

Predictive Modeling Using Logistic Regression on New Media Data for College Student Entrepreneurship

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Abstract. With the rapid development of new media technology, returning to their hometown for employment has gradually become an important choice for college students, alleviating the employment pressure in big cities and injecting new impetus into regional economic development. This paper takes 287 college students from three universities in the northern district of Zhengzhou as the survey objects, collects data through a questionnaire survey and uses descriptive statistical analysis, chi-square test and logistic regression analysis to explore the current situation and influencing factors of college students returning to their hometown for employment under the background of new media. The study found that: first, college students have a low willingness to return to their hometown for employment, which is mainly affected by insufficient infrastructure in their hometown, low policy awareness, and unclear career planning; second, college students prefer stable jobs and have a weak willingness to start a business; third, satisfaction with hometown development, family support and the practice of “three going to the countryside” are key influencing factors.

Keywords: new media, college students, returning entrepreneurship, chi-square test, logistic regression

1 Introduction

In recent years, the Chinese government has introduced a series of policy documents to encourage the return of migrant workers and college students to their hometowns for entrepreneurship as part of a broader effort to promote rural revitalization and ease urban employment pressure. The Guiding Opinions on Supporting Migrant Workers and Other Groups to Return to Their Hometowns for Entrepreneurship (2015) emphasized the need to improve policy support, optimize the entrepreneurial environment, and mobilize grassroots innovation. In 2020, the National Development and Reform Commission released the *Opinions on Promoting High-Quality Development of Rural Entrepreneurship*, further calling for stronger institutional mechanisms and service guarantees. These national policies reflect the increasing strategic significance placed on grassroots entrepreneurship as a key driver of rural revitalization and economic rebalancing.

However, despite the momentum of policy support, the practical outcomes of college students returning to their hometowns to start businesses remain less than ideal. Many students face significant challenges, including limited entrepreneurial capabilities, lack of social capital, low policy awareness, and underdeveloped local infrastructure. As recent studies have shown, even among students who attempt to start businesses in their hometowns, many encounter failure after substantial personal investment. This reality highlights the gap between the policy ambition and the practical barriers students face on the ground. Simultaneously, the rapid development of new media technology has transformed how college students access information, form career expectations, and pursue employment or entrepreneurial opportunities. Digital platforms such as social media, short video apps, and online job portals expand informational access and reshape perceptions of career viability and regional attractiveness. However, the specific role of new media in influencing students' decisions to return to their hometowns remains insufficiently explored — especially in localized and policy-sensitive contexts like Zhengzhou. As the capital city of Henan Province, Zhengzhou serves as a representative urban center with a high density of universities and a substantial student population. Its position at the urban and rural development interface makes it an appropriate case for examining the interplay between policy environments, personal and familial factors, and media influence. Against this background, the present study employs logistic regression analysis based on a

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survey of 287 college students from three universities in Zhengzhou's northern university district. The aim is to investigate the multi-dimensional factors — individual, familial, social, and policy-related — that affect college students' willingness to return to their hometowns for employment and entrepreneurship.

This study, therefore, aims to investigate the factors affecting college students' willingness to return to their hometowns for employment under the lens of **new media influence**. Based on a questionnaire survey of 287 students across three universities in Zhengzhou's northern university town, the research employs descriptive statistical analysis, chi-square testing, and logistic regression modeling to identify key individual, familial, societal, and policy-related factors. This paper attempts to bridge the gap between macro-level policy intent and micro-level behavioral patterns by introducing new media as a variable into the traditional employment analysis framework.

2 Related Works

In recent years, with the advancement of the rural revitalization strategy and the “double entrepreneurship” policy, returning to hometown for employment has gradually become one of the important choices for college students. Chen and Chen [1] pointed out that returning to hometown for employment can not only alleviate the employment pressure in big cities but also inject vitality into local economic development. Chen [2] emphasized the key role of policy support in promoting returning to the hometown for employment and suggested that the government provide more employment opportunities and entrepreneurial support. Studies have shown that the factors influencing college students returning to their hometowns for employment are complex and diverse, covering multiple levels such as individuals, families, society, and policies. Lv [3] found that family background, personal values, employment opportunities and policy support are the main factors affecting the willingness of rural college students to return to their hometowns for employment. Chen et al. [4] further pointed out that the economic development level of the hometown, employment opportunities, and family support have a significant impact on the willingness of college students to return to their hometowns. These findings highlight the multi-faceted nature of the factors influencing college students' decisions to return to their hometowns for employment. However, they also reveal that the interplay between these factors and the specific role of new media in this context requires further exploration.

