.6%	19,714.46	10.9%	20,897.33	13.1%
2017	20,160.80	8.8%	21,913.91	11.2%	23,667.02	13.3%
2018	21,525.76	6.8%	23,917.51	9.1%	26,309.27	11.2%
2019	23,106.51	7.3%	26,257.40	9.8%	29,408.29	11.8%
2020	25,004.66	8.2%	29,075.19	10.7%	33,145.71	12.7%

Table 8. Predicted GDP value of Shenzhen in 2015-2020(error adjusted).

Year		Pessimistic scene	Reference scene	Optimistic scene
2015	Gross	16,728.42 ~ 17,418.18	17,418.18 ~ 18,129.13	18,129.13 ~ 18,861.54
	rate	6.4% ~ 8.6%	8.6% ~ 10.8%	10.8% ~ 13.0%
2016	Gross	17,992.86 ~ 19,123.03	19,123.03 ~ 20,305.90	20,305.90 ~ 21,542.52
	rate	7.6% ~ 9.8%	9.8% ~ 12.0%	12.0% ~ 14.2%
2017	Gross	19,388.03 ~ 21,037.36	21,037.36 ~ 22,790.47	22,790.47 ~ 24,650.17
	rate	7.8% ~ 10.0%	10.0% ~ 12.2%	12.2% ~ 14.4%
2018	Gross	20,506.28 ~ 22,721.64	22,721.64 ~ 25,113.39	25,113.39 ~ 27,687.51
	rate	5.8% ~ 8.0%	8.0% ~ 10.2%	10.2% ~ 12.3%
2019	Gross	21,808.98 ~ 24,681.96	24,681.96 ~ 27,832.85	27,832.85 ~ 31,272.99
	rate	6.4% ~ 8.6%	8.6% ~ 10.8%	10.8% ~ 12.9%
2020	Gross	23,386.83 ~ 27,039.92	27,039.92 ~ 31,110.45	31,110.45 ~ 35,618.35
	rate	7.2% ~ 9.6%	9.6% ~ 11.8%	11.8% ~ 13.9%

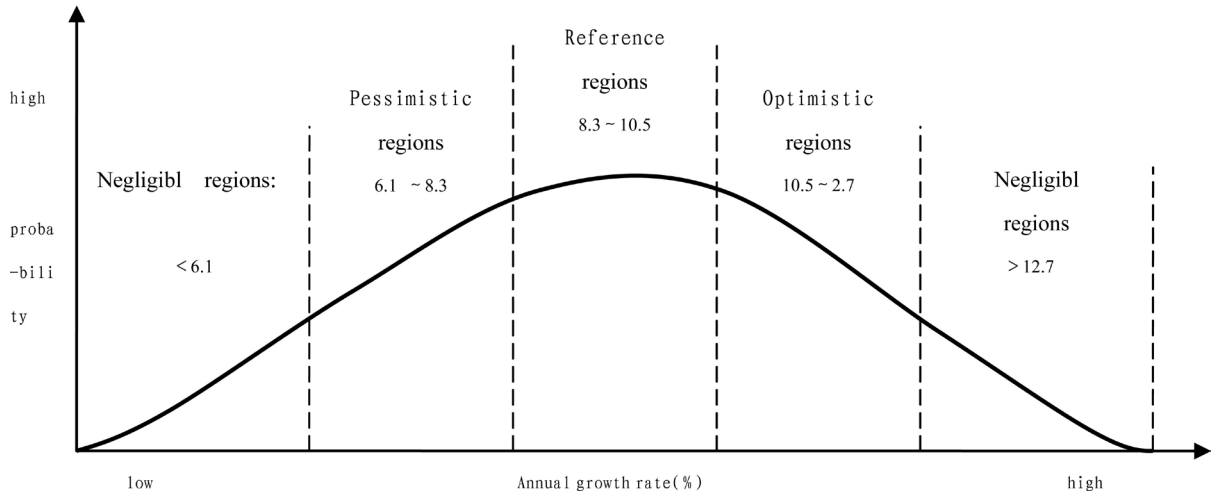

Figure 9. Scenarios and probabilities of annual growth rate of economic growth in 13th "five-year" plan.

3.3. Probability of Different Scenes

After combination of previous conclusion about status quo analysis, the probability of "mesoscopic" scene is the highest, so it is taken as "reference scene" (**Figure 9**). Against this background, in 2016-2020, average annual rate of GDP growth is 9.5%. After error adjustment, the economic growth rate in "reference scene" is between 8.3% - 10.5%. The probability of "optimistic" or "pessimistic" scenes is relatively lower, so they are taken as sub-reference scenes. In "optimistic/best" situation, in 2016-2020, the average annual rate of GDP growth is 11.5%. After error adjustment, the economic growth rate in "optimistic scene" is between 10.5% - 12.7%. In "pessimistic/risk" scene, in 2016-2020, average annual rate of GDP growth is 7.1%. After error adjustment, in "pessimistic scene", the economic growth rate is between 6.1% - 8.3%. Probability of other "extreme" scenes is extremely low, at two terminals of "pessimistic" scene and "optimistic" scene, and the economic growth rates are lower than 6.1% and higher than 12.7%, which is negligible.

4. Conclusion

The above analysis on Shenzhen GDP time series and established model shows that ARIMA model established by using B-J method has better predictive validity when modeling analysis is made for nonstationary time series. The ARIMA (3, 3, 5) model established in this paper better reflects law of economic development, and can be used for mid- and long-term predication over Shenzhen GDP. Besides, the introduction of scenario analysis method can give more scientificalness and accuracy to the prediction result and provide decision reference for Shenzhen to establish economic development objectives. The prediction result is as shown in **Table 8**. In summary, it is the precondition for scientific planning to make reasonable qualitative analysis and quantitative predication over future. Generally the prediction result of model coincides with the practical situation and trend of economic development in Shenzhen, and able to provide fundamental reference for dynamic target value of economic growth in "13th five-year planning" in Shenzhen. Main conclusions are as follows: in "mesoscopic/reference" scene, the average speed of growth of Shenzhen economy during the "13th five-year planning" is between 8.3% - 10.5%, and GDP can reach 2704.0 billion to 3111.0 billion Yuan by 2020, with trend of slowing increase rate; in "pessimistic/risk" scene, the average speed of growth of Shenzhen economy during the "13th five-year planning" is between 6.1% ~ 8.3%, and GDP can reach 2338.7 billion to 2704.0 billion Yuan by 2020, with trend of slowing increase rate. In "optimistic/best" scene, the average speed of growth of Shenzhen economy during the period of "13th five year planning" is between 10.5% ~ 12.7%, and GDP can reach 3111.0 ~ 3561.8 billion Yuan, with trend of slowing increase rate.

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