United College, The Chinese University of Hong Kong General Education Course

GEUC 4011 Senior Seminar

1st Term, 2021-2022

Final Report

Employment Preference for Chinese College Students During the Pandemic

Written by

LU Xintong

WANG Wenya

CHENG Jianlong

ZHANG Haoxiang

Content

1. Abstract

With the spread of the coronavirus, the employment situation for college graduates has turned to the downside in China. The government-measured policies such as quarantine and lockdown have deepened the effect of unemployment for fresh graduates, especially in mainland China. Therefore, this research is interested in the employment preference of Chinese college students under the impact of COVID-19.

We hypothesized that the preference of college students will become more conservative under COVID-19 and will be moderated by demographic factors including gender, year level, and family income. The result turned out that the employment preference of college students did turn more conservative in the sense that their emphasis on the stability of work has increased. Moreover, family income act as a moderator in the predictive relationship between the "understanding of redundancy conditions" and the "difference of expected work stability before and after COVID-19".

2. Background and Introduction

COVID-19, a contagious disease that can cause the acute respiratory syndrome, first exploded in December 2019. However, with more than two years passing, the impacts that COVID-19 brought to China are not limited to health or physiological issues anymore. Rather, deep influences on the societal level have occurred with the further spread of coronavirus, one of which is a significant employment issue, especially for college students.

Several trends appeared during the further explosion of COVID-19. First, the reduction of jobs turned out to be one of the most salient trends after reviewing the statistics. According to the "2020 Freshmen Spring Recruitment Trend Report" released by Boss Direct Employment on March 31, 2020, the recruitment demand of various enterprises for fresh graduates from colleges has dropped by 22% on a yearly basis (Huang, 2021). Second, there has been an increasing number of graduates in China according to statistics. The number of college students reached 8.21 million, 8.34 million, and 8.74 million respectively from 2018 to 2020. In 2021, this number exceeded 9 million for the first time (Liu, 2021). And in 2022, it reached 10.76 million (Mao et al., 2022). Combining the decreasing of jobs and rising scale of graduates, an oversupply in the talent market has been caused.

Moreover, since the government issued policies preventing the circulation of COVID-19, the Ministry of Education has made it clear that onsite recruitment will be temporarily suspended, causing significant changes in the recruitment form (Huang, 2021). With no previous experience in online recruitment, many enterprises must adapt their recruitment system in order to increase the accuracy and efficiency of recruitment. At the same time, college graduates should pay close attention to employment news and prepare for new forms of job-hunting. Therefore, the change in recruitment form caused trouble for both enterprises and college graduates in China. Due to similar reasons, college students' plans for graduation were significantly interrupted by COVID-19, such as plans for the internship, entry examinations, and laboratory work, leading to a delay in the graduation process (Huang, 2021).

Last but not least, owing to the fact that the employment situation is grim, and few resources are approachable, college students typically suffer from prolonged psychological anxiety which awaits to be solved (Aucejo et al., 2020).

3. Literature Review & Research Gaps

3.1. Literature Review

Under the enormous employment pressure, data has shown that the employment situation for college students is not quite promising. Until the second half of March 2020, only 26.9% of fresh graduates in China claimed to have landed a job, revealing the huge impact brought by the epidemic (李, 2020). Moreover, compared with the relatively high job placement rate (46.9%) of those who graduated from "985" universities, the rate (17.7%) was much lower for those who graduated from normal undergraduate universities (李, 2020). Similar to China, research conducted in Bangladesh found that the rate of unemployment increased from 47% to 58% from 2019 to 2020 for fresh graduates (Shahriar, 2021).

Except for the fact that employability decreased for college graduates during the epidemic, research also suggests that the impacts imposed by COVID-19 can be differed by demographic factors such as ethnicity, gender, educational level, etc. A study conducted in the United States showed that risk factors for higher vulnerability to unemployment under COVID-19 include females, aged between 20 and 29, black, and having no college degree (Moen et al., 2020). Research in China also indicated that women graduates are in a less optimistic situation regarding unemployment compared to men, mainly for the fact that the epidemic has exerted a huge strike on the manufacturing and services industry. Moreover, it also suggested that science and art

graduates are less positive about the employment situation than their counterparts in literature and history (宋&张, 2021).

Moreover, several shifts have been identified in regard to college students' preferences when choosing a job. First, a shift in industry preference occurred to new energy, public administration, and community-level employment (Liu, 2021). Referring to the survey conducted by BOSS Zhipin, 45% of graduates are willing to try grassroots and community positions. Another finding is that 4 months after the explosion of COVID-19, the proportion of graduates who chose state-owned units dropped by 6 percent, while that of graduates preferring state-owned enterprises increased by 4 percent (李, 2020). Meanwhile, the percentage of private sector enterprises rose by 6 percent, and the percentage of foreign-owned enterprises decreased by 6 percent instead (李, 2020). These statistics can be informative in way that it reveals the fact that graduates tend to choose more stable jobs but are not totally giving up the willingness to take up challenges.

The second shift occurred in graduates' choices of studying abroad. A study using a sample of both Mainland China and Hong Kong graduates suggests that 84% showed no interest to study abroad after the pandemic. Even if some graduates have the intention to study further abroad, their choices are concentrated in Asian cities such as Japan, Taiwan, and Hong Kong, apart from the US and the UK (Mok et al., 2021). Third, the change in the choice of employment location of recent graduates also reflects a risk aversion tendency. Their preference shifted from first-tier cities like Beijing, Shanghai, Guangzhou, and Shenzhen to third-or-fourth-tier cities and counties (李, 2020). Last but not least, it was also observed that the willingness of graduates declined by 4 percent from November 2019 to March 2020 (李, 2020).

3.2. Research Gaps

Although there has been research around the globe regarding the unemployment situation of fresh graduates during the pandemic, research in the context of China tends to be quite similar and limited. Abundant evidence lies in the relevant government policies, while less focus has been placed on the preference of college students. Moreover, statistical significance in preference shifts has not been tested in any research in China yet, along with the reason behind these shifts.

Furthermore, the demographic factors that can moderate the relationships between COVID-19 and employment preference lack solid research evidence in China. In the Chinese context, the policies toward COVID-19 such as quarantine and lockdown keep

ongoing despite the other countries' practices in herd immunization. Therefore, some Chinese unemployment issues under the rather prolonged COVID-19 condition can be context-specific.

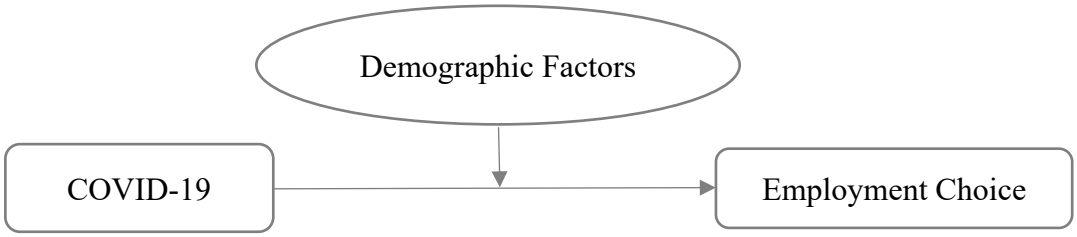
4. Hypothesis

Hypothesis 1: After the explosion of COVID-19, students' employment choice has become more conservative.

Null Hypothesis (H_0)
Students' employment choices do not have significant differences before and after the explosion of COVID-19

Alternative Hypothesis (H_1)
Students' employment choices do have significant differences before and after the explosion of COVID-19

Hypothesis 2: The extent to which COVID-19 can influence students' employment choice differs by college students' gender, year level, and family income (demographic factors or moderators).



5. Quantitative Analysis

In the quantitative analysis section, the survey is used as the basic data collection method. The data is interpreted and portrayed by basic statistics summaries and is reorganized by contingency tables or frequency tables. And hypothesis testing and linear regression are used as our quantitative analysis methodology. Hypothesis testing and linear regression analysis are performed in R and the moderation effect is checked through Jamovi.