The rapid development of new media technology has provided new channels and platforms for college students' employment. Cable and Yu [5] and Walker [6] pointed out that new media technology has changed the traditional way of disseminating employment information. College students can obtain more employment information through social media and recruitment websites. Li [7] analyzed the methods of employment surveys under the background of new media from the perspective of sampling technology and emphasized the application value of new media technology in employment market surveys. While the potential of new media technology in facilitating employment opportunities is evident, its specific influence on college students' decisions to return to their hometowns for employment remains under-researched, particularly in the context of regional-specific factors.

Logistic regression is a statistical analysis method widely used in classification problems, especially when the dependent variable is binary. Lawal and Lawal [8] introduced in detail how to use SPSS to process categorical variables in logistic regression, pointing out that logistic regression can effectively analyze the impact of multiple independent variables on the dependent variable. Ruscio and Mullen [9] explored the effectiveness of the logistic regression model in classification problems through ROC curve analysis. Regarding the application of logistic regression in employment research, Jeong et al. [10] studied the influencing factors of road traffic accidents based on the logistic regression model and pointed out that this method can effectively identify the complex relationship between multiple influencing factors. Similarly, the logistic regression model has also been widely used in employment research. Ragazou [11] analyzed the employment data of college graduates nationwide and used the logistic regression model to identify the main factors affecting the return of college graduates to their hometowns for employment. They found that family background, employment opportunities, and policy support are important factors affecting the willingness to return to their hometowns. Despite the prevalence of logistic regression in employment research, its application to the specific context of college students returning to their hometowns for employment in the new media era presents a novel and promising avenue for investigation.

Although many studies have explored the influencing factors of college students returning to their hometowns for employment, the impact of social media and online platforms on employment choices in the context of new media still needs to be further analyzed. In addition, most existing studies focus on the whole country or specific regions, and there are few empirical studies on the return of college students in Zhengzhou to their hometowns for employment. Therefore, based on the logistic regression model and combined with the background of new

media, this paper explores the factors that influence the return of college students in Zhengzhou to their hometowns for employment to provide a reference for local governments to formulate policies.

3 Research Design

3.1 Research Purpose

This study aims to explore the influencing factors of the return of college students in Zhengzhou to their hometowns for employment under the background of new media and analyzes the influence mechanism of multi-dimensional factors such as individuals, families, society, and policies on the willingness of college students to return to their hometowns for employment through a logistic regression model. The study aims to provide a theoretical basis for local governments to formulate policies to promote the return of college students to their hometowns for employment, and at the same time, provide a reference for the employment guidance work of colleges and universities, help alleviate the employment pressure in large cities, and promote the balanced development of the regional economy.

3.2 Research Subjects

The research subjects of this paper are college students in Zhengzhou Beidacheng. The reason for choosing this group as the research object is that Beidacheng concentrates on many colleges and universities with a wide range of students and has strong representativeness, which can more comprehensively reflect the current situation and influencing factors of college students returning to their hometowns for employment under the background of new media.

3.3 Research Methods

This paper adopts the following research methods:

- (1) Questionnaire method: Design a scientific and reasonable questionnaire, conduct a random sampling survey on college students in the Peking University Town and collect data on their willingness to return to their hometowns for employment and related influencing factors.
- (2) Reliability analysis: Conduct a reliability analysis on the questionnaire content and use Cronbach's α coefficient to test the internal consistency of the questionnaire to ensure the reliability and validity of the questionnaire data.
- (3) Descriptive statistical analysis: Conduct a descriptive statistical analysis on the current situation of college students returning to their hometowns for employment, including basic characteristics such as the proportion of willingness to return to their hometowns for employment, gender distribution, and major distribution.
- (4) Chi-square test: Use the chi-square test to analyze the correlation between categorical variables (such as gender, family background, policy cognition, etc.) and college students' willingness to return to their hometowns for employment. Preliminarily screen for significant influencing factors.
- (5) Logistic regression analysis: Based on the results of the chi-square test, construct a logistic regression model to further analyze the degree and direction of each influencing factor's influence on college students' willingness to return to their hometowns for employment and identify key influencing factors.

