Analysis on the Time-domain Differences and Influencing Factors of China's Birth Rate

Si Lan

School of Economics, Jinan University, Guangzhou 510000, Guangdong, China.

Abstract

The number and quality of the population are related to the development of individuals and society. According to data from the National Bureau of Statistics, the birth rate dropped to 10.94‰, which is facing severe population problems. To this end, this paper uses the data of 31 provinces and cities in China to analyze the fluctuation and the nature of the birth population on a time series and geographical basis. From micro and macro perspective, a qualitative analysis is made on the factors affecting the birth rate and seven factors are determined for quantitative analysis. Through the stepwise regression to establish the model, the significant factors include per capita remuneration, juvenile dependency ratio and urbanization. Finally, suggestions are made to promote balanced population growth and achieve coordinated social and economic development.

Keywords

Birth rate, time domain difference, cluster analysis, stepwise regression.

1. INTRODUCTION

As the most populous developing country, China's population problem has always been an important issue related to social progress and development. Since the reform and opening up, China has made tremendous development achievements and this rapid development undoubtedly has a huge relationship with its "demographic dividend." The control of population is largely affected by changes in population policies[1].

In recent years, although China's total population has shown a slow growth trend, the birth rate has undergone tremendous changes from a high birth rate to a low birth rate. This change has led to a decline in the total fertility rate of the Chinese population, especially the total birth rate. The rate has been lower than the world's recognized population replacement level, which will undoubtedly have a huge impact on China's development. According to data from the National Bureau of Statistics, China's annual birth population was 14.65 million in 2018 and the birth rate was 10.94‰. The birth population has declined for two consecutive years after the comprehensive two-child policy. It is expected that the downward trend will continue in the future and the population will face a crisis of negative growth. From a spatial point of view, both the imbalance in the population structure of various provinces, municipalities and autonomous regions and the regional economic differences will affect the national birth rate[2].

Controlling the population and improving the quality of the population is one of the key issues in China's implementation of sustainable development strategies. Since the control of the birth rate is the main measure to control population growth, the study of the birth rate is not only the theoretical basis for China's family planning work, but also an effective measure to achieve rapid economic growth. The research on the factors affecting the birth rate can save the government's manpower and material resources in the implementation of family planning work, optimize population control measures and evaluate the degree of awareness of the significance of

population growth in a country or region, so as to provide constructive suggestions on population development.

2. METHODOLOGY

2.1. Hierarchical Clustering

Hierarchical clustering is a method of dividing each sample into several classes. The basic idea is: first treat each sample as one class, specify the distance between classes and select the pair with the smallest distance to merge into a new class. Calculate the distance between the new class and other classes, then merge the two classes with the closest distance, so that each class is reduced by one class until all the samples are combined into one class[3]. Proceed as follows:

(1) Calculate the distance $\{d_{ij}\}$ between n sample and record it as D;

(2) Construct n class, each class contains only one sample;

(3) Combine the two closest categories into a new category;

(4) Calculate the distance between the new class and the current class. If the number of classes is 1, go to (5), otherwise return to (3);

(5) Draw a cluster diagram;

(6) Determine the number and type of classes.

2.2. Stepwise Regression

The research on the influencing factors of population birth rate belongs to multiple linear regression problems. According to the theory of multiple statistical analysis, different analysis methods can be adopted, such as stepwise regression analysis, principal component analysis, factor analysis and other methods for research. In this paper, the existing data adopts the stepwise regression analysis method in the multiple linear regression model[4]. Under the premise of satisfying the assumptions of the classic linear regression model, that is, zero mean, same variance, no autocorrelation and normal assumptions, multiple regression is performed to study and explain the influence of the variable on the explained variable.

For multiple linear regression models $Y = \beta + \alpha X$, the least squares can be used to estimate the estimated parameters under the classical assumptions of the model and the parameter estimator $\beta = \dfrac{X'X}{X'Y}$. In the analysis of real economic problems, it is impossible for the explanatory variables to be completely linearly independent. If there is a linear correlation between the explanatory variables, there must be $|X'X| = 0$ and thus does not exist. The generalized square method is needed to solve the problem and the estimator is not unique. Stepwise regression analysis can not only test multicollinearity, but also an effective method to deal with multicollinearity problems.