5.1. Questionnaire Design

Since our targeted population is mainly university students from mainland China, in order to collect more valid data, we design the questionnaire on WJX (问卷星) in simplified Chinese to collect samples. There are a total of 32 questions related to the potential factors that might have some potential influence on our two hypotheses. The questionnaire is divided into two parts. The first part includes 12 independent variables. The second part includes 18 paired dependent variables. We also design 2 questions as validation questions.

5.1.1. The Independent and Dependent Variables

The independent variables include the predictors and the moderators, which are studied under linear regression for hypothesis two. Predictors are the independent variable that is related to Covid-19, such as total quarantine and lockdown time, understanding of redundancy conditions, etc. Considering there might be different results in the different backgrounds of the population, we introduce the moderator into our linear regression model. The moderators are the independent variables that are not related to Covid-19 but may have some potential influence on the results, such as gender, family income, etc.

The dependent variables include the quantitative variables and categorical variables, which are studied under hypothesis testing and linear regression for both hypotheses one and two. Quantitative variables are all from a range of [0, 100], the answer to the question represents the willingness of the particular factors under the question, such as the willingness to work from home, the expected level of work stability, etc. Categorical variables include nominal variables and ordinal variables. Options in categorical variable questions are designed to refer to the global standard or our two hypotheses. Options in ordinal variables represent the non-linear level of the questions, which means the bigger the option is, the higher the level is.

5.1.2. Data Collection

The questionnaire is launched in early Sept. With the privacy terms clarified in the heading, the questionnaire is available before 20th Sept. The data is collected by convenience sampling method under the non-probability sampling technique. The questionnaire is mainly distributed to our own friends in mainland China. And we ask them to redistribute it to their friends. In the end, we collect a total of 160 data. But after we filter by the two validation questions, there are only 80 valid data left for us to perform the quantitative analysis. The following analysis in this section is based on

these 80 valid data ("the sample").

5.2. Sample Portrait

Sample portrait depicts independent variables by charts, tables, percentages, and five-number summaries. Most of our data is not normally distributed and comes from university students from mainland China.

5.2.1. Gender & Hometown

62.5% of them are female, which indicates there is a severe gender imbalance in the sample. The hometown of the sample is spread over China, including 25 provinces. Due to our convenience sampling method, there are 23.75% of the sample from Xinjiang Province, and 15% from Jiangsu Province, which are the hometowns of the investigators, which is shown in Figure 1.

Figure 1: Gender and Hometown

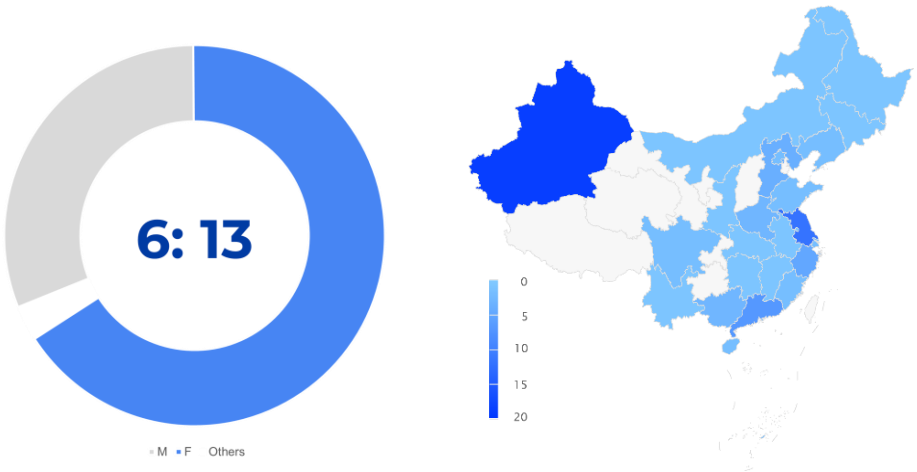


Table 1: Faculty and Year Level

Faculty	Count
Others	5
Medicine	2
Art	4
Science	15
Engineering	15
Social Science	14
Business Management	25

Year Level	Count
Year 1	12
Year 2	12
Year 3	26
Year 4 and Above	30
Total	80

5.2.2. Education

The education level is focused on undergraduates, which is 94.75% of the sample. Few of them have college or master's degrees. The year level is a little bit left skewed. 70% are year three or above students, which means our sample may have some acknowledgment of job market conditions before the pandemic. They may also have a much clearer plan for their future. There is no data from students majoring in Law and Education. 31.52% of the sample are majoring in Business Administration and Management, which is shown in Table 1.

5.2.3. Internships & Understanding of Redundancy Conditions

Around half (46.25%) had one or two internships. 44.68% once worked in the financial industry among them. 21.25% experienced remote internships. For the understanding of redundancy conditions, assume 0 is know nothing and 10 is well acknowledged, most of our sample know little or something about the redundancy conditions during the pandemic. Only 1.25% are familiar with the redundancy conditions, which is shown in Table 2.

Table 2: Understanding of Redundancy Conditions & Internship Experience

Understanding of Redundancy Condition	Count	Percentage	Internship Experience (Times)	Times	Percentage2
Nothing	13	16.25%	0	33	41.25%
A little bit	14	17.50%	1	21	26.25%
Not much	28	35.00%	2	16	20.00%
Know	25	31.25%	3	9	11.25%
Familiar	1	1.25%	>4	1	1.25%

5.2.4. Family Background

Three-quarters of the sample have family income per annum lower than 0.5 million and 13.75% are higher than 1 million, which indicates the family income is highly right-skewed [Table 3]. 31 samples indicate that no family members are working within the system.

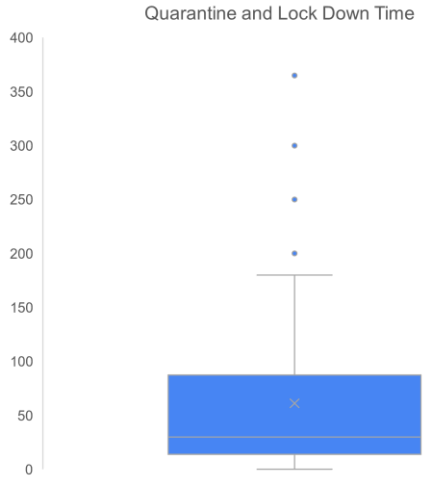
Table 3: Family Income

Family Income	Count	比例
<0.15m	9	11%
0.15m~0.3m	26	33%
0.3~0.5m	25	31%
0.5~1m	9	11%
>1m	11	14%

5.2.5. Quarantine & Lockdown

Over half (51.25%) of the sample experienced both quarantine and lockdown. Only 13.75% of the sample experienced neither quarantine nor lockdown. The total quarantine and lockdown time is highly right-skewed. Half of them only have quarantine or lockdown for less than 1 month. Only 13.75% of the sample have quarantine or lockdown day counts of more than 100 days. The median is 30 days. The average is around 62 days. But the approximate maximum is 365 [Figure 2].

Figure 2: Quarantine and Lockdown Time Box Plot & Summary



Statistics	Day Count
Min	0
1st Qu	14
Median	30
3rd Qu	82.5
Max	365
Mean	61.1

5.3. Hypothesis Testing

For dependent variables, it is important to know whether there is a significant difference for each dependent variable before and after Covid-19. Hypothesis testing can give us a solid conclusion about the shift between the pairs. The different tests will be used under different conditions for each pair. In our research, the general hypothesis testing procedure is conducted as follows.

Null Hypothesis H_0: There is no significant difference between the target variables before and after Covid-19. Or the target variable is independent of Covid-19.
Alternative Hypothesis H_1: There is a significant difference between the target variables before and after Covid-19. Or the target variable is not independent of Covid-19.

The test statistics and p-value are computed based on the conditions of dependent variables by different methods. According to the alternative hypothesis H_1, the two-tailed test is used to calculate the p-value. By convention, the hypothesis testing is conducted under significance level $\alpha < 0.05$.

