Research on the Influence of Regional Economic Development on Shenzhen’s Economic Vitality

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Abstract: We studied the population increment and enterprise increment under the policy of “building socialism with Chinese characteristics pilot demonstration zone” in Shenzhen and calculated the number of permanent residents and enterprises in Shenzhen in terms of short term (next year) and long term (next five to ten years). Combined with the new population and enterprises brought by the new economic policy and the model in question 1, the data of Shenzhen GDP in the short-term and long-term situations are calculated. So we concluded that the long-term impact on Shenzhen will be greater than the short-term impact in the future.

Keywords: Regional Economic; Development; Economic Vitality

1. Introduction

The economic vitality of a region is an important part of the regional comprehensive competitiveness, and the concept of “economic vitality” is composed of a variety of factors. What worth concerning is that the main representative factors are population and corporate vitality, and the function of analyzing the economic vitality of a region is to improve its regional competitiveness[1].

However, the huge differences in economic vitality between regions still exist due to their different policies, development capabilities and location conditions. Therefore, analyzing the reasonable factors that affect economic vitality and studying the important actions to improve economic vitality play an extremely important role in China’s future economic development[2].

2. Establishment and solution of model

We take Shenzhen as an example to analyze the economic vitality.

2.1 Shenzhen’s economic transition policy

2.1.1 A pioneering demonstration zone of socialism with Chinese characteristics in Shenzhen

On August 18, 2019, the Central Committee of the Communist Party of China and the State Council issued the opinions on supporting Shenzhen to build a pioneering demonstration zone with Chinese characteristics (hereinafter referred to the Opinions), and proposed that Shenzhen will become a modernized, international and innovative city by 2025; in 2035, it will become a model city for China to build a socialist modern power; by the middle of this century, it will become a global benchmark city with outstanding competitiveness, innovation and influence.
2.1.2 Changes brought by “Shenzhen’s construction of a pioneering demonstration zone with Chinese characteristics”

In the future, the planned area might approximately have 368,000 employed people and a residential population of 283,000. To attract high-end talents and enterprises, the planned area encourages the introduction of international public service functions, such as public art, professional medical services, professional education and training. Shenzhen encourages enterprises to invest in construction and operation and support social organizations to participate in the construction of urban public facilities, and it is also encouraged to build a rich and perfect urban public service system, including 28 kindergartens, 2 primary schools, 9 nine-year consistent schools, and 2 high schools.[3]

2.2 Impact of Shenzhen’s construction of a pioneering socialist demonstration area with Chinese characteristics on Shenzhen’s economic vitality

2.2.1 The forecast of Shenzhen’s short-term and long-term GDP by fitting historical data

The changes of Shenzhen GDP data over time:

| Years | Shenzhen GDP (100 million yuan) |
|-------|--------------------------------|
| 2011  | 11502.06                       |
| 2012  | 12950.08                       |
| 2013  | 14500.23                       |
| 2014  | 16001.98                       |
| 2015  | 17502.99                       |
| 2016  | 19492.60                       |
| 2017  | 22438.39                       |
| 2018  | 24221.98                       |

Table 1. Data on Shenzhen’s GDP

Use this data to plot the scatter diagram and trend curve of Shenzhen GDP over time, as shown in the figure.

Figure 1. Shenzhen GDP trend chart.
Through the linear fitting of excel, the linear function $GDP = 1820.9\ln + 9132.1$ with good fitting goodness is obtained, and the GDP values for the next year and the next five years are calculated, as shown in the table.

| Time | Shenzhen GDP value (100 million yuan) |
|------|--------------------------------------|
| 2019 | 20,520.2                             |
| 2020 | 27341.1                              |
| 2021 | 29162                                |
| 2022 | 30982.9                              |
| 2023 | 32803.8                              |

Table 2 GDP values for the next year and the next five years

Through the linear fitting of excel, the linear function $GDP = 1820.9\ln + 9132.1$ with good fitting goodness is obtained, so that the mean value of the predicted value of Shenzhen GDP in the next ten years is 33,714.25 billion yuan.

| Years | Forecast GDP (Unit: 100 million yuan) |
|-------|--------------------------------------|
| 2019  | 25520.2                              |
| 2020  | 27341.1                              |
| 2021  | 29162                                |
| 2022  | 30982.9                              |
| 2023  | 32803.8                              |
| 2024  | 34624.7                              |
| 2025  | 36445.6                              |
| 2026  | 38266.5                              |
| 2027  | 40087.4                              |
| 2028  | 41908.3                              |

Table 3. The long-term forecast of Shenzhen GDP (next ten years)

2.3 Interpretation of Shenzhen’s future economic policy and forecast of new GDP

2.3.1 Forecast of new GDP

Hypothetical variable

There is an assumption that the new GDP under Shenzhen’s policy of “building a socialist pilot demonstration zone with Chinese characteristics” is recorded as GDPSF.

Short-term forecast

According to 5.2.1, the forecast value of Shenzhen’s GDP in 2019 is 2.052 billion yuan, and the total number of Shenzhen residents in the appendix selected in 2019 is 11.0984 million.

According to the calculation formula of GDPSF, $GDPSF = 20,520.2 * 108 / 1190.84 * 104 * 28.3 * 104 = 487.66$.

Long-term forecast

(1) Forecast of Shenzhen GDP in the next ten years (2019-2028)

It can be known from 5.2.2 that the prediction results of Shenzhen GDP from 2019 to 2028 are as follows:
Table 4. Shenzhen GDP forecast results

According to the prediction results, the average value of Shenzhen’s GDP forecast for the ten years from 2019 to 2028 is 337.1425 billion yuan.

(2) The data of Shenzhen GDP forecast and historical values in the next ten years

From 2011 to 2018, Shenzhen’s GDP showed a rapid linear growth (from 1.2 trillion yuan in 2011 to 2.5 trillion yuan in 2018). So we predicted that in the next 10 years, Shenzhen GDP will eventually grow to about 4.300 billion yuan.

(3) Forecast of Shenzhen’s resident population in the next ten years (2019-2028)

This table is based on historical data of Shenzhen’s resident population

| Years | Shenzhen resident population (10,000 people) |
|-------|-------------------------------------------|
| 2015  | 1137.87                                   |
| 2016  | 1190.84                                   |
| 2017  | 1252.83                                   |
| 2018  | 1302.66                                   |

Table 5. Shenzhen permanent population

Polynomial prediction can be used to obtain the forecast value of the resident population from 2019 to 2028.

| Years | Permanent population (Unit: 10,000 people) |
|-------|-------------------------------------------|
| 2019  | 1190.84                                   |
| 2020  | 1272.35                                   |
| 2021  | 1304.84                                   |
| 2022  | 1337.33                                   |
| 2023  | 1369.82                                   |
| 2024  | 1402.32                                   |
| 2025  | 1434.81                                   |
| 2026  | 1467.30                                   |
| 2027  | 1499.79                                   |
| 2028  | 1532.28                                   |

Table 6. Shenzhen resident population forecast

According to the prediction results, the average value of the forecast value of Shenzhen’s resident population in the decade from 2019 to 2028 is 14,185.6 thousand.

Draw a scatter plot of the resident population forecast data and historical data based on the forecast data.

According to the calculation formula of GDPSF, GDPSF = 33714.25 * 108 /1418.56*104 * 28.3 * 104 = 672.59.
2.3.2 Explanation of calculation results

In the short-term, Shenzhen’s economic vitality under the policy of “building a socialist pilot demonstration zone with Chinese characteristics” can be expressed as an increase of 487.66; in the long run, Shenzhen’s economic vitality under the policy of “building a socialist pilot demonstration zone with Chinese characteristics” can be expressed as an increase of 672.59.

2.4 Impact analysis

We concluded that the economic transition policies will have a greater impact on the economic vitality of Shenzhen. In the future, the long-term impact on Shenzhen will be greater than the short-term impact. In addition, due to the process of urbanization and the development of modern industries during the economic transitions, the primary industry is in an uncertain position in the economic vitality of the Shenzhen area in the future, while the secondary and tertiary industries perform better in economic vitality with linear correlation.

References

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