The idea of stepwise regression is to filter and eliminate variables that cause multicollinearity through stepwise regression. Specific steps are as follows:

(1) According to economic principles and empirical judgments, select all possible explanatory variables $X_1, X_2, \cdots, X_n$, and perform multiple regression on n explanatory variable $Y = \alpha_0 + \sum_{i=1}^{n} \alpha_i X_i + \varepsilon$;

(2) Eliminate one variable one by one, do multiple regression on the remaining $n-1$ explanatory variables $Y = \alpha_0 + \sum_{i=1}^{s} \alpha_i X_i + \sum_{j=s+2}^{n} \alpha_j X_j + \varepsilon$, estimate and test the parameters, select the model with the smallest AIC according to the variable selection rule. Then continue to eliminate

the variables for regression, until the AIC no longer decreases. At this time, the model is
$Y = \alpha_0 + \sum_{i=1} \alpha_i X_i + \varepsilon$;

(3) Add a variable one by one and re-regression, so that the newly added explanatory variable reduces AIC, and the other parameter statistics of the equation are still significant, then this explanatory variable is retained; if the newly added explanatory variable does not reduce the model AIC, The explanatory variable is not retained; if the new variable reduces the AIC but also affects the significance of other variables, it indicates that the problem of multiple collinearity has occurred in the model. After comparing the explanatory variable with other explanatory variables, keep the more effective explanatory variable. After repeating the process, the model finally becomes $Y = \alpha_0 + \sum_{j=1} \alpha_j X_j + \varepsilon$.

3. TIME DOMAIN DIFFERENCE IN POPULATION BIRTH RATE

3.1. Timing Analysis

From 1999 to 2019, including 31 provinces, autonomous regions, municipalities directly under the Central Government and active military personnel of the Chinese People's Liberation Army, the total population of Mainland China at the end of the year, excluding Hong Kong, Macau Special Administrative Region, Taiwan Province and the overseas Chinese, showed a trend of increasing year by year. By calculating the population growth rate, it is found that under the effect of family planning, the population growth rate decreased significantly from 1999 to 2006. During the ten years to 2015, it basically fluctuated within the range of 0.5%. In 2016, thanks to the "comprehensive two-child" policy, the total population was 138.271 million, reaching a high point, but the growth trend has slowed since then.

Graph the changes in the total population and growth rate of the country, as shown in Figure 1, where the bar graph represents the total population (unit: 10,000), and the broken line represents the change in population growth rate (unit: ‰).
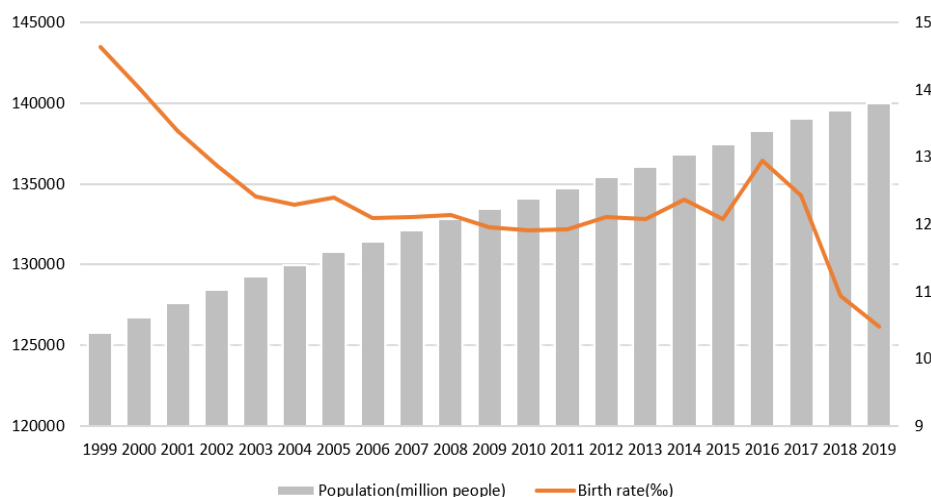

Figure 1. Graph of China's total population and growth rate change

From the line chart of population growth rate in Figure 1, it is found that the downward trend of growth rate may continue and the key to reversal depends on the change in the number of births. Based on the national birth population data since the founding of New China in 1949, a scatter plot was drawn and the trend was reflected by a broken line, as shown in Figure 2.