We will compare the p-value and the significance level for each test and draw a conclusion. If the p-value is smaller than the significance level, we will reject the null hypothesis H_0 and conclude there is a significantly different or is independent of Covid-19. Otherwise, we fail to reject the null hypothesis.

5.3.1. Quantitative Dependent Variables Paired Sample T-Test

There are a total of 5 quantitative dependent variables. The quantitative dependent variables are continuous in the range [0,100] and are paired data for each factor (i.e. before Covid-19 & after Covid-19). Each observation is independent of the others. For each paired quantitative dependent variable, denoted by Y_b, Y_a, (Let $Y_b :=$ the variable before Covid-19, $Y_a :=$ the same variable after Covid-19), assume the mean and variance for them are denoted by $\mu_b, \mu_a, \sigma_b^2, \sigma_a^2$ respectively. Since the data is not normally distributed, performing the parametric test directly is not appropriate.

Since the sample size, denoted by n, is 80 (i.e. $n = 80$), which is greater than 30. Therefore, by Central Limit Theorem, the mean of the paired variables, denoted by $\overline{Y_b}, \overline{Y_a}$, follows the approximately normal distribution with parameters $\left(\mu_b, \frac{\sigma_b^2}{n}\right)$, $\left(\mu_a, \frac{\sigma_a^2}{n}\right)$ respectively (i.e. $\overline{Y_b} \sim N\left(\mu_b, \frac{\sigma_b^2}{n}\right), \overline{Y_a} \sim N\left(\mu_a, \frac{\sigma_a^2}{n}\right)$). Therefore, paired sample t-test can be used.

The test statistics for paired sample t-test is $t = \frac{\overline{Y_b} - \overline{Y_a} - 0}{S_d/\sqrt{n}}$ ($S_d :=$ the difference between pairs for each observation). After performing the test in R, we can reject the null hypothesis H_0 for quantitative dependent variable expected level of work stability with p-value = 0.02554 [Table 4]. And the corresponding conclusion is the expected level of work stability after Covid-19 has a significant difference from the expected level of work stability before Covid-19 under significance level $\alpha = 0.05$. In other words, Covid-19 has changed the expected level of work stability.

Table 4: Quantitative Dependent Variables p-value Summary

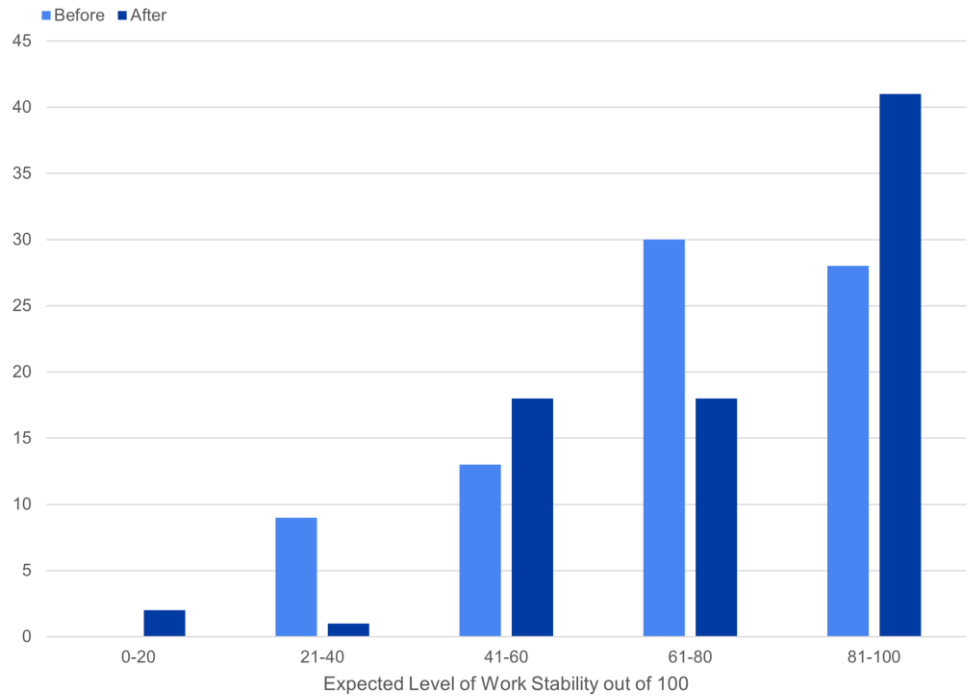
Variable Name	p-value	Conclusion
Willingness to Future Study	0.39170	Fail to Reject
Expected Level of Work Stability	0.02554	Reject
Willingness to Work from Home	0.73200	Fail to Reject
Willingness to Work in the System	0.06705	Fail to Reject
Willingness to Work in the Well-Known Enterprise	0.45280	Fail to Reject

After Covid-19, the expected level of work stability shifts toward two tails, which means people expect to have more extreme stability of work [Table 5]. There are 13 more people who expect to have much more stable working conditions, which means the shift is especially toward the conservative side [Figure 3].

Table 5: Expected Work Stability

Expected Work Stability	Before Covid-19	After Covid-19	Difference
0-20	0	2	2
21-40	9	1	-8
41-60	13	18	5
61-80	30	18	-12
81-100	28	41	13

Figure 3: Expected Work Stability



5.3.2. Categorical Variables Chi-Square Test

There are a total of 4 paired categorical dependent variables. Let us denote each paired categorical dependent variable by Y_b, Y_a, (Let $Y_b :=$ the variable before Covid-19, $Y_a :=$ the same variable after Covid-19). Assume a categorical dependent variable before Covid-19 Y_b can be fitted by a certain model. Whether the same categorical dependent variable after Covid-19 Y_a fit in the same model is what we are concerned about. In other words, whether the occurrence of Covid-19 is independent of the categorical dependent variable. Therefore, the Chi-square test can be used.

In order to perform the Chi-square goodness of fit test, a contingency table of observed value (occurrence count) for each paired categorical dependent variable should be constructed, such as Table 6, before conducting the test into R. Assume the observed count for each option of the paired dependent variable is denoted by O_i for i^{th} observation, the expected count correspondingly is denoted by E_i. The test statistics for the Chi-square test is $\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$.

After performing the test in R, we can reject the null hypothesis H_0 for categorical dependent variable dream working city with p-value $= 2.2 \times 10^{-16}$. And the corresponding conclusion is the dream working city is not independent of Covid-19.

After Covid-19, 6 more people would like to work overseas. 5 people choose to work in other cities instead of Shanghai. More people would like to choose small or lower-tier cities as their dream working cities [Figure 4].

Figure 4: Dream Working Cities (Before & After)

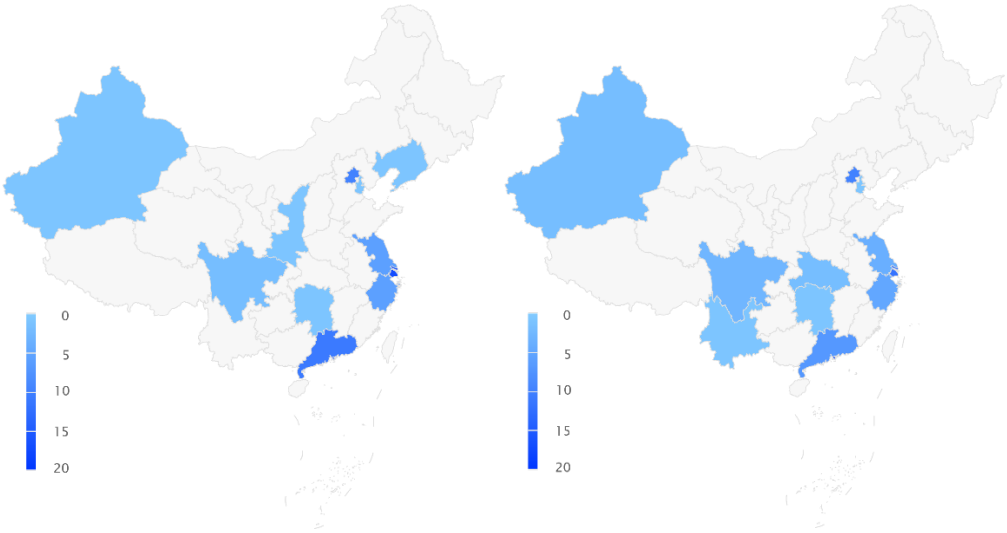


Table 6: Contingency Table for Dream Working Cites

		After														
		M	BJ	GD	O	HB	HN	JS	SH	SC	TJ	HK	XJ	YN	ZJ	Total[1]
Before	M	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	BJ	0	7	0	1	0	0	0	0	0	0	1	0	1	0	10
	GD	0	0	5	3	0	0	0	0	0	0	2	1	0	0	11
	O	0	0	0	6	0	0	0	0	0	0	1	0	0	0	7
	HN	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
	JS	0	1	0	1	0	0	4	0	0	0	0	0	0	0	6
	LN	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	SX	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	SH	0	1	2	1	1	0	0	11	1	0	0	0	0	0	17
	SC	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
	TJ	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
	HK	0	0	0	0	0	0	0	1	0	0	14	0	0	0	15
	XJ	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
	ZJ	0	0	0	1	0	0	0	0	0	0	0	0	0	5	6
	Total	1	10	7	13	2	1	4	12	3	1	18	2	1	5	80

5.4. Linear Regression

After knowing there are significant differences for the expected level of work stability and the dream working city before and after Covid-19. How Covid-19 correlates between the dependent variables and independent variables is what we want to find out. Since the dream working city is a categorical dependent variable, which is difficult to perform linear regression. We will mainly discuss the relationship between the expected level of work stability and the other independent variables.

5.4.1. Variable Clarification

In order to find out how the independent variables affect the change in paired dependent variable expected level of work stability, the difference between the expected level of work stability after Covid-19 and before Covid-19 is the response variable in linear regression, denoted by Y_{reg}.

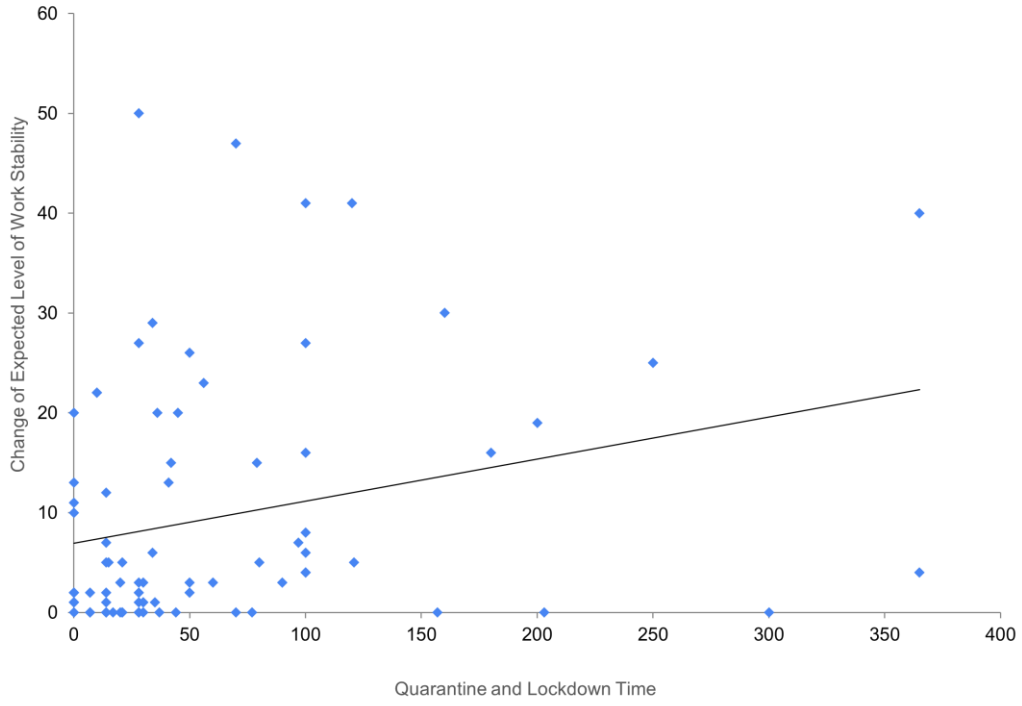
[1] M: Macau; BJ: Beiijing; GD: Guangdong; O: Overseas; HB: Hubei; HN: Hunan; JS: Jiangsu; SH: Shanghai; SC:Sichuan; TJ: Tianjin; HK: Hong Kong; XJ: Xinjiang; YN: Yunnan; ZJ: Zhejiang; LN: Liaoning; SX: Shannxi

Since Covid-19 is the ultimate explanatory variable, let all the predictors (independent variables relate to Covid-19), such as total quarantine and lockdown time, and understanding of redundancy conditions, as our explanatory variables in linear regression, denoted by X_1, X_2 respectively.

5.4.2. Data Transformation

Since the total quarantine and lockdown time X_1 is highly right-skewed, as we mentioned before, the leverage points have a significant effect on the regression model, such as Figure 5. Since the range of X_1 is [0, 365], the range of $X_1 + 1$ is [1, 366], which is always positive. Apparently, most of the value of X_1 are multiples of 7 due to the quarantine policy in mainland China. In order to minimize the effect of the leverage points, we perform $log_7(X_1 + 1)$ for total quarantine and lockdown time transformation. Let $X_3 := log_7 X_1$ instead of X_1 be one of the terms in linear regression.

Figure 5: Regression between Quarantine and Lockdown Time & Change of Expected Level of Work Stability without Data Transformation



Since the range of response variables Y_{reg} is [-100, 100], the range of X_2 is [0, 10], and the range of X_3 is [0, 3.04). The direction of the change of paired dependent variable expected level of work stability Y_{reg} does not matter much in the linear

regression part. Therefore, the absolute value of the response variable $|Y_{reg}|$ is used. $|Y_{reg}|+1$ make sure the range is always positive. In order to match the scale of the response variable and the terms, we perform $\log_{10}(|Y_{reg}|+1)$ for the change of expected level of work stability. Let $Y_T \coloneqq \log_{10}(|Y_{reg}|+1)$ instead of Y_{reg} be the new response variable in linear regression.

5.4.3. Model Analysis

The models are constructed by the combination of $Y_{reg}, Y_T, X_1, X_2, X_3$. For the single linear regression cases, the model I $Y_T \sim X_1$ and model II $Y_T \sim X_2$ are significantly different from $Y_T \sim 1$ under significance level $\alpha = 0.05$ [Table 7 & Table 8]. But the residual plots of these two models show that the variance is not constant [Figure 6]. Besides, leverage points still affect model I.

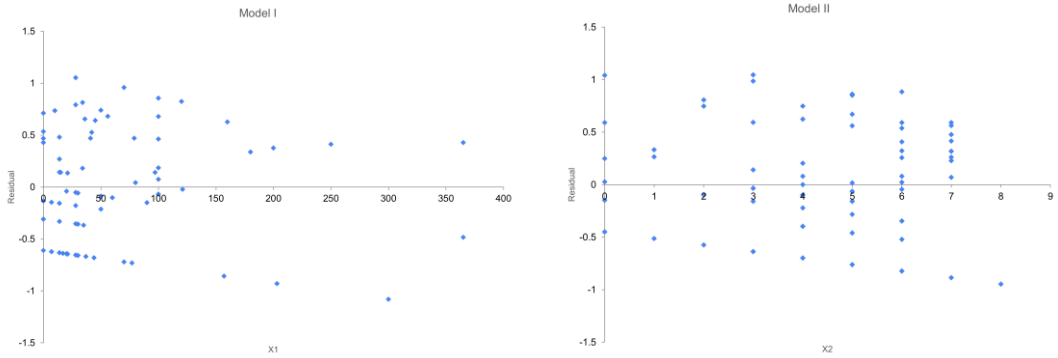
Table 7: ANOVA Table for Model I

Model I	*df*	*SS*	*MS*	*F*	*p-value*
Reg	1	1.15	1.15	3.96	0.05
Res	78	22.72	0.29		
Total	79	23.88			

Table 8: ANOVA Table for Model II

Model II	*df*	*SS*	*MS*	*F*	*p-value*
Reg	1	1.51	1.51	5.27	0.02
Res	78	22.37	0.29		
Total	79	23.88			

Figure 6: Residual Plot for Model I and II

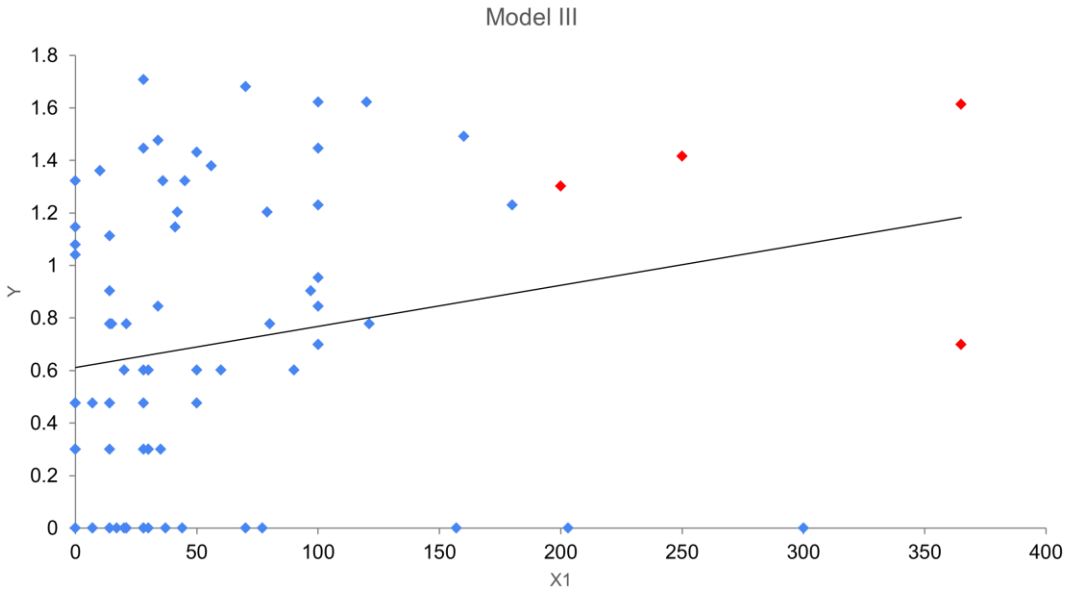


For multiple linear regression cases, model III $Y_T \sim X_1 + X_2$ has p-values lower than 0.05 [Table 9]. Even though the p-value is low and the adjusted R-squared is 0.086, the problem of highly right-skewed X_1 (leverage points) still exits [Figure 7].

Table 9: ANOVA Table for Model III

Model III	*df*	*SS*	*MS*	*F*	*p-value*
Reg	2	2.612522	1.306261	4.730341	0.011544
Res	77	21.26318	0.276145		
Total	79	23.8757			

Figure 7: Scatter Plot for Model III with Leverage Points in Red



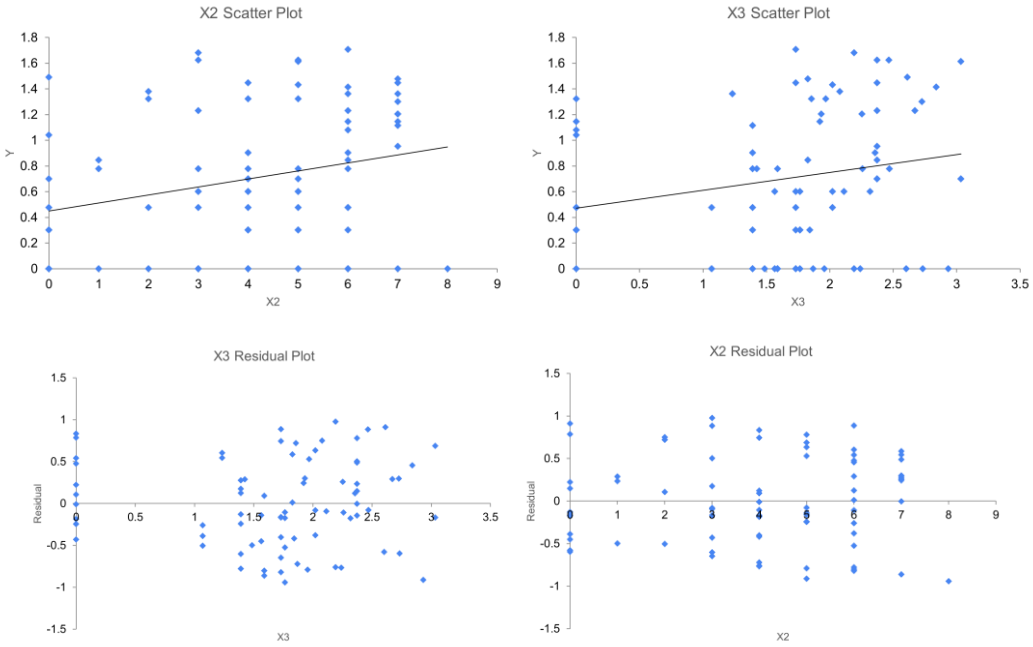
Therefore, model IV is designed to be $Y_T \sim X_2 + X_3$. The p-value of the model is 0.019, which is smaller than the significance level $\alpha = 0.05$ [Table 10]. The adjusted R-squared is 0.074. There is no sign of leverage points in the scatter plots. The residual plots also show that the mean and variance are approximately constant [Figure 8]. Therefore, we can conclude that Model IV can represent the relationship between the change in the expected level of work stability and quarantine and lockdown time & understanding of redundancy conditions.

Model IV: $Y_T = 0.058 \times X_2 + 0.125 \times X_3 + 0.196$

Table 10: ANOVA Table for Model IV

Model IV	*df*	*SS*	*MS*	*F*	*p-value*
Reg	2	2.333769	1.166884	4.17094	0.019061
Res	77	21.54193	0.279765		
Total	79	23.8757			

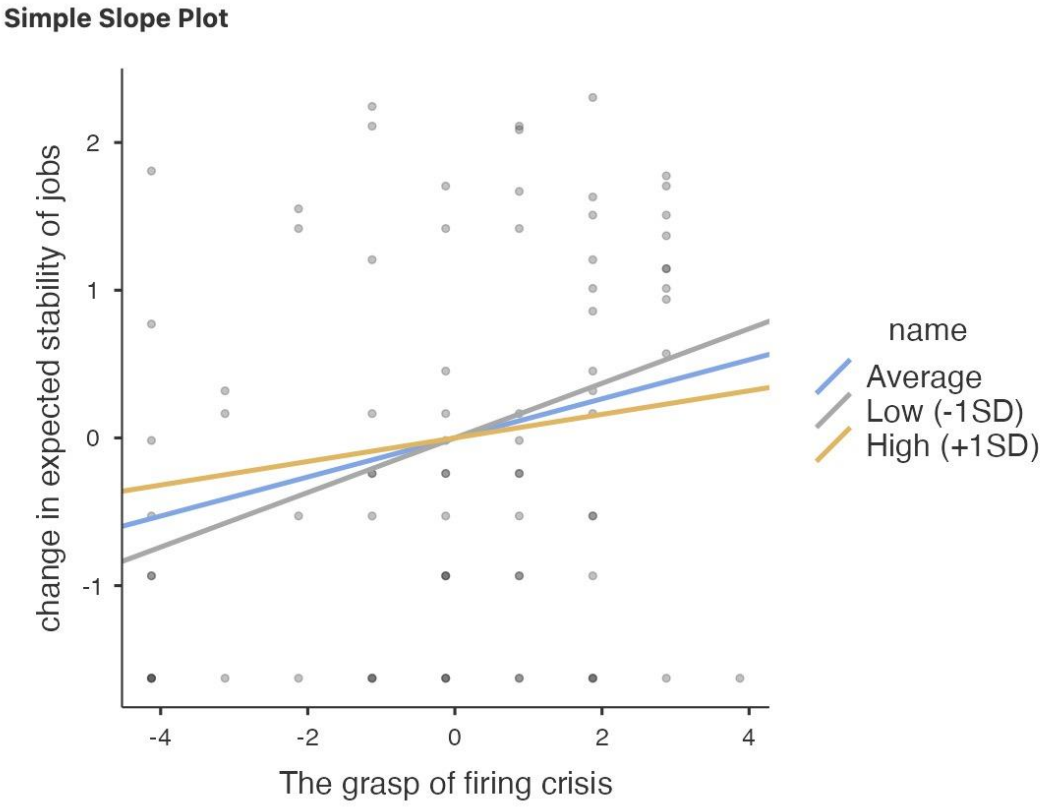
Figure 8: Scatter Plots & Residual Plots for Model IV



5.4.4. Moderation Effect

After fitting the best model between the response variable and explanatory variables. Understanding whether the independent variables that are not related to Covid-19 have some influence can help us better understand the model. Let X_i $(i \in [4,14])$ denote the moderators. We test all the moderation effects in Jamovi. Under significance level $\alpha = 0.05$, only family income has a moderation effect, which can be interpreted as changes in the expected level of work stability of lower family income university students group tends to be more sensitive to the understanding of redundancy conditions. In other words, for university students with lower family income, the more they know about the redundancy conditions, the bigger changes in the expected level of work stability will be made [Figure 9].

Figure 9: Moderation Effect for Family Income



6. Qualitative Analysis

6.1. Interview introduction

The study is another part of the "Employment Preference for Chinese College Students during the Pandemic" research project. In this session, we designed interview questions for the research topic and interviewed a total number of 18 college students from October 2nd to October 12th. It would be followed by a qualitative analysis of the collected interview information.

6.1.1. Participants and setting

Under privacy protection, the demographics of the interviewees are as follows: the participants included 13 females and 5 males, ranging in age from 18 to 25 years old. Among them, 6 participants are attending universities in Mainland China and 11 participants are studying at the Chinese University of Hong Kong and 1 participant is in the UK. In addition, the majors they study include various categories in social sciences, literature and education, business administration, science, and engineering. Respondents were recruited by either leaving contact information at the end of the questionnaire we designed before or by a direct email invitation requesting participation.

The criteria for inclusion consisted of attending a university in China and considering further education or job hunting, and availability to participate in a face-to-face or online interview, which would be recorded. Prior to each interview, the interviewers interpreted the objective of the study and confidentiality. All interviewees expressed agreement with participation in the study.

6.1.2. Data collection

Data collection was conducted by semi-structured interviews, that is, informal interviews following a rough predetermined thematic framework, with only a basic requirement for the questions to be asked (Tegan, 2022). The duration of the interview was focused between 10-20 minutes. Participants were invited to introduce themselves at the beginning of the session to collect their demographic information, such as name, age, gender, and educational background. All interviews were audio and text transcribed for analysis.

6.1.3. Analysis method

The analysis of the data was conducted with reference to reflective thematic analysis, which involves data familiarity, data coding, and thematic development (Braun et al., 2019), for inductive summarization of textual data. Interview transcripts were transcribed by two research team members collaborating to identify initial codes. Initial themes and frameworks were then generated and further refined. Throughout the analysis process, group members worked together to discuss and reach consensus on the overview and understanding of the interview content in order to avoid bias from individual interpretations, so that to ensure the accuracy and reliability of the analysis. The content of each interview was recorded in a short overview to help us get familiar with the content, so as to build frameworks and analyze texts more accurately.

6.2. Inductive conclusion

The data analysis indicated four major themes that were related to career choice intentions, difficulty in employment, and personal competitiveness. The themes include college students considering comprehensively in choosing a job, job hunting becoming tougher with changes in the social environment, individual competitiveness of college students in job hunting tends to weaker and some students prefer higher education under employment pressure. These themes and their corresponding subthemes would be described and elaborated on below.

6.2.1. College students consider comprehensively in choosing a job

Interviewees agreed that when seeking a job or determining the industry they would like to enter in the future, they would consider a combination of several factors that they identified as important, which primarily include income level, job stability, working city, personal interest, and college major.

Income level

In terms of income levels, interviewees tended to choose jobs with high salaries or industries that were popular under the epidemic which offer higher incomes. They believed that the economic development downturn in China during the epidemic made many industries and companies to have difficulties in doing business. Some companies, in an effort to reduce costs, would pay new employees at a level lower than what previous employees were paid when they first joined the company. As a result, interviewees expressed that they may lower their salary expectations, but still hope to pursue jobs with a relatively higher salary in the terrible job market or consider some industries that became more popular under Covid-19, such as medical, health care, and psychological counseling, which may also have relatively higher salaries. Reflected in transcript such as.

"Since the pandemic, the depressed population in China has risen sharply, and it would be a better choice to enter the medical system or to enter some companies that specialize in psychological counseling, so as to earn more money."

Job stability

Stability is also an important factor for the interviewees in their job search. It was stated that, under the epidemic, many companies laid off and downsized their staff, which could not be avoided by such top-tier companies as Tencent, Alibaba, Jingdong, etc. To avoid the risk of unemployment, the interviewees agreed that they would value stability more than in the past, and would consider public-sector jobs and civil servants, which are called "iron rice bowls". Reflected in transcript such as.

"I would like to seek stability in employment, such as civil servant. It will not suddenly be laid off because of the impact of the epidemic on the job market environment, so I would like to try on a more stable job position."

Working city

For the working city, interviewees would consider development prospects, social environment, and geographic location. The development prospect refers to whether their career has better opportunities and space for upward mobility in the city; the social environment will include politics, economy, culture, and anti-epidemic measures of the

city; and the geographical location will hopefully be not too far from their hometown and family. Reflected in transcript such as.

"After the epidemic, I grew to like Hong Kong and Singapore more, because they have a more humane policy on epidemic prevention and also have the opportunity for better career development."

Personal interest and college major

Interest and major were also factors that interviewees would consider when looking for a job. They thought that for long-term development, they cannot do work that they are not interested in at all. Moreover, some of their majors are professional, which would determine the direction of their future careers. Reflected in transcript such as.

"I am studying engineering, and engineers are professional people, so my future career will be focused on these professional jobs."

6.2.2. Job hunting becomes tougher with changes in the social environment

During the pandemic, the difficulty of employment for college students increased, mainly in the three areas of public-sector jobs, corporate jobs, and internships.

Public-sector jobs

The difficulty of employment in public sector jobs is mainly reflected in the increased competition, changes in hiring policies, and higher job requirements. First, interviewees believed that under the pandemic, public sector jobs have become more attractive to more job seekers than other positions due to their greater stability, so the recruitment process became more competitive. Secondly, they also indicated that the hiring policy of civil servants has been loosened for social recruitment in recent years, thus increasing the number of experienced job seekers competing with fresh graduates for the same position and making it more difficult to obtain a job. Lastly, interviewees expressed concern about their education degree. The public sector jobs' requirements for education became higher, trying to recruit candidates with advanced degrees. Reflected in transcript such as.

"The requirements for civil service examinations have been loosened, and some positions are no longer restricted to fresh graduates, so this is actually increasing the difficulty of job seeking for college students."

Corporate jobs

During the epidemic, it became harder for many companies to survive, leading to a slump in the job market and making employment more difficult. Interviewees revealed that small and medium-sized enterprises had difficulty surviving, with many of them

struggling to operate due to the epidemic's restrictions on transportation and policies. The worst result was leading to closures. And these dismissed, experienced employees re-enter the recruitment market, making the already limited positions more competitive, and the employment pressure on college students without work experience became tougher. Reflected in transcript such as.

"I knew about the downsizing situation, and if you're being laid off and other companies are laying off, it's even harder to find a job."

Internships

In keeping with the epidemic prevention policy, many college students were also having unprecedented trouble finding internship jobs. Interviewees suggested that epidemic prevention measures in the mainland were complex, and some universities chose to block schools to prevent the spread of COVID-19. Therefore, it is difficult for college students to find internships across regions under the control of the policy, and they can only find internships locally. For some students in non-first-tier cities, their local companies offered fewer jobs, making competition even fiercer. The worst situation would be to stay in school and not be able to go out for an internship, but the effect of an online internship on personal improvement is much smaller than an offline internship. Reflected in transcript such as.

"It's harder to find a job offline. My seniors used to be able to go to Beijing and Shanghai for internships, but now there are more uncertainties and any place may become a medium or high-risk area."

6.2.3. Individual competitiveness of college students in job hunting tends to weaker

During the years of the pandemic, balancing the external social environment and internal personal capabilities, the competitiveness of individuals in the job market reflected a relative weakening trend, mainly in three aspects: the depreciation of academic qualifications, the increase in job requirements, and the prevalence of involutional culture.

Depreciation of academic qualifications

When there are more and more people with the same education, the education depreciates in value, resulting in individuals being less competitive in the job market than before. Interviewees indicated that the number of college students as well as the number of students pursuing higher degrees were increasing in recent years. Because China launched policies to encourage university expansion in previous years, it appeared in recent years that there would be more graduates than in past years.

Therefore, it may intensify the phenomenon of job shortage. When more students with the same educational background are flooded into the job market at the same time, compared to the past, the competitiveness of individuals will seem weaker. Even though many graduates from famous universities struggle to find jobs, interviewees expressed their concern that their personal competitiveness is relatively weaker. Reflected in transcript such as.

"My own ability may be unchanged, but because of fewer positions and greater competition, my personal competitiveness will seem slightly weaker."

Increased job requirements

Interviewees revealed that the increase in job requirements also made individuals relatively less competitive in the job market. On the one hand, under the pandemic, many college students are unable to find internships, but positions require students to have internship experience. On the other hand, there is a phenomenon of degree outweighing school. Recruiters would value the level of degree more than the merits of the school. For example, a master's or Ph.D. degree will be more important than an excellent undergraduate university. Moreover, many jobs that previously allowed undergraduate students to apply for now require a master's degree or above. Reflected in transcript such as.

"I feel like I'm getting less and less competitive. The job that could be done with a bachelor's degree now the minimum requirement for education becomes master."

The prevailing culture of involution

In recent years, as the situation became harder to find a job, many people's self-imposed requirements and work standards became higher and higher, which is also known as the " involution culture " and led to a relatively low competitiveness among other candidates. Interviewees pointed out that although their own personal abilities have remained the same or improved, more and more people are constantly demanding higher standards from themselves because of the prevalence of involutional culture, pulling up the standard for a thing to be completed or done well. That is, in the past, a task completed is up to standard, but now, not only to complete but also to do it better, in order to be regarded as up to standard. In this situation, if there is no synchronization to raise their own standards, then relatively speaking, personal competitiveness is becoming weaker. Reflected in transcript such as.

"Involution in the Mainland is very serious, some people may not be able to find a job with the same degree, then will go on to get a master's or Ph.D."

6.2.4. Some students prefer higher education under employment pressure

Under the pressure of employment in a poor job market environment, college students may consider local or overseas study depending on their situation and circumstances.

Personal Background

Comprehensive information about personal background is the reason why interviewees would consider pursuing further education. On the one hand, they stated that many new graduates would not be able to find suitable jobs during the pandemic so applying for advanced education at higher degrees would be a temporary way to relieve the current employment pressure. In addition, the interviewees also felt that the personal mental stress in the pandemic society itself is very high. Because of the pandemic prevention measures and government controls that seriously affect their daily lives, they are in a poor state of mind and find it difficult to balance job hunting and have to continue studying instead. But at the same time, it is unavoidable that more and more people choose to go on to higher education, making it more difficult to pursue higher education and advanced studies as well. Reflected in transcript such as.

"The pressure piled up, plus some policies, such as closing campus and routinely doing nucleic acid, made me feel not good mentally, and now you can see a lot of "crazy literature" on the Internet."

Local study and further education

Some interviewees expressed that they would consider studying locally. On the one hand, it is because the national policy encourages postgraduate studies or other higher degrees. On the other hand, because of the relaxed epidemic prevention policies abroad, they are fearful of getting sick overseas, and therefore do not intend to study abroad. However, the disadvantage of studying locally is that the current epidemic prevention measures and management on the mainland are still very complicated and troublesome. Reflected in transcript such as.

"Because the epidemic is ongoing, we are actually adding a lot of guaranteed places for masters in our department starting in 2021. This will help more students to go on to higher education locally."

Overseas study and further education

Some interviewees expressed that they would consider studying overseas. First, many Chinese students will be reluctant to study abroad because of the obstruction of the pandemic. Therefore, the competition for overseas study became less and the difficulty of the further study was reduced compared to the past, which is a good opportunity for some students. And some other reasons, like the spread of COVID-19 abroad, seem

serious in contrast to the clearance policy in China, and the need to face complicated segregation policies when returning from abroad makes studying abroad more difficult. At the same time, various considerations of the external environment can make many families disagree with their children studying abroad for further education. However, a large proportion of interviewees in our interview group are currently studying at the Chinese University of Hong Kong. For them, it is very difficult to return to the mainland for further studies, so they would prefer to study overseas. Reflected in transcript such as.

"Recently, I think the pandemic prevention and control in China is too torturous, so I don't want to come back and wish to stay abroad."

7. Conclusions

7.1. Conclusion for Hypothesis 1

Hypothesis 1: After the explosion of COVID-19, students' employment choice has become more conservative.

We designed relevant questions for our first hypothesis at the beginning of designing the questionnaire. For example, we will ask participants to estimate real wages before and after the epidemic, in order to judge the changes in their job expectations before and after the epidemic. There is also the degree of longing for a career as a civil servant, and whether the career chosen after graduation matches the major of one's own university, so as to judge the conservative tendency of Chinese college students toward work. Likewise, we asked participants about their city choices for work before and after the pandemic. Whether they choose overseas cities with more opportunities and challenges such as first-tier cities or go to second-tier cities or their hometowns to obtain a stable job. After summarizing and analyzing the answers to all these questions, for our first hypothesis, we conclude that:

1. After Covdi-19, a significant shift occurred in graduates' expected stability of work, especially towards the more conservative side.
2. Graduates' preference for cities generally shifted from 1-st tier cities to medium or small-sized cities.

7.2. Conclusion for Hypothesis 2

Hypothesis 2: The extent to which Covid-19 can influence students' employment choices differ by college students' gender, year level, and family income (demographic factors).

In our survey and afterward investigation and analysis, gender, year level, family

background, and employment choices are set as independent variables that can be shown in the data analysis part of our research. However, for hypothesis 2, our finding is that only family income has a moderate effect on the predictive relationship between "the understanding of redundancy conditions" and the "difference of expected work stability before and after Covid-19".

8. Discussion

8.1. Comparisons with Others' Findings

In the process of our research, we also referred to many previous studies and conclusions and compared them, and found the similarities and differences between us and the previous research results.

8.1.1. Similar to Our Findings

In his article *Analysis of College Students' Employment Strategies under the Epidemic of New Coronary Pneumonia*, Liu Ke pointed out that many college students are forced to choose postgraduate diplomas to delay their employment under the harsh employment environment affected by the epidemic. (Liu, 2020) His findings are consistent with ours. Our surveys and interviews also found that more and more college students choose to pursue advanced studies, some to improve their employment competitiveness before direct employment, some to delay employment time.

Li Chunling, a researcher at the Institute of Sociology of the Chinese Academy of Social Sciences, found in her article *College Students' Employment under the Impact of the Epidemic: Employment Pressure, Psychological Pressure, and Changes in Employment Choices* that college graduates tend to lower their employment expectations to reduce risks. (Li, 2020) This coincides with our findings. We also found that college students are more inclined to choose more stable jobs during the epidemic situation, and their salary expectations have decreased.

8.1.2. Different with Our Findings

Of course, we also found that our findings are somewhat different from other people's results.

In the articles *The impact of the coronavirus pandemic on gender equality and Disparate Disruptions: Intersectional COVID-19 Employment Effects by Age, Gender, Education, and Race/ethnicity*, there are sentences *"The lockdowns triggered by COVID-19 are taking a disproportionate toll on women in the labor market, as the*

sectors with high rates of female employment are experiencing heavier job losses while increased childcare needs during school closures exert an outsized impact on working mothers." (Alon et al., 2020) and *"There are increases in unemployment and being out of the workforce at all ages, but especially among young adults, with young women most at risk. Intersectional analyses document conjoint life-course vulnerabilities by gender, educational attainment, and race/ethnicity. For example, Black men aged 20–29 with a college degree experienced a 12.4 percentage point increase in being not in the labor force for other reasons (NILF-other)."* (Moen et al., 2020) respectively. However, as our conclusions indicated, family income is the only moderator, which may be due to our unequal gender distribution of samples.

Due to space limitations, there are many similarities and differences that have not been mentioned. We hope that our findings can also provide some reference value for later research.

8.2. Limitations

Although our investigation, analysis and research strive to be as good as possible, we need to acknowledge that there are many limitations in our research. In our future research, these limitations need us to improve and overcome, so as to obtain more comprehensive and accurate results.

8.2.1. Limitations on Generalization

The generalization aspects of our research are multifaceted. First and foremost is the geographical distribution of our study samples. Our samples were pooled from the respective hometowns of our research team members. Among them, samples from Xinjiang even accounted for 25 percent. Secondly, our samples are mostly concentrated in China's developed coastal provinces such as Jiangsu and Guangdong. Samples from inland provinces such as Qinghai, Gansu, and Guizhou are even missing. China is a very large country with complex administrative divisions. The level of economic development, local policies, cultural characteristics, and natural environment of each region are also very different. This has led to different impacts of the epidemic on different places. Considering these differences, whether our findings can also be applied to regions not covered by our samples requires further research and analysis. In addition, our research samples did not include Chinese students studying abroad. Foreign cultural customs will bring them different ways of thinking, and their employment choices also need to be taken into consideration and comprehensively researched.

Another limitation of our study is that the gender distribution of our sample is extremely uneven. In our samples, 66 percent of the participants were female, 31 percent were male, and 3 percent did not disclose their gender. This means that even if the 3% of participants who did not disclose their gender were all men, the ratio of men to women in our samples would still be unbalanced 1 over 2. In our hypothesis 2, gender is also an important variable. If we have more male samples for reference and analysis, whether our conclusion is as stated, only family income has a moderation effect on the predictive relationship between “the understanding of redundancy condition” and “difference of expected work stability before and after COVID-19”, is still open to question and needs further research and confirmation.

Another limitation that cannot be ignored is the complete absence of participants from occupational colleges in our study. But they also belong to college students, are also included in our research object, and also face the problem of employment choice. According to the 2021 National Statistical Bulletin on Educational Development issued by the Ministry of Education of the People's Republic of China, 4.446 million undergraduates were enrolled in general undergraduate programs and 5.5258 million were enrolled in higher vocational (specialist) programs. (Cao, 2022) Statistics show that China has a huge base of occupational college students, and more than half of college students are occupational college students. And the complete absence of junior college students in our sample is bound to affect the external validity of the research results. The reason for this limitation may be that the main scope of our questionnaire distribution is the social circle of our panelists.

8.2.2. Limitations of Other Factors

A serious limitation of our research is the extremely low effective questionnaire rate. We received about 160 questionnaire responses in total, but nearly half of the questionnaires after screening were invalid questionnaires.

Our data is highly scaled, if we apply the CLT method, there might be vias. The paired t-test can be used only when it is normally distributed. This can be checked using the Shapiro-Wilk test. The details need to be investigated further. Since we do not know the exact direction for each test, we use a two-tailed hypothesis. However, the real situation is that the pandemic can only step forward monodirectional. To analyze the days of quarantine, we conducted a logarithm to perform the data transformation, but the weight might be possibly larger than others. In addition, there exist too many multiple linear regression interactions, it is too complicated to cover all aspects to obtain the final results. As we mentioned in our limitations, our data is highly scaled,

one of the possible reasons is that many of our samples are students from Hong Kong, but Hong Kong is just a special administration region of China, which can't cover total China.

At the same time, the distribution and recovery of our questionnaires are concentrated in September and October. But in the following days, the epidemic prevention policy has undergone considerable changes. For example, mainland China canceled the circuit breaker mechanism for overseas flights and reduced the time for centralized quarantine. Hong Kong, China has canceled the centralized quarantine policy for overseas arrivals to Hong Kong. We have to admit that if our questionnaires are distributed after these policies are issued, the samples we recover may have some changes, which will affect our final analysis and results. The impact of the epidemic policy should also be included in the consideration of hypotheses.

Along with the policy changes, people's views on the epidemic have also changed. After experiencing many times of quarantine and closure, we found that many students have become numb from the fear of the epidemic from the beginning to the present. The impact of the epidemic on a growing number of students is gradually waning. Our research also found that many students have not changed their plans to study or work overseas even when the epidemic is still prevailing.

8.3. Implications

Based on our research results, we hereby offer the following implications for the following objects.

8.3.1. For Policy Makers

Policymakers could extend the job search time for college graduates beyond just the fall and spring. A large number of graduates seeking jobs at the same time will inevitably overwhelm the employment resource severely. At the same time, policymakers can also actively build a contact platform between schools and enterprises to provide better employment options for university graduates by promoting cooperation between universities and enterprises.

8.3.2. For Universities

Universities can provide students with more detailed career guidance, which is particularly important in the context of job losses caused by the epidemic. At the same time, the psychological pressure of the long-term epidemic on college students cannot be ignored, and anxiety is inevitable when the employment environment is not

optimistic. Schools can provide schools with psychological counseling to relieve employment anxiety.

8.3.3. For Enterprises

The economic depression brought about by the epidemic is also a blow to the enterprises. However, they can hold more recruitment lectures at universities to give students more opportunities to understand the concept and process of job hunting. At the same time, a new interview method brought about by the epidemic-online interviews also has the possibility of information asymmetry. Enterprises should make recruitment information as transparent and detailed as possible (Li, 2020).

8.3.4. For Students

At the moment when the epidemic is raging, no one can escape from it. In this case, it is particularly important to improve the psychological resistance to stress. We believe that college students need to realize this reality early on and strengthen their own personal capabilities. With the help of the school and family, they should plan the employment plan early.

8.4. Further Research Direction

After realizing the limitations of our research, we will conduct research in the following directions in the future to make our research results more general and valid.

1. Implement our research on occupational college students to make it more generalized.
2. To test whether political factors have a moderation effect on the relationship between COVID-19 and employment choices.
3. To test whether the mental changes caused by the pandemic influence employment choice.

9. References

Alon, T. (2020). The impact of the coronavirus pandemic on gender equality. Covid Economics Vetted and Real-Time Papers, 4, 62–85.

Aucejo, E. M., French, J., Ugalde Araya, M. P., & Zafar, B. (2020). The impact of COVID-19 on student experiences and expectations: Evidence from a survey. Journal of Public Economics, 191, 104271–104271. https://doi.org/10.1016/j.jpubeco.2020.104271

Braun V., Clarke V., Hayfield N., & Terry G. (2019). Thematic Analysis. Retrieved from https://link.springer.com/referenceworkentry/10.1007/978-981-10-2779-6_103-1

Huang, R. (2021). Influence of Epidemic Situation on Employment of College Graduates and Informatization Countermeasures. E3S Web of Conferences, 235, 3069–. https://doi.org/10.1051/e3sconf/202123503069

Liu, X. (2021). Analysis on Employment Status of College Graduates during the COVID-19 Pandemic. Atlantis Press, 203.

Mao, Y., Zhang, Y., Bai, J., Zhang, L., Hu, W. (2022) The impact of COVID-19 on the employment status and psychological expectations of college graduates: Empirical evidence from the survey data of Chinese recruitment websites. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.1039945

Moen, P., Pedtke, J. H., & