



# Analysis of the Factors Influencing the Employment Prospects of College Students under the New Economic Normal--Human Resource Management as an Example

Nuo Chen, Ying Li, Jiaxin Chen and Jing Chen\*(✉)

Chengdu University of Information Technology, Chengdu, 610103, China  
\*jchjoy@cuit.edu.cn

**Abstract.** The employment situation under the new economic normal is severe, which has a certain impact on the employment of college students. In this study, a regression model was established using principal component analysis in the context of the new normal of economic development. A quantitative analysis was conducted on five-dimensional factors, namely, birth rate, enrollment in higher education institutions, the number of graduates from higher education institutions, GDP, and urban registered unemployment rate, to study the degree of influence of the five-dimensional factors on the employment prospects of college students. Human resource management majors were selected for model testing, and it was concluded that the five-dimensional factors fit well, the correlation between each dimensional factor is strong, the employment prospects of human resource management majors are developing in a better state, and the employment situation is good.

**Keywords:** Economic Normal, Employment Prospects, Influencing Factors, Principal Component Analysis, Human Resource Management.

## 1 Introduction

**Problem formulation.** The impact of the subprime mortgage crisis in the United States has exerted a certain impact on China's economy, and China has made corresponding policy adjustments to deal with the crisis. In 2013, the concept of "new normal of economy" was put forward. In 2014, the Central Economic Work Conference pointed out that China's economy "is shifting from high-speed growth to medium-high growth, the mode of economic development is shifting from extensive growth based on scale and speed to intensive growth based on quality and efficiency, and the economic structure is shifting from incremental expansion to in-depth adjustment of both adjusting stock and improving increment. The driving force of economic development is shifting from traditional growth points to new growth points [1]. Our country's economic development entered the new normal in the same year in 2014. At the same time, the "Belt and Road" initiative proposes to "rebuild" the Silk Road and develop it in depth in the following years to form a vast economic development network. The escalation of trade frictions between China and the United States in 2018

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once again challenged China's economic development, but the country was able to achieve stable economic growth in this environment, thanks to its ability to cope with the crisis [2]. In 2020, the outbreak and spread of COVID-19 caused another shock to the global economic environment. China implemented active epidemic prevention measures and achieved phased results, encouraged domestic economic development and achieved positive economic growth [3][4]. Achieve positive economic growth, but the international economic environment is not optimistic, and there is still a great threat to our country. In the background of times with both opportunities and challenges, China's economy is still able to maintain a stable and positive trend. It presents three major characteristics of economic development of economic growth at a reduced rate, optimization of economic structures, and transformation of the momentum of economic growth [5].

Under good economic conditions, a large number of jobs should have been created to meet employment needs, but in the process of combing through the literature, it was found that the employment situation at this stage is not ideal and the employment situation is severe, specifically: first, economic transformation and development upgrading, the economic growth slows down, and jobs creation is slowed [6]. Second, the structural transformation of economic development, the pursuit of high-quality development, the structural reform on the supply side, some industries are forced to adjust, there is redundant labor (due to the development of production and the progress of technology, the labor production efficiency is improved, the required labor force is reduced, and the surplus labor force is increased.), and the structural unemployment rate increases [7]. Third, the transformation of the old and new dynamics, from factor-driven and investment-driven to innovation-driven, has reduced employment space and increased competition in the job market [5]. At the same time, there are vacancies of innovative talents and lack of professional talents [8]. The economic development accelerates China's urbanization process, and there is a large surplus of rural labor. In addition to the reduction of jobs under the new economic normal, the demand for labor is smaller than the supply, and the situation cannot be completely solved in a longer period of time. The employment situation under the new economic normal is severe, and job positions are reduced, which will certainly lead to increased competitive pressure for employment.

Economic development cannot be achieved without the support of education and feeds back to education. The high speed and high-quality development of the economy has promoted the popularization of higher education, and the number of graduates from higher education institutions has been increasing year by year. According to official statistics, the total scale of college graduates in 2021 reaches 9.09 million, an increase of 350,000 year-on-year [9]. The increase in the number of college graduates inevitably makes the employment group expand and increases the pressure on the employment market. At this stage, the employment contradiction is prominent, the capacity of the employment market is limited, it is difficult to achieve full employment, and the employment prospect is worrying. Based on this, this study uses principal component analysis to analyze the degree of influence of five-dimensional factors, namely birth rate, enrollment in higher education institutions, number of graduates from higher education institutions, GDP and urban registered unemployment rate, on

the employment prospect of college students in the context of the new normal economic development, to establish a model of the index system affecting the employment prospect of college students, and to predict the employment prospect of college students.

## 2 Problem Assumptions

Employment prospect, also known as employment situation, refers to the relationship between labor demand and labor supply in an industry in the context of government macro and micro-policy, and can reflect the changing status of the relationship within a time period and foresee the development trend of the industry [10]. Factors such as national political and economic conditions, employment market supply relationship, social development conditions, and industry development all affect employment prospects. By collating the literature, we found that two big factors, demographic structure [11][12] and economic situation, would have an impact on employment prospect [5][6][7][8]. Furthermore, we extracted five-dimensional factors, namely, birth rate of population, enrollment of higher education institutions, number of graduates from higher education institutions, GDP and urban registered unemployment rate, and used quantitative analysis to study the degree of influence of the five-dimensional factors on the employment prospects of college students. To ensure the precision of the research results and the rigor of the study, the following assumptions were made prior to the study.

1. Assuming entry to university at age 18, completion of all studies and graduation within 4 years.
2. The correspondence of data related to the birth rate and the number of enrollment in higher education institutions has a time lag of 18 years.
3. There is a 4-year time lag in the correspondence between the data related to the number of first time students enrolled in higher education and graduates from higher education institutions.

## 3 Empirical Study

### 3.1 Data Pre-processing

The data of the dimension factors of this study: birth rate, enrollment in higher education institutions, graduates from higher education institutions, GDP, and urban registered unemployment rate are all original data from the National Bureau of Statistics; and the corresponding data are selected with the research assumptions, in which the data of birth rate are from 1994-1998, the data of enrollment in higher education institutions are from 2012 -2016, the data of the number of graduates from higher education institutions, GDP, and urban registered unemployment rate are all from 2016-2020, and the data in Table 1 are obtained through collation.

**Table 1.** Summary Table of Data Composition.

Year	Population birth rate (‰)	Number of students enrolled (10,000)	Number of graduates (million)	GDP (billion yuan)	Unemployment rate (%)
2020	15.64	748.6	797.1991	1013567.0	4.2
2019	16.57	737.8	758.5298	986515.2	3.6
2018	16.98	721.4	753.3000	919281.1	3.8
2017	17.12	699.8	735.8000	832035.9	3.9
2016	17.70	688.8	704.2000	746395.1	4.0

(Note: Data from the National Statistical Office: annual data; Notes Data from the National Statistical Office: annual data; <https://data.stats.gov.cn/easyquery.htm?cn=C01>)

### 3.2 Model Construction

Principal component analysis refers to the rearrangement of multiple factor indicators with certain connections to form new comprehensive indicators by dimensionality reduction, and the internal relationship between multiple variables is found by counting the correlation between them. Find several principal components from the original variable to express as much information as possible about the original variable, but the principal component is not related to the variable. The principal components are not correlated with each other. Using SPSS 26.0, the principal component analysis was adopted to analyze the correlations of each dimensional factor.

**Table 2.** Common factor variance table.

Dimensional factors	Initial	Extraction
Population birth rate	1	0.988
Number of students	1	0.984
Number of graduates	1	0.985
GDP	1	0.999
Unemployment Rate	1	0.998

The values of each common degree of the extracted factors in Table 2 are greater than 0.5, then the extracted principal components explain a high degree of the original variables.

As can be seen from Table 3, the two main components with eigenvalues greater than 1 were extracted, and the variance contribution of the two principal components was 77.320% and 21.792%, respectively, and the cumulative variance contribution was 99.112%, which exceeded 80%, this indicates that the two indicators could be used for evaluation; the two eigenvalues were 3.866 and 1.090, respectively.

**Table 3.** Total variance decomposition table.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.866	77.320	77.320	3.866	77.320	77.32	3.836	76.722	76.722
2	1.090	21.792	99.112	1.090	21.792	99.112	1.120	22.390	99.112
3	0.029	0.578	99.690						
4	0.016	0.31	100						
5	-1.59E-16	-3.18E-15	100						

**Table 4.** Factor cut-off load matrix A.

	Ingredients	
	1	2
Population birth rate	-0.981	-0.162
Number of students	0.980	-0.152
Number of graduates	0.990	0.077
GDP	0.970	-0.240
Unemployment Rate	0.148	0.988

Through the knowledge of mathematical statistics, the transformation matrix of the analysis of principal components, i.e., the loading matrix of principal components U, is mathematically related to the factor truncation matrix A (see Table 4) and the eigenvalues  $\lambda$  as follows.

$$U_i = A_i / \sqrt{\lambda_i}$$

(i.e., principal component 1 score = factor 1 score divided by the arithmetic square root of 3.866; principal component 2 score = factor 2 score divided by the arithmetic square root of 1.090.)

The principal component load matrix U is obtained by calculation, the results are shown in Table 5.

**Table 5.** Principal component load matrix U.

Dimensional factors	1	2
Population birth rate	-0.499	-0.155
Number of students	0.498	-0.146
Number of graduates	0.504	0.074
GDP	0.493	-0.230
Unemployment Rate	0.075	0.946

### 3.3 Model Establishment

The expressions were created by the relationship to obtain the expressions for the two main components F1 and F2.

$$F1 = -0.499X1 + 0.498X2 + 0.504X3 + 0.493X4 + 0.075X5$$

$$F2 = -0.155X1 - 0.146X2 + 0.074X3 - 0.230X4 + 0.946X5$$

The weighted average operation is then performed with the contribution of the principal components as weights to obtain the expression of the principal component scores.

$$F = (77.32 * F1 + 21.792 * F2) / 99.112$$

Where X1 = population birth rate, X2 = enrollment in higher education, X3 = graduation from higher education, X4 = GDP, and X5 = unemployment rate; the variables used in F1 and F2 are normalized original variables.

### 3.4 Model Runs

To test the accuracy of the model, human resource management majors were selected for testing. The information search revealed that there was a lack of data related to human resource management majors, but by reviewing the information, we learned that a total of about 470 higher education schools offer human resource management majors, with the size generally ranging from a few dozen to more than a hundred students. By calculating the ratio of enrollment in human resource management majors to the total number of students enrolled each year, the basic conclusion was drawn: 1.3% to 1.6% per 10,000 students enrolled in human resource management majors. Taking this as the basic theoretical basis and considering the impact of uncertainties on the study, 1.45% was selected as the calculation standard, and the data in Table 6 was collated.

**Table 6.** Summary Table of Data Composition.

Year	Population birth rate (‰)	Number of students enrolled (10,000)	Number of graduates (million)	GDP (billion yuan)	Unemployment rate (%)
2020	15.64	10.85	11.56	1013567.0	4.2
2019	16.57	10.70	11.00	986515.2	3.6
2018	16.98	10.46	10.92	919281.1	3.8
2017	17.12	10.15	10.67	832035.9	3.9
2016	17.70	9.99	10.21	746395.1	4.0

The data in Table 6 were normalized to obtain Table 7.

**Table 7.** Normalized data of dimensional factors.

Year	Population birth rate (%)	Number of students enrolled (10,000)	Number of graduates (million)	GDP (billion yuan)	Unemployment rate (%)
2020	-1.51818	1.16241	1.39634	1.03042	1.34164
2019	-0.30311	0.74727	0.25978	0.78592	-1.34164
2018	0.23256	0.08303	0.09742	0.17825	-0.44721
2017	0.41548	-0.77494	-0.40997	-0.61028	0
2016	1.17326	-1.21777	-1.34357	-1.38432	0.44721

The corresponding indicators for each year subdivision were obtained by calculating.

$$F_{2020} = 1.90, F_{2019} = 0.70, F_{2018} = 0.05, F_{2016} = -0.81, F_{2015} = -1.84$$

### 3.5 Analysis of Model Operation Results

Using the model to analyze the employment prospects of human resource management majors, a quantitative analysis was conducted on five-dimensional factors: population birth rate, enrollment in higher education institutions, number of graduates from higher education institutions, GDP and urban registered unemployment rate, and the interaction between the five factors, which together affect the employment prospects of human resource management majors.

1. The birth rate factor has a negative correlation effect on the employment prospects of college students. When other possible influencing factors remain unchanged, the birth rate shows a negative growth and the growth rate of the new population slows down, which to some extent reduces the pressure of higher education enrollment for these groups. At the same time, the number of college graduates is correspondingly reduced, and the pressure of workplace competition is reduced, which makes college students have more autonomy in choosing careers, improves employment satisfaction, and has better employment prospects.

2. There is a positive relationship between the number of students enrolled in institutions of higher learning and the number of graduates, which also has a positive impact on the employment prospects of university students. Colleges and universities as the employment market talent training base, in order to meet the needs of the employment market, scientific formulation of talent training programs and teaching plans. The increase in the number of students enrolled in colleges and universities provides more young people of the right age with the opportunity to learn professional knowledge or skills in a certain field. The increase in the number of enrollment of human resource management major enables more employed people to learn theoretical knowledge and practice skills, and have professional theoretical knowledge and excellent skills, which can enhance employment competitiveness. However, it is necessary to consider the simultaneous increase of enrollment number and graduation number of colleges and universities, and the large influx of employed people into the

employment market, which to some extent intensifies the employment pressure in the employment market.

3. Economic development has a positive effect on the employment prospects of college students. Under the background of the new normal of economy, high-quality economic development and medium-high speed growth, on the one hand, the adjustment of economic structure and industrial transformation and upgrading have put forward new requirements for talents, and the role of human resource management related positions is more prominent, and employment opportunities are increased; On the other hand, the steady and positive trend of the economy has prompted operators to increase funds to invest in production and expand the scale of enterprises, which has provided more employment opportunities for job seekers majoring in human resource management. Compared with the employed population without higher education, college students majoring in human resource management with higher education have higher professional skills and professional quality, more career choices, less employment resistance, and better employment prospects. At the same time, economic development and the job market influence and interact with each other. Economic development provides more job opportunities, and the good situation of the job market development will also promote economic development, forming a virtuous cycle, and ultimately making the employment prospects better and better.

4. The registered urban unemployment rate is a direct reflection of the employment market, and it is also an indicator to measure the economic development and the utilization degree of talents in a period. Unemployment includes five major categories: frictional unemployment, structural unemployment, seasonal unemployment, cyclical unemployment, and involuntary unemployment. The registered urban unemployment rate is the sum of the above five categories of unemployment rate. Through the above mathematical analysis of the urban unemployment rate, it is not difficult to find that the registered urban unemployment rate floats in the stable range, which reflects the relatively stable employment market, good economic development, full utilization of human resources and reasonable allocation of resources.

## 4 Summary

Through the literature review and analysis, this study obtains the dimensional factors that affect the employment prospects of college students. The principal component analysis method is used to analyze the influence degree of five dimensions of the birth rate, the enrollment number of colleges and universities, the number of colleges and universities graduates, GDP and urban registered unemployment rate on the employment prospects of college students, and the index system model of influencing the employment prospects is established.

In the course of the study: there is a negative relationship between birth rate and employment prospects, with lower birth rate and lower employment prospects. The number of students enrolled in institutions of higher learning, the number of graduates from institutions of higher learning, GDP, and the registered urban unemployment rate are positively related to employment prospects. Under the premise of full em-



ployment in the employment market, the population growth rate will slow down, reducing the competitive pressure in the future employment market. The increase of the number of students in colleges and universities makes the number of graduates rise accordingly, and the employment pressure caused by the joint action of the two will offset the employment advantage of talents; The good situation of economic development provides and generates more employment opportunities, and the registered urban unemployment rate directly reflects the economic development. The model can be simplified to understand: the decline in the birth rate and the large number of jobs brought by the stable economic development can offset the employment pressure brought by the increase in the number of higher education enrollment and graduates, stabilize the unemployment rate, and finally make the human resource management major have a good employment prospect.

The principal component analysis method can effectively avoid the multicollinearity problem between variables, eliminate the correlation between evaluation indicators, and improve the estimation accuracy of the model. However, the issue of employment prospects is complex and has many influencing factors, which cannot be fully considered when modeling. For example, the number of jobs added after the implementation of the employment policy cannot be clearly calculated, the hidden changes in employment after the implementation of the economic policy cannot be quantified, there is a time lag between the number of new people and the number of people entering the job market, and the external situation cannot be clearly predicted. Therefore, the model has some limitations in its application.

## References

1. Network of Communist Party members, <https://news.12371.cn/2014/12/11/ARTI1418295777211338.shtml>, last accessed 2016/12/11.
2. Wenpu Li, Min Gong, Huakun Wu, Yanwu Wang, Zhiyuan Lin: Judgment of China's economic growth trend under the background of trade frictions: China's macroeconomic re-outlook from 2018 to 2019. *Journal of Xiamen University (Philosophy and Social Sciences Edition)* 250(06), 84–92 (2018).
3. Jia Wang, Zhenyu Yang, Zhifang Liu: Global economic growth and macroeconomic policy options under the normalization of epidemic prevention and control. *Journal of Inner Mongolia Electric University* 189(05), 3-7 (2021).
4. Zicheng Rong: 2020 novel crown pneumonia epidemic prevention and control and China's economic outlook. *Chinese market* 1059(32), 14-16 (2020).
5. Sitao Lin: Changes in China's employment situation and policy innovation under the new normal of the economy. *Zhongzhou Academic Journal* 218(02), 82-85 (2015).
6. Fengqiu Yao: Analysis of employment situation and policy reform under the background of the new normal economy. *Rural economy and science and technology* 32(04), 182-183 (2021).
7. Shan Peng: Research on China's employment situation and policy reform under the new normal of the economy. *Modern business* 452(07), 61-62(2017).
8. Tianming Chen, Hehua Wang, Yong Tian: The employment situation of college students under the new normal of economic development is discussed. *Chinese Business Theory* 719(16), 247-248 (2019).

9. Ministry of Education of the People's Republic of China, [http://www.moe.gov.cn/jyb\\_xwfb/xw\\_zt/moe\\_357/2021/2021\\_zt08/hd/yw/202105/t20210531\\_534363.html](http://www.moe.gov.cn/jyb_xwfb/xw_zt/moe_357/2021/2021_zt08/hd/yw/202105/t20210531_534363.html), last accessed 2021/5/31.
10. MBA Think Tank Encyclopedia, <https://wiki.mbalib.com/wiki/>, last accessed 2022/10/22.
11. Yeliang Xia: China's demographic changes and employment prospects. *Strategy & Management* 02, 93-100 (2001).
12. Fang Han, Qi Lv, Xiaoyang Wang: Analysis of the impact of demographic changes on employment situation in Henan. *Human resource development* 274(01), 36-37 (2014).

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