Figure 2. Trend change chart of China's birth population

According to the graph analysis, China has roughly experienced three waves of baby booms from 1962 to 1972, from 1982 to 1992 and from 2002 to 2012. The next two are basically caused by the first wave of babies to the marriage and childbirth period, which is the second wave of the first wave. Each stage typically shows a 10-year duration with a 10-year window period in between. In view of this impulsive change, China adopted the "two-child alone" and "two-child comprehensive" policies in 2013 and 2015 respectively, using the policy to release a wave of population and increase the number of births.

By the statistics from the Bureau of Statistics, in 2017, there were 17.23 million births in China, of which 42% were born with the first child, 51% with the second child and 7% with third child and above. The second child contributes more than half of the birth population, which is undoubtedly affected by the "comprehensive two-child" policy. However, this effective promotion of the birth population was short-term. After reaching a peak of 18.46 million in 2016, but in 2018, it dropped significantly by 2 million to 15.23 million. Historical data show that China's birth population, falling below 16 million six times since 2000, was between 15 million and 16 million. The number of births in 2018 hit the lowest level since 1961, which may indicate a population collapse slide.

Starting from the low value of the population born in 1999, make the curve trend of the birth rate in the past 20 years in Figure 3.
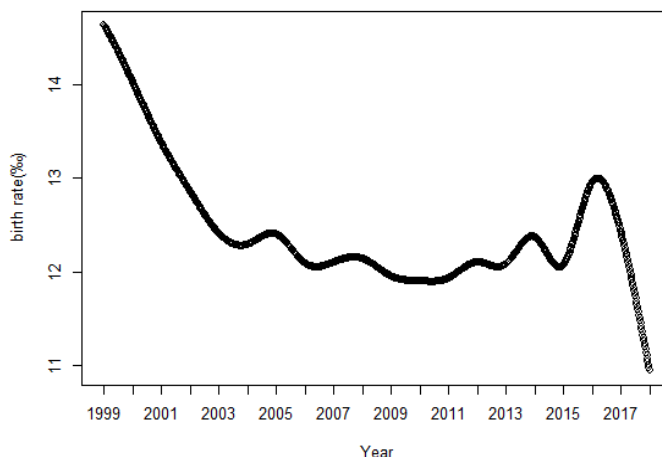

Figure 3. Trend change chart of China's birth rate

The "two ups and twos" of the birth rate happened during the period of the birth policy reform. Under the influence of family planning, China's birth rate has basically stabilized at around 12‰ from 2007 to 2013. After the "two children alone" policy was launched at the Third Plenary Session of the 18th Central Committee of the Communist Party of China in 2013, the birth rate in 2014 increased slightly and then quickly dropped. The second increase was the "comprehensive two-child" policy proposed at the Fifth Plenary Session of the 18th National Congress of the Communist Party of China in 2015. After it was formally implemented on January 1, 2016, the number of births in 2016 soared by 1.31 million. Meanwhile, the birth rate increased by about 0.9 thousand points than last year, reaching the historical peak of 12.95‰. However, the birth population in 2017 and 2018 did not meet the initial forecast and the birth rate fell again to 10.94‰, which indicated that after the implementation of the policy, the number of couples willing to give birth has been saturated.

3.2. Geographic Analysis

The birth rates of China's 31 provinces and municipalities from 2001 to 2017 in the 2002-2018 Statistical Yearbook released by the National Bureau of Statistics were clustered in the R Studio software. The cluster diagram is shown in Figure 4.
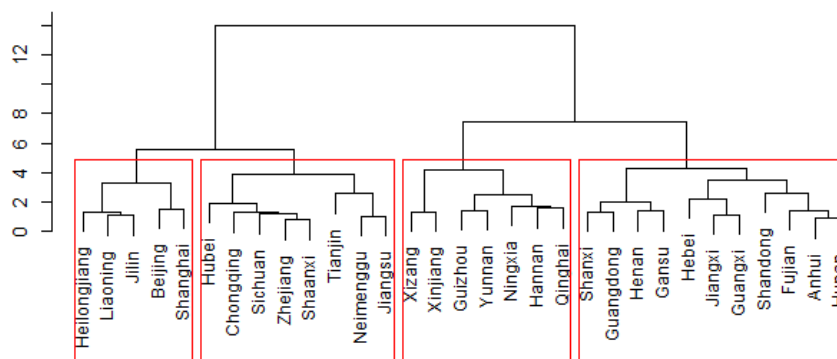

Figure 4. A cluster dendrogram of birth rates in 31 provinces and cities in China

The cluster classification situation is: Heilongjiang, Jilin, Liaoning, Beijing and Shanghai are the first category; Hubei, Shaanxi, Chongqing, Sichuan, Zhejiang, Jiangsu, Tianjin and Inner Mongolia are the second category; Xinjiang, Tibet, Yunnan, Guizhou, Qinghai, Ningxia and Hainan are the third category; Shanxi, Henan, Gansu, Hebei, Shandong, Anhui, Hunan, Guangdong and Fujian are the fourth category. The six provinces and cities of Beijing, Shanghai, Chongqing, Sichuan and Jiangsu are relatively developed. Heilongjiang, Liaoning, Jilin, Guangdong, Shandong, Fujian, Anhui and Hunan are the most populous provinces, while Henan, Gansu and Hebei have relatively low population densities. In addition, Yunnan, Ningxia, Hainan and Qinghai have relatively lagging economic development due to historical and regional factors. At the same time, it is also a gathering place for a few ethnic groups. Therefore, this classification can reflect the birth rate of various places.

According to the classification corresponding to the dendrogram, it can be found that from the spatial distribution, China's population birth rate has spatial differences and clusters in the spatial distribution. According to historical data, the provinces and cities with low birth rates are mainly Heilongjiang, Liaoning, Tianjin and coastal provinces in the east and northeast of Shanghai. The high birth rates in Tibet and Xinjiang have not changed much. Fujian, Guangxi and Shandong have policy responses more obviously.

4. QUALITATIVE ANALYSIS OF THE FACTORS AFFECTING THE BIRTH RATE

4.1. Micro Perspective

4.1.1 Family income

Western economist Becker believes that under a certain income level, the number of children in a family will depend on the cost of raising the children. On the one hand, when the family income level is in a period of growth, with the continuous improvement of living conditions and the basic guarantee of living can be solved, people are willing to spend more economic and spiritual costs to raise the next generation. On the other hand, when the family's income level reaches a certain level, the pursuit of quality of life will increase, so as the capital invested in children. Some families will make the best decision between the number and quality of children, hoping to improve the quality of children through fewer births. Therefore, the level of family income and the cost of raising children directly affect the increase or decrease of the birth rate to a certain extent.

4.1.2 Raising pressure

The cost of raising a child can be divided into two types: one is the direct cost, including all the expenses the family spends on the child, such as food and clothing, education, medical expenses, etc. from pregnancy to the birth of the child, and then to the stage of economic independence; The other is the indirect cost, which is the loss of various benefits that parents accept in the process of raising a child, such as reduced income and opportunities for promotion. The lower the fertility rate, the fewer the average number of children in the family, the higher the average cost of raising each child, so family will not choose to have more births, which in turn leads to a lower fertility rate.

4.1.3 Values

As a subjective manifestation of fertility behavior, personal fertility values have a guiding role in population fertility. There are old-style concepts such as "multiple children, more blessings" and "preferring sons over daughters" in traditional Chinese culture, which greatly influenced the birth choices of people from the 1950s to the 1970s. However, the current traditional concepts have gradually changed, giving birth to a child has become the mainstream choice and the importance of child education has increased because the importance of birth quality has significantly exceeded the number of children. Traditional values such as inheritance, raising children and guarding against the old tend to fade out and the utilitarian demand for childbearing is gradually weakening.

4.2. Macro Perspective

4.2.1 Economic Development

The current academic circles believe that there is a negative correlation between economic development and the birth rate in a certain development stage or within a certain income level. With the economic and social development, the production-oriented characteristic function of the traditional family has further degraded and disappeared. It has gradually yielded to the large-scale social production link. The problems of unemployment, poverty, hunger and disease have been solved. The marketization of family consumption structure has increased, lifestyles have changed and people's concept of childbirth has changed from more to fewer births and eugenics, which has leaded to the decline of the birth rate.

4.2.2 Consumption level

The level of social consumption has a direct impact on raising cost pressures. Due to various objective conditions and scarcity of resources in China, assuming other factors remain unchanged, the increase in consumption level means that the proportion of expenditures on

childbirth will increase. This causes the family to face huge reproductive behavior costs and bear greater economic pressure in general.

4.2.3 Social Security

For the relationship between the birth rate and social security, one view believes that the improvement of social security has an inhibitory effect on the birth rate, while the other believes that the increase in the level of social security has no negative impact on the birth rate. With the continuous improvement of China's endowment insurance level, people's concepts have gradually changed. They are no longer constrained by traditional thoughts such as "unfilial piety, no successor" and other traditional ideas. At the same time, less and less dependent on the next generation, which affects people's willingness to reproduce. In addition, the advancement of medicine and the development of maternal and child health care have increased the survival rate of young children, reduced child mortality and affected the birth rate.

4.2.4 Education level

With the improvement of per capita education level, on the one hand, the practice of social enterprises to increase output by increasing labor input has gradually been replaced by knowledge and scientific and technological innovation-intensive production methods, productivity has increased and the economy has developed rapidly. On the other hand, rapid economic development has stimulated people to invest more in education, technology and innovation, speeding up productivity growth and promoting economic development. The two promote each other and improve together.

At the individual level, through receiving education to form a new era of equality between men and women and independent, parents with higher education level expect more quality of their children than quantity. In addition, the improvement of education level will affect the age of marriage and childbirth to a certain extent, especially for women. Those who wish to get more educated, once invested in learning, will mostly consider marriage later and delays the time of first childbirth.

4.2.5 Urban Development

The process of urbanization can summarize the maturity of a city, including economy, technology and culture. In countries or regions with a high level of urbanization, the average education level is higher, the willingness to bear children is often lower and the childbearing age is larger. The more developed places are also in a leading position in terms of economy, technology, medical care and security, which will help increase the birth rate.

4.2.6 Population Policy

Population policy is a policy formulated by the government of a country or a region to intervene and regulate the process of population changes and population development or the principles proposed as the basis of measures. The government has two attitudes towards intervention and regulation of population development: one is open direct intervention, the regulation and intervention of population development are open, active and clear; the other is indirect intervention with a tendency, through social economic policies and social welfare policies implement interest induction to influence population changes, such as supporting the organization of family birth planning and raising taxes related to population [5].

5. QUANTITATIVE ANALYSIS OF INFLUENCING FACTORS OF POPULATION BIRTH RATE

5.1. Model Preparation

Based on the analysis of the factors affecting the birth rate from the macro and micro perspectives, the following seven indicators are selected to summarize the economic level, consumption level, education level, people's livelihood security and regional development[6].

The birth rate (BIR) refers to the ratio of the average number of people born per 1,000 people in a certain period (usually a year), and the unit is per thousand. The calculation formula is the annual number of births divided by the annual average number), where the annual number of births is the number of live births and the annual average number refers to the average number of people at the beginning and end of the year.

Gross domestic product (GDP) refers to the total value of all final products and services produced by a region in a certain period of time. It is a core indicator of national economic accounting and an important indicator of a country's overall economic status.

Resident consumption level (CON) is the result of a comprehensive summary calculation of the urban consumer price index and the rural consumer price index, reflecting the relative number of changes in the prices of consumer goods and service items purchased by urban and rural residents in a certain period of time, . It can be used to observe and analyze the impact of changes in retail prices of consumer goods and service prices on the actual living expenses of urban and rural residents.

Per capita remuneration (INC) refers to the average remuneration received by employees in a certain period of time per person, indicating the wage level of employees in a certain period.

The youth dependency ratio (YOU) is calculated by dividing the total population between 0 and 14 years old by the total population between 15 and 64 years old.

The old-age dependency ratio (OLD) is calculated by dividing the total population over 65 by the total population between 15 and 64 years old.

Educational Level (EDU) refers to the proportion of the population with an education level above technical secondary school in the region.

Urbanization (URB) refers to the process of urbanization in a region, which expressed as the percentage of the urban population of the region divided by the total population. The unit is a percentage.

In order to better reflect the relationship between the birth rate of the population and various influencing factors, do logarithmic process on the selected large-scale data including gross national product (GDP), household consumption level (CON) and per capita remuneration (INC), after which lnGDP, lnCON and lnINC were obtained. Here, the logarithmic processing will not change the nature of the data, but it can compress the scale of variables, reduce some unstable data sets and weaken heteroscedasticity and collinearity.

5.2. Data Description

Perform descriptive statistical analysis on the seven variables after preprocessing, including minimum, maximum, quarter quantile, median, third quarter quantile and mean, then summarize in Table 1 below.

Table 1. Variable descriptive statistics

	Min	1st Qu	Median	Mean	3st Qu	Max
BIR	6.220	10.38	12.95	12.12	14.03	17.54
lnGDP	7.180	9.960	9.900	9.886	10.43	11.40
lnCON	9.240	9.590	9.660	9.840	9.890	12.54
lnINC	8.970	9.260	9.390	9.500	9.620	10.47
YOU	12.80	18.20	24.30	23.40	27.70	34.10
OLD	8.220	12.57	15.14	15.08	17.27	20.60
EDU	0.060	0.080	0.011	0.012	0.012	0.037
URB	30.90	51.90	57.30	59.00	64.60	87.80

Analyzing the nature of the birth rate, the minimum value is 6.22‰ and the maximum value is 17.54‰, nearly twice difference. It can be seen that there are great differences between provinces.

Find the correlation coefficient matrix for each variable, as shown in Table 2 below.

Table 2. Correlation coefficient matrix

	BIR	lnGDP	lnCON	lnINC	YOU	OLD	EDU	URB
BIR	1.0000	-0.1834	-0.4491	-0.3447	0.8739	-0.4083	-0.5223	0.5624
lnGDP	-0.1834	1.0000	0.2582	0.4754	-0.3460	0.6272	0.1553	0.4735
lnCON	-0.4491	0.2582	1.0000	0.7014	-0.5550	0.1771	0.6601	0.7687
lnINC	-0.3447	0.4754	0.7014	1.0000	-0.6120	0.2652	0.7881	0.9323
YOU	0.8739	-0.3460	-0.5550	-0.6120	1.0000	-0.4226	-0.6575	-0.7626
OLD	-0.4083	0.6272	0.1771	0.2652	-0.4226	1.0000	0.1892	0.3808
EDU	-0.5223	0.1553	0.6601	0.7881	-0.6575	0.1892	1.0000	0.8254
URB	-0.5624	0.4735	0.7687	0.9323	-0.7626	0.3808	0.8254	1.0000

From the positive and negative relationship between the birth rate and other explanatory variables in Table 2, it is preliminary verified that the juvenile dependency ratio and urbanization play a positive role, while the economic level, consumption level, old-age dependency ratio and education level play a negative role.

5.3. Stepwise Regression Model

According to the principle of multiple linear regression model, the model is set as:

$$BIR = a_0 + a_1 \ln GDP + a_2 \ln CON + a_3 \ln INC + a_4 YOU + a_5 OLD + a_6 EDU + a_7 URB + \varepsilon$$

Where $a_0, a_1, \cdots, a_7$ is the parameter to be estimated, ε is the random error term, and the sample size is 31.

After importing the data using R studio software, the solution results are as follows:

$$BIR = -35.473 + 0.192 \ln GDP - 4.33 \ln CON + 4.925 \ln INC + 0.413 YOU - 0.080 OLD - 57.363 EDU - 0.078 URB$$
$$(-2.18) \quad (0.49) \quad\quad (-0.66) \quad\quad (2.39) \quad\quad (6.31) \quad\quad (-0.75) \quad (-0.74) \quad\quad (-0.90)$$

The sample size of the model is 31 and the degrees of freedom are 23. From the t-test, we get that when the confidence level is 99%, lnINC, YOU and constant terms all pass the test. The F value of the model is 19.1 and the p value is less than 0.000. The goodness of fit is 0.854 and the modified goodness of fit is 0.809.

Due to the low significance of some variables, considering the existence of multiple collinearities, stepwise regression is used to test and modify the model.

Table 3. Stepwise regression process

Regression model	RSS	AIC
BIR ~ lnGDP + lnCON + lnINC + YOU + OLD + EDU + URB	39.3	23.0
BIR ~ lnCON + lnINC + YOU + OLD + EDU + URB	39.8	21.3
BIR ~ lnCON + lnINC + YOU + EDU + URB	40.4	19.8
BIR ~ lnINC + YOU + EDU + URB	42.2	18.2
BIR ~ lnINC + YOU + URB	42.2	17.5

Therefore, lnINC, YOU and URB are finally selected as model explanatory variables and the model is established as:

$$BIR = a_0 + a_1 \ln CON + a_2 YOU + a_3 URB + \varepsilon ,$$

Where $a_0, a_1, \cdots, a_7$ is the parameter to be estimated, ε is the random error term, and the sample size is 31.

After importing data using R Studio software, the results of running the solution are as follows:

$$BIR = -40.832 + 5.334 \ln INC + 0.422 YOU - 0.129 URB$$
$$(0.004) \quad (0.006) \qquad (0.000) \qquad (0.080)$$

In this model, the sample size is 31 and the degrees of freedom are 27. From the t-test, lnINC, YOU and constant terms all pass the test under the confidence level of 99.9%, and URB 90%. The F value of the model is 47.6 and the p value is less than 0.000, which is greatly improved compared with the original model. The goodness of fit is 0.841 and the modified goodness of fit is 0.823. Finally, the   ability to interpret the data of model has also been enhanced.

5.4. Result Analysis

This model studies the factors affecting the birth rate of the population in 31 provinces and cities in China. The results show that although the economic level, price level and education level all affect the birth rate of the population, due to the interaction between them, some influence of the factors is weakened. According to the analysis of the stepwise regression method, the per capita remuneration, the juvenile dependency ratio and the process of urbanization are the main factors affecting China's birth rate.

Per capita remuneration is the most influential factor. For every unit increase, the birth rate will increase by 5.334%. This result is in line with economics and social behavior. When the per capita pay is higher, they have certain economic conditions, face less pressure to bear children and then have a stronger tendency to bear children.

When the juvenile dependency ratio increases by 1 unit, the birth rate will increase by 0.422 units, indicating that with the increase in the number of children, the population base has been expanded, potentially increasing the birth rate.

Every increase of 1 unit in the urbanization variable will reduce the birth rate by 0.129 units. The higher the level of development in each region, the more education people receive on average, the more avant-garde and advanced idea, and the weaker constraints of traditional concepts, so it is negative to the birth rate.

6. CONCLUSION

This paper studies the birth rate of China's population in a time series and finds that the population policy has a significant effect on the birth rate in a short period of time, especially after the implementation of the "comprehensive two-child" policy in 2016, the population birth rate reached a peak. But the role has basically faded for the next two years, so the population growth rate and birth rate have been declining year by year, and even fell below the pre-policy birth population in 2019. In terms of geographical distribution, it shows spatial difference and clustering. The whole country is divided into four blocks through systematic clustering. Heilongjiang, Liaoning, Tianjin, Shanghai's eastern and northeastern coastal provinces have lower birth rates, while Tibet and Xinjiang always have higher birth rates. The stepwise regression estimation and test results of the econometric model show that the per capita remuneration, the juvenile dependency ratio and the process of urbanization all have a significant impact on the birth rate. Among them, the per capita remuneration and the juvenile dependency ratio have a positive effect on the birth rate. By conyrast, the effect of urbanization process is negative.

In summary, the following recommendations are drawn. From a macro perspective, residents' income and the distribution system should be improved. For couples with children, indirect increase of household income to reduce the cost of childbirth through tax reduction and housing purchase priority. From an individual perspective, the implementation of extended maternity leave or appropriate salary adjustments for contemporary married women during the childbearing age, and taxation of unmarried men and women of appropriate age may help encourge childbirth. In addition, when the birth rate of China turns red again in 2019, a comprehensive liberalization policy can be implemented on a trial basis, especially for some areas with low fertility rates. Combined with the current status of the local economy, social security, education and family living standards, promote regional cooperation to achieve the coordinated development of population, economy and society. Based on the pilot implementation of the policy, targeted adjustments will be made and finally a representative regional population long-term balanced development policy will be formed to achieve the balance of population growth.

REFERENCES

[1] D. Ren and P. Li (2015). Factors and Policy Choices of the Population Birth Rate: 1994~2014. Ad Hoc Networks, vol.10, p.23-31.

[2] G.J. Wang, X.J. Zhao and X.F. Zhou (2016). Empirical research on factors affecting the population birth rate in China. Economic Problems, vol.2, p.7-11.

[3] B.H. Wang (2017). Multivariate statistical analysis and modeling for R language. Guangzhou, Ji 'nan University Press.

[4] S.C. Li and S.Y. Zhang (2008). Analysis of factors influencing birth rate based on stepwise regression method. Statistics & Decision, vol.4, p.7-9.

[5] J.W. Li (2014). The influencing factors of birth rate and its development trend in China. The Development Research, vol.9, p.71-78.

[6] D.H. Wang and X.D. Li (2017). Spatial measurement of birth rate and its influencing factors in China. Geographical and Environmental Sciences, vol.35, no.6, p.66-71.