3.4 Data Source

This survey targets full-time college students from three universities in the northern district of Zhengzhou (Zhengzhou Normal University, Zhongzhou University, and Henan Animal Husbandry and Economics College). Compiling a detailed sampling frame is difficult since the total number of units N is known but not unique. Therefore, the regional sampling frame method is adopted. Through subjective judgment, the northern university

town of Zhengzhou is selected as the sampling unit, and three universities are determined as the sampling frame. Three hundred twenty questionnaires were distributed and 287 valid questionnaires were collected, with an effective recovery rate of 89.6%.

3.5 Questionnaire Design

(1) Basic Information

The main contents of this questionnaire survey include five parts: basic personal information of college students, degree of cognition, reasons for willingness, treatment requirements, and expected external support. The questionnaire framework structure is presented in Table 1.

Table 1. Questionnaire framework structure

	Question classification	Corresponding question number
College students' willingness to return home	Basic information	1—8
	Cognition level	9—16
	Expected external support	17—22

(2) Quantitative analysis of sample size

In the selection of sample size, simple random sampling without replacement without considering the order is adopted. The relationship between the absolute allowable error d in the probability sense of the estimator and the standard deviation $SE(\theta)$ or the coefficient of variation $CV(\theta)$ of the estimator is used. For a given accuracy, the minimum sample size required can be obtained. The calculation formula for the total sample size n is shown as Equation (1).

$$n = \frac{Z^2 p(1-p)}{d^2} = \frac{1.96^2 \times 0.5 \times (1-0.5)}{0.05^2} = 384.16 \tag{1}$$

Where: Z is the critical value of the Z statistic corresponding to a certain probability, p is the expected value of the proportion of the target population, and the value is 0.5 to obtain a relatively conservative sample size. The sample size is the largest, and d is the error limit of $\pm 5\%$.

Finally, the design effect coefficient $deff$ is introduced to determine the effect of sample design, which is 0.67. At the same time, considering the changes in the survey subjects, it is assumed that the proportion of invalid questionnaires is 10% based on experience. Then, the total sample size is shown as Equation (2).

$$n = \frac{n_0 \times deff}{p_1} = \frac{384.16 \times 0.67}{0.9} \approx 286 \tag{2}$$

(3) Principle of sample size allocation

First, stratify according to the determined sample frame, and then use the proportional allocation method to determine the sample size of each layer. The sample size of each layer is shown in Table 2.

Table 2. Sample size of each layer

Layer/h	Layer right/ W_h	Total number of people/	Sample size/person
1	0.25	15243	70
2	0.25	15069	70
3	0.50	32000	146

From the above table, we can get:

$$N_1 = 15243, N_2 = 15069, N_3 = 32000, N = 62312$$

The weight and sampling ratio of each layer are shown as Equations (3)-(5).

$$W_1 = \frac{N_1}{N} = \frac{15243}{62312} \approx 0.2446 \quad (3)$$

$$W_2 = \frac{N_2}{N} = \frac{15069}{62312} \approx 0.2418 \quad (4)$$

$$W_3 = \frac{N_3}{N} = \frac{32000}{62312} \approx 0.5135 \quad (5)$$

The sample size of each layer is shown as Equations (6)-(8).

$$\begin{cases} n_1 = W_1 n \approx 0.2446 \times 286 \approx 70 & (6) \\ n_2 = W_2 n \approx 0.2418 \times 286 \approx 70 & (7) \\ n_3 = W_3 n \approx 0.5135 \times 286 \approx 146 & (8) \end{cases}$$

That is, the sample sizes of each layer are 70, 70, and 146 respectively.

4 Data Analysis and Results

4.1 Reliability and Validity Analysis

Reliability refers to the degree of consistency of the results obtained when the same method is used to repeat the measurement of the same object. The reliability index is evaluated by Cronbach's alpha reliability coefficient, which is the most commonly used reliability coefficient, and its formula is as follow Equation (9).

$$\alpha = \frac{n}{n-1} \times (1 - \sum Si^2) / ST2 \quad (9)$$

Table 3. Questionnaire Reliability Results

α	n
0.631	12

As shown in Table 3, the data was calculated by SPSS software to produce an alpha value of 0.631; according to the criteria, it can be concluded that the survey has a basis of trust, and the reliability of the reliability is still good. Validity refers to the degree to which a measurement tool or instrument can accurately measure what it is intended to measure. There are three types of validity: Face Validity, Criterion Validity, and Construct Validity. Multiple methods of validity analysis reflect different aspects of validity. The KMO is a validity test for principal component analysis (0.5 and up means getting better; below 0.5 should be discarded). In order to ensure the effectiveness of the content and structure design, before the questionnaire was distributed, a validity test of its content, structure, and degree of difficulty was carried out, and improvements were made based on the feedback to form the final questionnaire.

4.2 Descriptive Statistical Analysis

(1) Gender and Grade Distribution of the Sample

The gender distribution of the sample is shown in Fig. 1 and the grade distribution of the sample is shown in Fig. 2. Among the valid samples returned this time, we can see that the proportion of females accounts for 58% and the proportion of males accounts for 42%. We mainly take undergraduate students in the three schools in North University City as the sample in this survey for four grades. The first two years of college students are not thinking about employment much, the number of third-year students is higher, and the fourth-year college students participate in more internships, so the data is more typical.

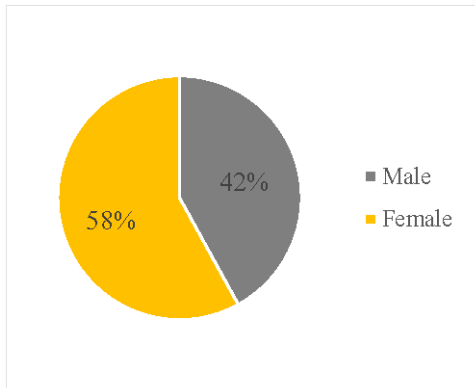


Fig. 1. Gender distribution of the sample

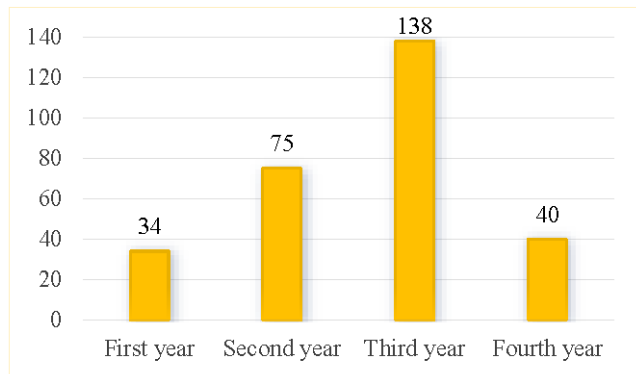


Fig. 2. Grade distribution of the sample

(2) Analysis of willingness to return to hometown for employment

By analyzing the employment intention of 287 college students, we know that 129 college students were willing to return to their hometowns for employment, accounting for 44.95%. The number of college students who were unwilling to return to their hometowns for employment is 158, accounting for 55.05%. We can see that the number of college students who are willing to go back to their hometowns for employment is less than the number of college students who are not willing to go back to their hometowns for employment, i.e., the willingness of the college students in BeiDaCheng City to go back to their hometowns for employment is low.

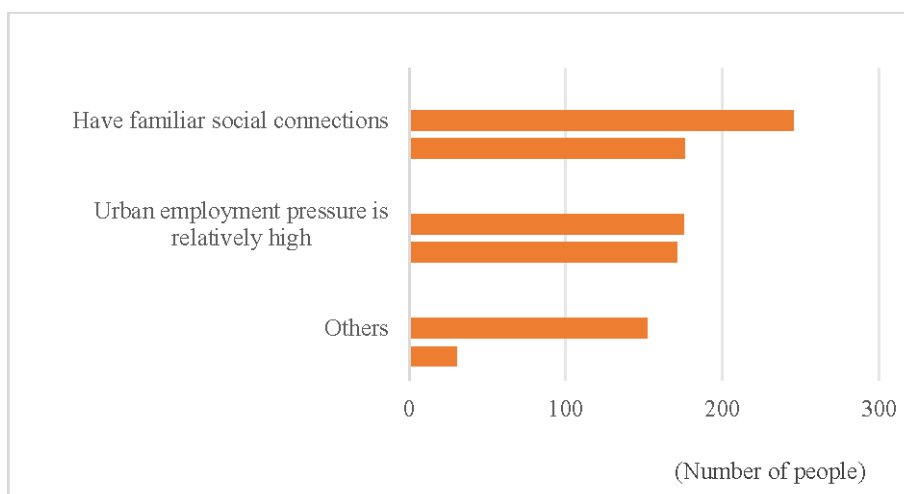


Fig. 3. Tendency of reasons for returning home for employment

The tendency of reasons for returning home for employment is illustrated in Fig. 3. It can be seen that taking care of parents is the most important reason why college students are willing to return to their hometowns for employment, which shows that most college students consider their responsibilities. Returning to their hometowns for employment allows them to have familiar social relations and avoids the fear of an unfamiliar environment after graduation.

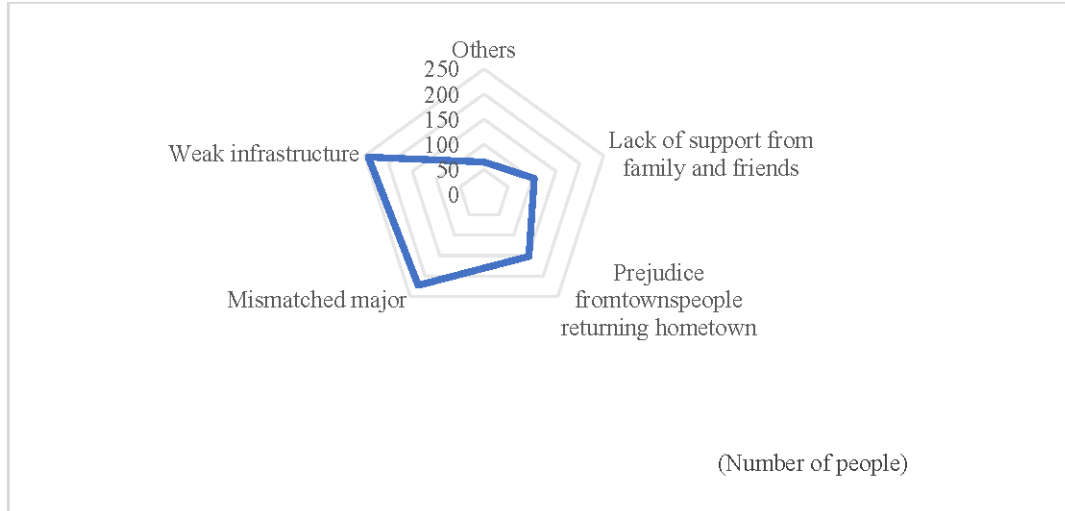


Fig. 4. Reasons for not wanting to return home for employment

From the above Fig. 4, we show the reasons for not wanting to return home for employment. There are two main reasons for college students' reluctance to return to their hometowns for employment: one is the development of their hometowns and the other is to engage in their specialties. The weak infrastructure in their hometowns is the main reason college students are reluctant to return for employment, and the lack of employment opportunities and the lack of matching specialties are the secondary reasons why college students are reluctant to return. The lack of support from family and friends and the prejudice of people in their hometowns against returning for employment all affect the students' willingness to return to their hometowns for employment after graduation.

(3) Preference for Type of Workplace

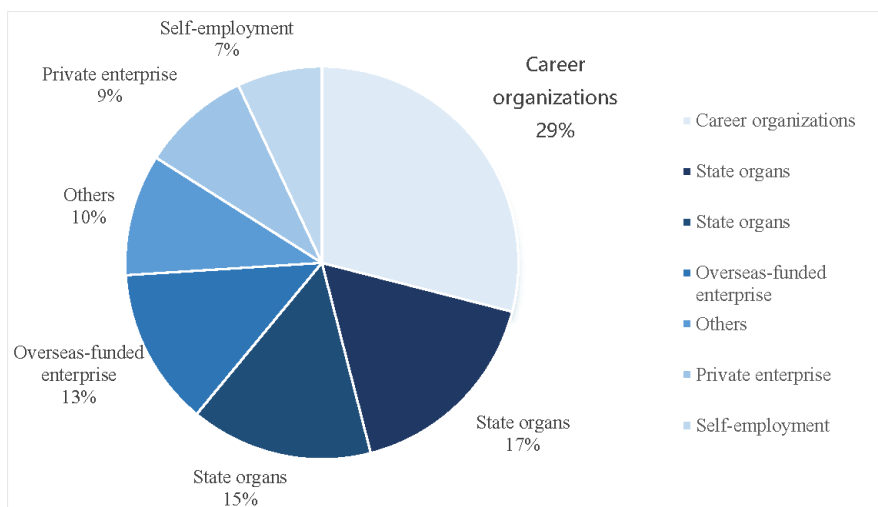


Fig. 5. Sample Preferred Workplace

In the survey of 287 valid samples in Zhengzhou City North University Town, 29.27% of the students tended to choose career organizations after graduation. 16.38% of college students chose state organizations, and the number of people who chose was only second to the career units. The proportion of those who prefer state-owned enterprises is 15.33%, and self-employment only accounts for 7.72%, indicating that most college students prefer more stable job opportunities and have a low sense of entrepreneurship. The preferred workplace types as shown in Fig. 5.

(4) Knowledge of hometown employment policies

The level of knowledge of the policy among the sample is depicted in Fig. 6. The college students who do not know much about the policies of their hometowns account for 55.66%, which is a high proportion. The proportion of college students who generally understand the policies of their hometowns is 29.27%, and the proportion of those who do not understand the policies of their hometowns is 14.63%. Only 2.44% of them know the policies of their hometown very well. It shows that college students do not pay much attention to their hometown's employment policies and cannot learn about favorable employment policies.

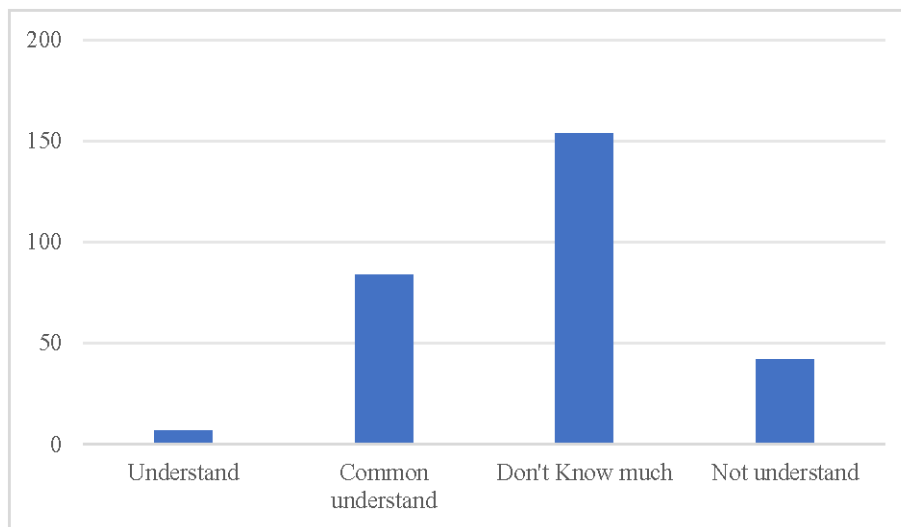


Fig. 6. Sample of the level of knowledge of the policy

(5) External support for college students' expectations of returning to their hometowns for employment

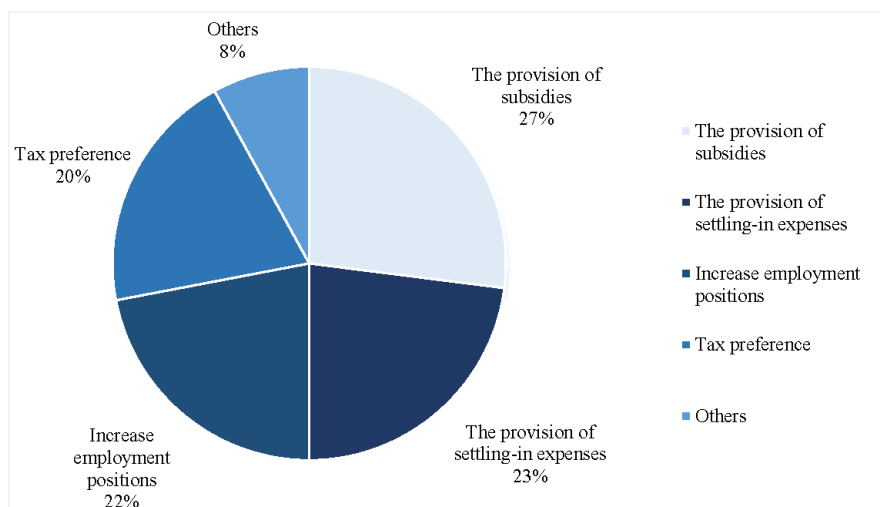


Fig. 7. Desired external support for returning home for employment

According to Fig. 7, desired external support for returning home for employment, among the external support that college students want to get when they go back to their hometowns for employment, the provision of subsidies accounts for 27%, and the provision of settling-in expenses accounts for 23%, both of which account for a large proportion. Based on the survey results, we can draw relevant conclusions and make suggestions for the government's improvement.

4.3 Chi-Square Test and Regression Analysis

To explore the relationship between the willingness to return to their hometown and the degree of satisfaction of college students with their hometowns, we categorize the degree of satisfaction with the development of hometowns into four grades: dissatisfied, average, satisfied, and very satisfied. We carry out the chi-square test of the cross-tabulation table, as shown in Table 4.

Table 4. Cross-tabulation table of satisfaction with hometown and returning to hometown for employment

Category	Number of persons/name		Percentage/%	
	Dissatisfied	Satisfied	Dissatisfied	Satisfied
Dissatisfied	46	22	67.6%	32.4%
Average	94	81	53.7%	46.3%
Satisfied	16	23	41.0%	59.0%
Very satisfied	2	3	40.0%	60.0%

According to the above cross-tabulation table, regarding the degree of satisfaction with their hometowns, only 32.4% of university students are willing to return for employment with dissatisfaction to their hometowns. In the general attitude, 46.3% of college students are willing to go back to their hometown for employment. Among those who are satisfied with their hometowns, 59.0% are willing to return to their hometowns. Among those who are very satisfied with their hometowns, 60.0% are willing to return to their hometowns. Through comparison, it can be found that the more satisfied college students are with the development of their hometown, the greater their willingness to return to their hometown for employment.

Table 5. Hometown satisfaction and returning to hometown for employment Chi-Square test

	Numerical	Df	Asymptotic significance (2-end)
Pearson's chi-square	8.045	3	0.045
Approximation Ratio	8.152	3	0.043
Number of valid observations	287		

We set the original hypothesis that there is no significant difference in satisfaction with hometown and the alternative hypothesis that there is a significant difference. The results are shown in Table 5. The above table shows that the p-value is 0.045, which is less than 0.05. Then, the original hypothesis is rejected, and the alternative hypothesis is accepted. That is, there is a significant correlation between whether college students return to their hometowns for employment or not and their satisfaction with their hometowns' development.

4.4 Logistic Regression Analysis

Logistic regression is commonly used as a method of multivariate regression analysis between the dependent variable, y , which is bicategorical, and the influencing factors (independent variables). The dependent variable in logistic regression is categorical, and the independent variables can be either categorical or continuous. The basic principle of logistic regression is to compute the probability of the attribute in a binomial attribute (0 or 1) concerning the associated independent variables. It is a linear relationship, i.e., Equation (10).

$$P(y=1) = f(x) \quad (10)$$

However, the left side of the equation above has probability p values from 0 to 1, while the right side of the equation has a linear combination of the independent variables that cannot be controlled to be within the 0-1 interval, so we perform a logit transformation, i.e., Equation (11).

$$\text{Logit}(p) = \ln\left(\frac{p}{1-p}\right) \tag{11}$$

Simplified logistic regression model is shown as Equation (12).

$$P = \frac{\exp(\alpha + \beta_1x_1 + \beta_2x_2 + \dots + \beta_nx_n)}{1 + \exp(\alpha + \beta_1x_1 + \beta_2x_2 + \dots + \beta_nx_n)} \tag{12}$$

Logistic regression will be used to transform the willingness to return home for employment into the dependent variable (0 for unwillingness and 1 for willingness). The independent variables will be coded similarly. The incoming independent variables are all categorical, so we set them as dummy variables. Backward stepwise regression was used to screen for influences. The model variable setting is shown in Table 6.

Table 6. Model variable setting table

Variable name	Assignment
Willingness to return to home village for employment	“unwilling”=0, “willing”=1
Gender factor	“man”=1, “woman”=2
Educational attainment factor	“specialized” = 1, ‘undergraduate’ = 2
Whether being an only child	“yes”=1, “no”=2
Whether to participate in practical activities	“yes”=1, “no”=2
Whether parents support	“Supported” = 1, ‘Not supported’ = 2
Place of birth	“Rural” = 1, ‘small towns’ = 2, ‘small and medium-sized cities’ = 3, ‘large cities’ = 3
Economic status of the place where you live	“Poor” = 1, ‘average’ = 2, ‘rich’ = 3
Satisfaction with hometown	“dissatisfied”=1, “average”=2, “satisfied”=3, “very satisfied”=4

Next, the Hosmer and Lemeshow test tested the equation for goodness of fit. The results are displayed in Table 7.

Table 7. Hosmer and Lemeshow test

Step	Chi-square	df	Sig.
5	1.831	5	.872

As can be seen from the above table, the p-value is 0.872, which is not less than the test level of 0.05; therefore, we believe that the information extraction of the current data has been sufficient, and the model has a high goodness-of-fit, so we can proceed to the next step of the analysis.

The above variables were coded, and dummy variables were set to take the first value as the reference level. We selected all the above variables, used the backward likelihood ratio test, set conditions for their screening, and finally selected the following three independent variables. The variables in the equation are presented in Table 8.

Table 8. Variables in equation

	B	S.E.	Wald	EXP (B)
Whether your family agrees or not	-.677	0.358	3.567	.508
Whether you have participated in practical activities such as going to the countryside	-2.015	0.329	37.417	.133
Satisfaction with hometown	-	-	5.599	-
Satisfaction with hometown (1)	.598	.328	3.323	1.818
Satisfaction level with hometown (2)	.997	.456	4.782	2.711
Satisfaction level with hometown (3)	0.982	1.041	.890	2.670
Constant	.380	.415	.838	1.462
Correct prediction rate		71.6%		

5 Conclusion

College students' willingness to return home for employment is low. The survey shows that most students are more inclined to choose first-tier cities or provincial capitals and other developed areas for employment, mainly because of the imperfect infrastructure in their hometowns, insufficient understanding of the policy of returning to their hometowns for employment, and confusion about future career planning. Only a few students would consider returning to their hometowns for employment.

College students prefer stable jobs. In the analysis of work unit tendency, college students prefer higher-stability jobs such as institutions and state-owned enterprises. They are less willing to start a business or work in foreign enterprises, reflecting that they are more conservative in their employment choices.

There are many influencing factors of college students' employment in their hometowns. Through logistic regression analysis, it is found that the main factors affecting college students' willingness to return to their hometowns for employment include satisfaction with the development of their hometowns, the degree of support from their families, and whether or not they actively participate in practical activities such as the "three trips to the countryside." Students who have good infrastructure in their hometowns, are satisfied with their hometowns' development, have their families' support, and have participated in practical activities are more inclined to return to their hometowns for employment.

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