The Influencing Factors on College Students' Career Choices in the Post-epidemic Era: Evidence from China

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Abstract. This paper studies the influencing factors on the degree of change in college students' career choices in the post-epidemic era by constructing a multiple regression model. We find that most colleges have changed their career choices; the factors of the epidemic, government decisions, college behaviours, personal differences, and families are critical in affecting changes in colleges' career choices. We also establish a conditional logit model to analyse college students' occupational preferences and the key factors of employment in the post-epidemic era, and the following conclusions are obtained: colleges tend to choose stable jobs such as continuing study to obtain a master's degree or applying for public-sector jobs; colleges also tend to choose careers that are less affected by the COVID-19 pandemic.

Keywords: Post-epidemic era · Career choice · Occupational preference · Influencing factors

1 Introduction

According to data from the China Business Industry Research Institute, the number of graduates from 2011 to 2020 has grown at a year-on-year rate of 2% to 5%. The increasing employment pressure, coupled with the COVID-19 pandemic and the economic decline, have caused a large impact on the employment of colleges, making it increasingly difficult for colleges to find jobs [9]. The sudden outbreak of COVID-19 has caused a great impact on the social economy as well as employment, especially making the employment situation of college students more complicated. Meanwhile, with the increasingly severe employment situation, the psychological pressure on college students becomes greater, and some students lose their previous combatant spirit and become afraid to compete with others.

However, the promotion of employment for colleges is conducive to the stability of society, the normal operation and development of the economy, and the further replenishment of high-quality human resources, and is also of great significance to the building of an innovative country. Therefore, we decide to study the influencing factors on college

students' career choices in the post-epidemic era, trying to adapt to the change in college students' career choices and improve the employment situation in China.

Some domestic scholars have already conducted studies on the factors influencing the employment of university students. Liu et al. (2021) [8] believe that personal factors, family factors, and school factors all have an impact on college students' employment intentions. Feng (2020) [3] shows that individual factors, college factors, family factors, and economic factors can influence colleges' career choices; Guo (2019) [4] divides the factors influencing the employment of college students into two aspects: subjective factors and objective factors, where subjective factors include college students' psychological concepts, professional skills, work experience, career planning and courage and ability to participate in entrepreneurship, and objective influencing factors include social system, education system, and social environment. Liu (2019) [7] believes that there are four factors that affect the employment of graduates: gender, internship and student work experience during school, career guidance at school, and the mentality and quality of self.

From the above analysis, it can be found that most of the existing studies ignore the influence of the COVID-19 pandemic, while there are also few studies that focus on the changes in students' career choices and the preference of university students' career choices. Therefore, based on these theoretical backgrounds, we decide to add COVID-19-related factors, combined with the realistic basis, and summarized five factors based on the existing research basis: COVID-19-related factors, personal differences, colleges' behaviours, family factors, and government decisions.

Thus, this study intends to investigate the following two perspectives: Firstly, we pay attention to that whether the career choices of college students have changed under the risky impact of the COVID-19 pandemic and which factors affect their changes. Secondly, we focus on what types of jobs students prefer in the post-epidemic era.

2 Research Design

2.1 Research Hypothesis

2.1.1 The Influencing Factors on College Students' Change in Colleges' Career Choices in the Post-epidemic Era

Existing research shows that COVID-19 has already had a major impact on the personal psychology and perceptions of college students. Huang et al. (2022) [5] show that the experience of isolation during the epidemic and living at home to study has had a negative effect on the psychology of college students. The anxiety, mental stress, and pessimistic economic expectations of college students under the epidemic have seriously damaged the psychological health of college students, and individual risk appetite may also change. Li (2020) [6] believes that the blocking of recruitment interviews, the decline in job implementation rate, and the increase of employment pressure caused by COVID-19 made the future economic expectations of college students pessimistic. Therefore,

graduates actively adjust their employment choices and lower their employment expectations. At the same time, the employment guidance and assistance work of colleges has effectively relieved the employment pressure on graduates. Fang et al. (2022) [1] show that under the epidemic situation, college students' personal employment confidence will decrease, which will increase their employment anxiety. It is also found that effective psychological counselling in colleges, understanding of government employment policies, and less economic pressure can alleviate employment anxiety. Feng et al. (2022) [2] show that under the epidemic, college students have passive employment psychology and become more conservative in career choices. Therefore, this study will examine the extent to which colleges' career choices have changed in the post-epidemic era, and examine factors that may have an impact on colleges' career choices.

The following hypotheses are proposed in this study.

H1:   COVID-19-related factors cause changes in the career choices of college students in the post-epidemic era.

H2:   Personal differences cause changes in the career choices of college students in the post-epidemic era.

H3:   Colleges' behaviours cause changes in the career choices of college students in the post-epidemic era.

H4:   Family factors cause changes in the career choices of college students in the post-epidemic era.

H5:   The government's decision causes changes in the career choices of college students in the post-epidemic era.

2.1.2   Career Preferences and the Influencing Factors on Colleges' Career Preferences in the Post-epidemic Era

The uncertainty of risk brought about by the COVID-19 pandemic may lead to a reversal of the transition phase from "change" to "stability" in college career values. Before the outbreak of COVID-19, colleges gradually adapted to the existence of risk, their entrepreneurial consciousness gradually awakened, and their ritual orientation and self-worth realization values became more obvious. However, after the outbreak of COVID-19, a large number of risk and uncertainty factors led colleges to slow down their pursuit of fame and fortune and become more conservative in their career choices. According to this "stability" shift in colleges' career choices, this study examines the preferences of colleges' career choices and the key factors of their career in the post-epidemic era.

The following hypotheses are proposed in this study.

H6:   Colleges tend to choose jobs with more stability in the post-epidemic era.

H7:   Colleges tend to choose industries that are less affected by the epidemic n the post-epidemic era.

2.2   Data Collection and Validation

2.2.1   Optimal Sample Size Calculation

The proportion of college students who changed their career choice in the post-epidemic era was estimated in the pre-survey. Based on the estimated overall proportion, the optimal sample size is calculated as follows:

$$n = \frac{Z_{\alpha/2}^2 p(1-p)}{E^2} \tag{1}$$

Taking the Z at a confidence level of 95%, $Z_{0.025} = 1.96$, p is the sample proportion, E is the absolute permissible error. $E = 0.05$, and $p = 63.64\%$ according to the pre-findings. The optimal sample size can be approximated. By calculating 354 as the optimal sample size based on the sample size when estimating the simple random sampling proportion p, at a 95% confidence level based on the requirement that the absolute sampling error does not exceed 5%.

2.2.2   Data Sources and Processing

The epidemic was at its peak in Beijing and Shanghai during the research period. In order to make the data more referential and representative, and to reflect the impact of the epidemic on the career choices of colleges, this study mainly focused on college students in Beijing and Shanghai. We distributed more than 500 questionnaires and collected 360 samples.

To make the sample more reasonable, samples with more than 70% of the same number in the data are eliminated, and the valid sample was 356 after eliminating invalid samples. The valid samples are also tested and the reliability and validity of the data are good and suitable for further analysis.

3   Empirical Analysis

3.1   The Influencing Factors on College Students' Change in Colleges' Career Choices in the Post-epidemic Era

3.1.1   Empirical Models

This study uses a multiple linear regression model to study which factors can affect the degree of changes in career choices of colleges in the post-epidemic era. Firstly, based on previous research, we have established a system of influencing factors for the degree of changes in career choices of colleges, including COVID-19-related factors, personal differences, colleges' behaviours, family factors, and government decisions.

There are a number of secondary influencing factors for each (see the appendix for the specific variable definitions). These secondary influencing factors become the independent variables of the multiple regression. The dependent variable of the regression is the degree of change in the colleges' career choices.

The multiple regression model can be expressed as:

$$y = a + b_1 X_{1,n} + b_2 X_{2,n} + b_3 X_{3,n}$$
$$+ b_4 X_{4,n} + b_5 X_{5,n} + \varepsilon \qquad (2)$$

Among them, y represents the degree of change in the colleges' career choices, $X_{1,n}$, $X_{2,n}$, $X_{3,n}$, $X_{4,n}$ and $X_{5,n}$ represents COVID-19-related factors, personal differences, colleges' behaviours, family factors, and the government decisions. a is the constant of the regression. ε is the residual of the regression.

3.1.2 Descriptive Statistics

There are 356 valid samples in total, and a score of 1 to 2 in the "degree of change in career choice direction" means that their career choices have hardly changed. In our sample, 23.31% of colleges have little change in their career choices, while 76.69% of the colleges' career choice has undergone major or minor changes. Among them, the major changes and above (with a score of 5 and above) account for a large number of samples. The sample description statistics show that under the influence of the epidemic, the vast majority of colleges have changed their career choices.

For the five influencing factors of career choice, the COVID-19-related factors have achieved the highest score according to the mean and median. The mean and median scores of government decisions, colleges' behaviour, personal differences, and family factors are all below 4, slightly less than the median level.

Overall, the self-evaluation, emotions, family employment environment, external college support, and government policy support of colleges under the epidemic are not at a high level, which makes colleges in the post-epidemic era unfavourable career conditions. Maybe this is the reason why 76.69% of the respondents have changed their career choices.

3.1.3 Empirical Results

The regression results and statistical test results are shown in Table 1. The F value is 22.55, which indicates a strong explanatory power. The linear significance of the model, the p value of the F test, is 0.0000 and less than 0.05, indicating that the model is significant.

The coefficients of *Anxiety*, *Government_Support*, and *Experience* are 0.082, 0.166, and 0.230, respectively, at the 5% level. This means that one point increase in *Anxiety, Government_Support*, or *Experience* can lead to 0.082, 0.166, or 0.230 increments in the degree of changes in career choices. Furthermore, the coefficient of *Attention* is significant and positive, 0.315, at the 1% level, which means that an increase in *Attention* also causes an increase in the degree of *change*. While the coefficients of *Policy_Advocacy* and *Ability* are −0.178 and −0.218, respectively, at the 1% level, which means that career policy dissemination on campus and excellent personal ability can inhibit the increase

Table 1. Total regression results based on all samples[Owner-draw].

		Degree of change
COVID-19 related factors	Attention	0.315***
		(6.08)
	Anxiety	0.082**
		(1.99)
Government's decisions	Government_Support	0.166**
		(2.16)
Colleges' behaviors	Policy_Advocacy	−0.178***
		(−3.24)
Personal differences	Optimism	−0.107**
		(−2.42)
	Ability	−0.218***
		(−4.59)
	Experience	0.230**
		(2.55)
Family factors	Family_Economy	−0.112**
		(−2.37)

Notes: * P < 0.10, ** P < 0.05, *** P < 0.01

in the degree of *change*. Finally, the coefficients of *Optimism* and *Family_Economy* are significant and negative, −0.107 and −0,112, at the 5% level, respectively. The more optimistic college students are or the better their family's economic situation is, the less easy they are to change their career choices. In conclusion, the empirical results are consistent with H1 to H5.

According to the regression results, the regression equation is established as follows:

$$\hat{Y} = 4.658 + 0.315\,Attention$$
$$+ 0.082\,Anxiety$$
$$+ 0.166\,Government\_Support$$
$$- 0.178\,Policy\_Advocacy$$
$$- 0.107\,Optimism - 0.218 Ability$$
$$+ 0.230\,Experience$$
$$- 0.112\,Family\_Economy \tag{3}$$

3.2 Career Preferences and the Influencing Factors on Colleges' Career Preferences in the Post-epidemic Era

3.2.1 Empirical Models

This paper adopts the conditional logit model to construct a model of colleges' career preference and its influencing factors in the post-epidemic era, judging the probability of occupational selection in the model from the perspective of occupational nature. Suppose that the employed person faces a series of alternative jobs before making a career choice, and which job to choose depends on the utility of the characteristics of the occupation to the employed person, which can be expressed as:

$$U_{ij} = F(Y_{ij}), i = (1, 2, 3, \ldots, N),$$
$$j = (1, 2, 3, \ldots, J) \tag{4}$$

Among them, U_{ij} represents individual utility, $F(g)$ represents the specific form of the utility function. Y_{ij} represents characteristics of occupation. i represents the number of individuals. j represents several career options. When an individual chooses a job j instead of a job k, it means that $U_{ij} > U_{ik}$; $\forall j \neq k$, the probability of choosing a career j is:

$$P(chosen_{ij} = 1) = \frac{\exp[F(Y_{ij})]}{\sum\limits_{j=1}^{J} \exp[F(Y_{ij})]} \tag{5}$$

Among them, the dependent variable $chosen_{ij}$ is a dummy variable about occupational choice, which takes 1 when the occupation is selected, and 0 otherwise.

Since each individual faces j choices when making a career choice, the actual sample size is the product of the number of individuals and the number of available careers, which is $N \times j$.

3.2.2 Descriptive Statistics

Among the 356 samples recovered, the majority of the select postgraduate study and public-sector jobs. 44.94% of the respondents chose to postgraduate study after graduation, and 21.07% of the respondents chose public-sector jobs. Secondly, freelancers accounted for 9.27%, and the samples of studying abroad, careers in ordinary state-owned enterprises, careers in ordinary foreign enterprises, and private enterprises all accounted for about 6%, while national policy-based careers accounted for only 1.40%. It can be seen initially that in the post-epidemic era, most colleges tend to choose jobs with high stability, such as continuing study after graduation and public-sector jobs.

According to the above proportions, the pie chart is drawn. Postgraduate study, public-sector jobs, and freelance occupations account for 75.28% of the three occupational choices, while other occupational choices only account for about 25%. In order to make the model more reasonable and accurate, this paper only selects occupations with a large sample size for regression, which are postgraduate study, public-sector jobs, and freelance jobs (Fig. 1).
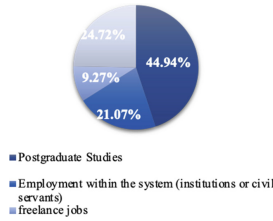
Fig. 1. Career Choice Distribution[Owner-draw].

Table 2. Descriptive Statistics for Empirical Analysis II[Owner-draw].

Variables	SD	Max	Median	Mean	Min
COVID-19	1.52	7.00	4.00	3.99	1.00
stability	1.47	7.00	4.00	4.42	1.00
free	1.32	7.00	4.00	4.14	1.00
support	1.55	7.00	5.00	4.81	1.00

Notes: * P < 0.10, ** P < 0.05, *** P < 0.01

From Table 2, it can be initially found that if the degree of family support and job stability is higher, the colleges are more inclined to choose this direction as their careers. If a career is less affected by COVID-19, colleges tend to choose such jobs. To sum up, it shows that in the post-epidemic era, the career tendency of colleges has gradually shifted to a direction that is highly stable and less affected by the epidemic. (See the appendix for specific variable definitions.)

3.2.3 Empirical Results

As can be seen from Table 3, the LR chi-square value is 437.57, which has strong explanatory power. The overall p-value of the model is 0.0000 and is less than 0.05, indicating that the model is valid.

The coefficient of *postgraduate* is greater than 1, indicating that the *postgraduate* and *choice* are positively correlated at the 1% significance level. The coefficient of *civil_ser* is greater than 1, indicating that the *civil_ser* and *choice* are positively correlated at the 1% significance level. The coefficient of *freelance* is less than 1, indicating that *freelance* and *choice* are negatively correlated at the 1% significance level. The above results show that in the post-epidemic era, colleges are most likely to choose postgraduate study, followed by public-sector jobs, and are not inclined to choose freelance jobs, which is consistent with H6 expectations.

In addition, *COVID-19* is negatively correlated with *choice* at the 1% level, indicating that the less an occupation is affected by the epidemic, the greater the probability of the occupation being selected, which is consistent with H7.

Table 3. Regression Results for Empirical Analysis II[Owner-draw].

	choice
postgraduate	1.968***
	(13.84)
civil_ser	1.050***
	(5.68)
freelance	0.589***
	(2.81)
COVID-19	0.456**
	(2.43)
stability	14.753
	(0.02)
free	−0.005
	(−0.03)
support	17.931
	(0.02)

Notes: * P < 0.10, ** P < 0.05, *** P < 0.01. This table is the result of the logit conditional test, so we only refer to the significance and the correlation, not the coefficient

4 Conclusions

Based on the background of the epidemic, this paper studies the influencing factors of colleges' career choice changes and colleges' career preferences and their influencing factors. A total of more than 500 questionnaires were distributed, and 360 questionnaires were recovered. After excluding invalid questionnaires, there were 356 valid questionnaires. After a series of data inspection and analysis, this study draws the following conclusions:

First, in the post-epidemic era, the vast majority of colleges have changed their career choices. In this regard, national policy measures, college education, and students should actively respond to these changes, so as to alleviate the severe employment situation of college students under the epidemic.

Second, COVID-19-related factors, personal differences, college behaviors, family factors, and government decisions are all important factors that affect the changes in college students' career choices, of which the epidemic and personal factors are the most important. Only by insisting on fighting the COVID-19 together can we overcome it as soon as possible. And most importantly, the degree of optimism, professional ability, and practical experience of colleges themselves about the epidemic have a significant impact on their career choices. Therefore, students themselves should adjust their mentality, adapt to the employment situation in the post-epidemic era, and enhance their ability to withstand pressure and adaptability. In addition, the government's policy encouragement and employment education in colleges can also help students.

Finally, affected by the uncertainty of the epidemic, college students tend to choose stable jobs such as postgraduate study and public-sector jobs and are not inclined to choose freelance jobs. In terms of industry choices, college students tend to choose industries that are less affected by the epidemic. For this, on the one hand, it is necessary for the government to strengthen macro-control and establish a policy system for the employment of colleges in colleges and universities to adapt to changes in the epidemic. At the same time, according to the preference of colleges for stable occupations such as units within the public system, the government should further narrow the gap between units within the system and private enterprises, start-up companies, etc., and provide colleges with a variety of employment options. In this special era, the government can put an end to the excessive pursuit of "iron rice bowls", and encourage colleges to innovate and start businesses, so they can find value coordinates that are more suitable for them and establish the career values of Chinese colleges of "going to the grassroots, understanding the truth, and understanding people's livelihood" which can reduce convergence, repetitive competition, and internal friction. On the other hand, colleges should take measures from both policy advocacy and policy formulation, including opening college career planning courses, providing a certain employment platform, broadening career channels for colleges, and providing them with more employment opportunities and employment information that can ease their employment pressure. At the same time, Colleges and universities should pay attention to the employment psychology of colleges, encourage colleges to correct their mentality, reject anxiety, strive to improve their self-cultivation, professional knowledge, and technical ability, and actively adapt to changes in the employment situation based on their own advantages, and establish a multidimensional sense of competition and multidimensional self-realization spirit.

Authors' Contributions

Huan Zhang: Conceptualization, Methodology. **Yue Zhang:** Data curation, Writing - review & editing. **Shuaihao Wu:** Investigation, Writing - original draft.

Appendix

See Tables 4 and 5.

Table 4. Variable definition of empirical evidence I[Owner-draw].

empirical evidence I		
Variables	Symbols	Questionnaire presentation
Dependent variables		
Degree of change in direction of career choice	Choice_Change	Has your career choice changed since the outbreak?
Epidemic factors		
Outbreak risk level	Risk	What is the risk level of the epidemic in your area?
Total number of days in quarantine	Isolation	What is the cumulative number of days you have been under compulsory home quarantine?
Perception of the role of quarantine	Opinion_Isolation	How effective do you think isolation has been in controlling the outbreak?
Level of knowledge of the epidemic	Understanding	How well do you know about the Newcastle Pneumonia outbreak?
Level of concern about the epidemic	Attention	How concerned are you with information about the outbreak?
Level of anxiety under the epidemic	Anxiety	Are you more anxious and irritable than before during the outbreak?
Concern about infection	Worry	Are you worried that you or your family members are vulnerable to infection?
Health status	Health	Are you in good health during the epidemic?
Personal factors		
Optimism about the outbreak	Optimism	Are you optimistic about the future development of the epidemic?
Work expectations	Job_Expectations	I have high expectations for my future work
Clarity of purpose	Goal	I have a clear self-concept and understand my characteristics and goals
Spirit of adventure	Adventurous	I like to take risks
Personal values achieved	Personal_Value	I want to achieve personal value in my work

Table 4. (*continued*)

empirical evidence I		
Social values	Social_Value	I want to work and contribute to society at the same time
Professional competence	Ability	I have a strong professional knowledge to facilitate my employment
Practical experience	Experience	I have extensive practical experience in internships
Interpersonal skills	Communication	I have strong interpersonal skills in the workplace
University behavior		
Psychological Care in Higher Education	College_Care	How psychologically relevant is your university to you during the epidemic?
Employment Opportunities Provision	Opportunity	How well does your university provide you with employment opportunities in the event of an epidemic?
Employment policy dissemination	Policy_Advocacy	How well does your university communicate its career policy in the event of an epidemic?
Career planning education efforts	Education	How well does your university educate students on career planning in the event of an epidemic?
Career guidance satisfaction	Guidance	How satisfied are you with your school's career guidance during the epidemic?
Family factors		
Family financial situation	Family_Economy	My family is in a good financial situation
Employment climate	Family_Atmosphere	My family is positive and has a good employment climate
Family support	Family_Support	My family is supportive of my employment
Advice supply	Suggestion	My family is able to advise me on my employment

Table 4. (*continued*)

empirical evidence I		
Consistency of views on employment	Opinion_Consistency	My personal outlook on employment is in line with my family's views
Government Decision Making		
Government Support	Government_Support	How much support do you expect the government of your future employment area to provide for college employment in the event of an epidemic?
Level of policy awareness	Policy_Understanding	Are you aware of the relevant government policies to support college employment under the epidemic?
Local employment situation	Employment_Situation	Do you think the current employment situation is optimistic?

Table 5. Variable definition of empirical evidence II[Owner-draw].

Empirical evidence II		
Variables	Symbols	Questionnaire presentation
Dependent variables		
Career choices	Choice	Generate the variable, 1 if the respondent chooses that career direction, 0 otherwise
Career Choice		
Master study	postgraduate	Which direction would you prefer to move in the context of the current epidemic?
Study abroad	abroad	
Employment in the system (career or civil service)	civil_ser	
Research-oriented employment (scientific research institutions)	research	
National policy type employment (western program, selected students, etc.)	Policy_employ	

Table 5. (*continued*)

Empirical evidence II		
Employment in general state-owned enterprises	soe	
General foreign enterprise, private enterprise employment	Foreign_firm	
Freelance employment	freelance	
Others	other	
Key factors for employment		
Industry affected by the outbreak	COVID-19	Is your chosen development direction vulnerable to epidemic disruptions?
Stability	stability	How stable is the development of the development direction you have chosen?
Degree of freedom	free	What is the degree of freedom in your chosen direction of development?
Family support	support	Does your family support your chosen direction of development?

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