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The Factors Affecting GDP Growth

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Abstract: This paper discusses the factors affecting GDP growth. By processing the data related to GDP, this paper uses AHP method, BP neural network, SVR method and economic policy correction model to quantitatively analyze the impact of different candidate countries on the U.S. economy and China's economy. Combined with political, economic, social, environmental and other factors, referring to the national policy, the index system is obtained. The judgment matrix is constructed by AHP, and the more important one is extracted as the main index. Then the evaluation is carried out by using neural network. Firstly, the index is combined with the existing GDP standard system, and then network training and simulation are carried out. After substituting the data, we get and analyze the interaction between the indicators of each factor, and determine the positive correlation and negative correlation between the factors in the schematic diagram. As for the influence of policy factors, GDP is indirectly affected through tangible influence.

Keywords: AHP; BP Neural Network; SVR; Economic Policy

1. Background

The US presidential election is held every four years. 2020 is the year of US president, with Republican candidate Donald Trump and Democratic counterpart Biden running for president. The candidates of both parties have different political stands and administrative programs in finance and trade, economic and financial governance, and some other different key development areas (such as COVID-19measures, infrastructure, taxation, environmental protection, medical employment, trade, immigration, education, etc.) The election of different will shape different strategic patterns of global economic and financial development, and have a greater impact on the U.S. economy and the global economy (including Chinas economy). How will different policies affect Americas economy and China, s economy? How should China respond? Your team is asked to collect the candidates policy propositions, policy guidelines and relevant data in different fields.

2. Data preprocessing

Although the US general election situation has brought certain fluctuations to the external situation of China economic operation, the result of the general election will not reverse the tone of the US policy toward China, which is based on competition. At present, China s economy is still in the process of recovery. Under the background of building a new development pattern dominated by a large domestic cycle, economic growth is more dependent on the smooth flow of domestic industrial chains, supply chains, and the domestic market. The influence of Chinas economy is relatively.

Now, through similar research, the first column of elements is determined, and the judgment matrix of target layer and criterion layer is obtained by the algorithm. The judgment matrix of five criteria layer and index layer is shown in Appendix. The maximum eigenvalue of a is as follows:

Table 1. Maximum eigenvalues of each judgment matrix

	1	2	3	4	5	6
Maximum	5	3.1237	4.2946	3.0875	4.0403	4.2027

When the judgment matrix A is completely consistent, it is impossible under normal circumstances. In order to test the consistency of the judgment matrix, we need to use the following formula to calculate its consistency index, and we also need to compare it with the average random consistency.

Table 2. Consistency ratio of each judgment matrix

	1	2	3	4	5	6
Maximum	0	0.061872	0.098213	0.043748	0.013421	0.067582

When C is less than 0.1, the judgment matrix is considered as the basic satisfactory consistency matrix; otherwise, the judgment matrix does not have the basic satisfactory consistency. It can be seen from the table that the judgment matrix is basically satisfactory and has passed the consistency test.

3. BP neural network

In order to realize the evaluation function of BP network, we first initialize it to make it closer to the main livable city index we choose. The number of main indexes is set as the number of nodes in the input layer of BP neural network, and the habitability is taken as the output of the model. As for the number of hidden layers and the number of neurons in each layer, we will debug the program determined in the test. By searching several best rankings, this paper finds the best ranking and score. In this paper, we select the top ten and search the data of the past six years, and select the data from the main indicators obtained in model 1. The function of artificial neural network is relatively simple by using the neural network toolbox provided by MATLAB. In the process of training, the number of hidden layer neurons in BP network can be determined adaptively. The following figure shows the training results:
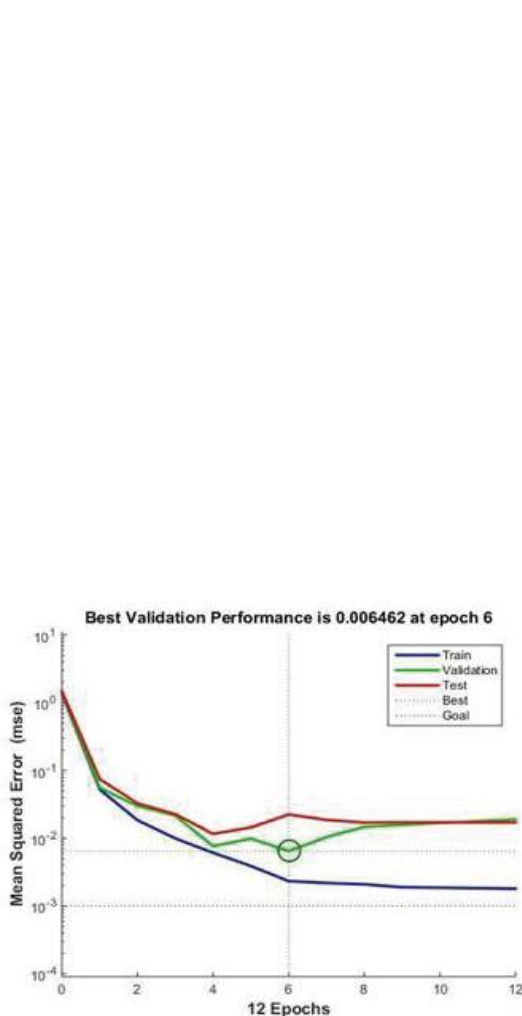

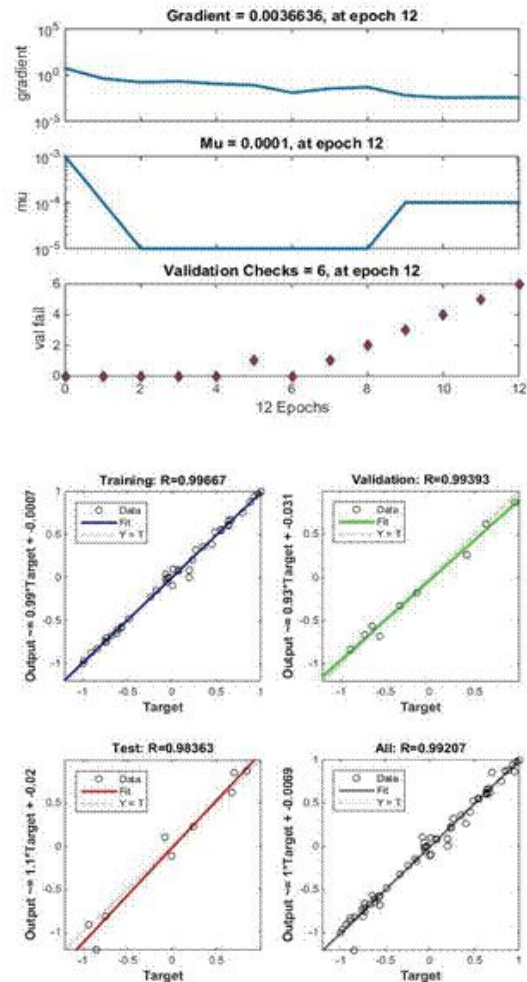**Figure 1.** Training results of neural network.   **Figure 2**

After continuous experiments, the number of the hidden layer is 7 and the number of neurons in the hidden layer is 50. It can be seen from Figure 1 and Figure 2 that when the training reaches the 12th stage, the minimum mean square error is the smallest. At this time, the accuracy is about 10-3, which meets the requirements. It can be considered that the training has been completed and the next simulation is in progress.

4. SVR Model

The main principle of support vector machine is similar to support vector machine, that is to find a regression plane, so that all the data in the training feature set are closest to the plane. The regression problem of support vector machine is reduced to a

nonlinear optimization problem: according to the dichotomy data of support vector machine, the data set is normalized and the distance of data regression plane is obtained. However, not all elements can be returned to the plane, and the distance between the data and the plane is very large. Therefore, a certain tolerance value can be set for the distance from each data to the plane to prevent over fitting. Manually set a parameter as an empirical parameter. If the distance between the data and the plane is less than, the cost is 0. In addition, the numerical optimization algorithm is used to solve the model parameters iteratively to determine the optimal regression surface of the regression data. Support vector machines (SVM) usually have good prediction results for various data forms. The optimal regression performance can be obtained by adjusting different kernel functions and parameters. However, support vector machine (SVM) regression has high requirements for parameter adjustment, so it is difficult to find the appropriate kernel function and corresponding parameters to achieve the optimal regression effect. Using MATLAB software to calculate the correlation coefficient of each model, the GDP fitting formula of China and the United States is as follows:
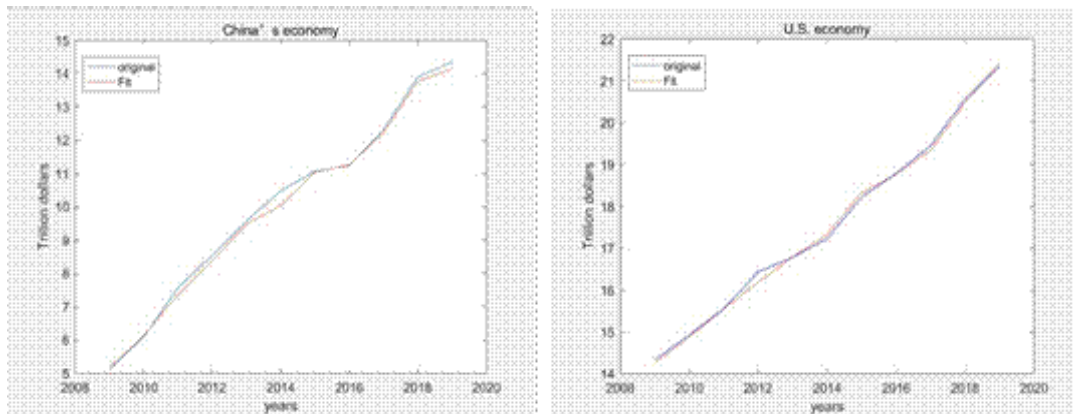

Figure 3. Fitting relationship test chart.

5. The impact of different candidate election on American economy

Biden and Trump have major differences on taxation, immigration, and climate change, and both will maintain the main tone of protectionism in trade policy. If Trump is re-elected, he will increase the protectionist policy towards China.
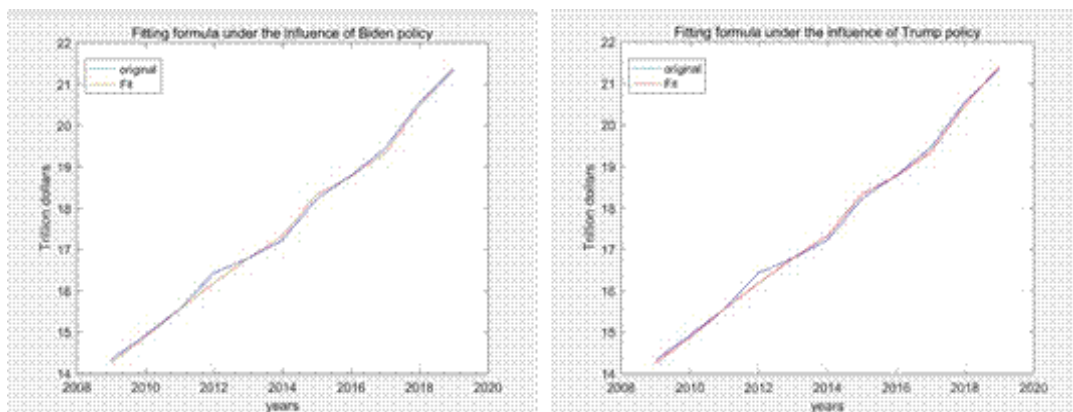

Figure 4. The impact of the election of different candidates on the U.S. economy.

The following table shows the GDP of 2020-2025.

Table 3. The impact of election on different candidates in the U.S. economy

Economic policy	2020	2021	2022	2023	2024	2025
Biden policy	21.1812	22.1134	22.5938	23.2534	23.8159	24.4926
Trump policy	21.1654	22.1765	22.5764	23.2543	23.8986	24.2437

Biden fiscal policy proposal will provide a booster for the US economic recovery Bidens USS4 trillion tax increase proposal and USS7 trillion spending plan are unlikely to be passed in the Senate, but the probability of passing the compromise plan is still relatively high. We predict that if Biden can push through most of the tax increase proposals and the $ 3 trillion spending plan, the US GDP growth rate in 2021 will increase by 1. 2 percentage points, and the GDP growth rate will reach 4.9%.

6. The impact of different candidate election on China economy

The situation of the US general election has brought certain fluctuations to the external situation of China economic operation, but the result of the general election will not reverse the tone of the US policy toward China, which focuses on competition. At present, economy is still in the process of recovery. Under the background of building a new development pattern dominated by a large domestic cycle, economic growth is more dependent on the smooth flow of domestic industrial chains, suppl chains, and the domestic market. The influence of Chinas economy is relatively.
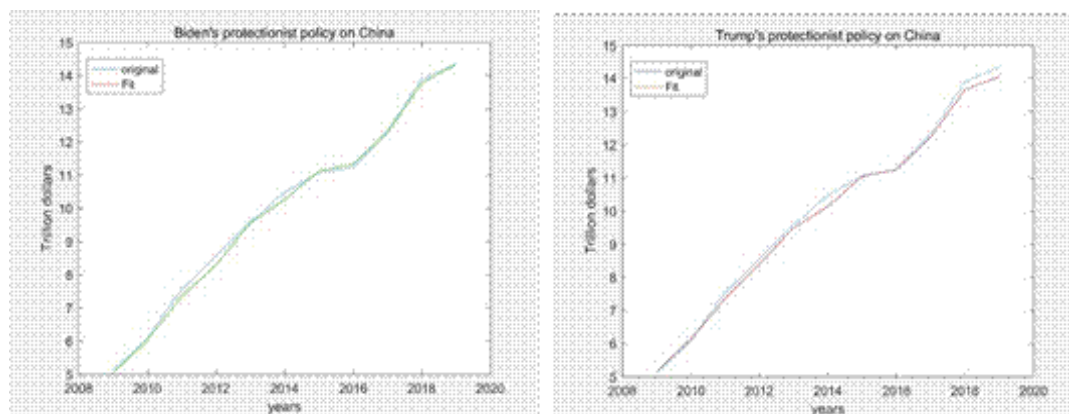
The following table shows the GDP of 2020-2025.

Figure 5. The impact of different candidates election on China economy.

Table 4. Impact of election on different candidates in China economy

Economic policy	2020	2021	2022	2023	2024	2025
Biden policy	15.21	15.77	17.36	18.16	18.97	19.55
Trump policy	15.11	15.88	16.63	18.09	18.82	19.22

The impact of the uncertainty in the US election on the Chinese economy is relatively controllable. Although the US general election situation has brought certain fluctuation the external situation of Chinas economic operation, it has a greater impact on some of China high-tech industries that are heavily influenced by the Sino-us game. However, since the financial crisis, Chinas economy has undergone tremendous structural changes, from external demand driven to domestic market driven, and the impact of changes in external demand on China economic operation is more controllable. Since the beginning of this year, in order to cope with changes in the external environment, China has further proposed to build a new development pattern in which the domestic large cycle is the main body and the domestic and international double cycles promote each other. In this context, China economic growth will rely more on expanding domestic demand, and the impact of external factors on Chinas.

7. Proposal

The situation of the US general election has brought certain fluctuations to the external situation of China s economic operation, but the result of the general election will not reverse the tone of the US policy toward China, which focuses on competition. At present, Chinas economy is still in the process of recovery. Under the background of building a new development pattern dominated by a large domestic cycle, economic growth is more dependent on the smooth flow of domestic industrial chains, suppl chains, and the domestic market. The influence of China economy is relatively.

The new crown epidemic is the biggest variable affecting Chinas economy this year From the perspective of Chinas economic operations in the first three quarters, China economy fell sharply in the first quarter under the impact of the epidemic, and negative growth for the first time since quarterly statistics. Since the second quarter, as the epidemic has been gradually brought under control and the production continues, industrial production, Infrastructure, real estate, Id state-owned investment, and other factors that are largely affected by policies bounded rapidly: in the third quarter , with the further manifestation of the effects of the stable growth policy and the further improvement of the confidence of enterprise sand residents , market factors also showed a significant improvement trend. The improved internal life can be strengthened. It is worth mentioning that, in the context of the global impact of the epidemic, Chinas exports have experienced staggered growth.

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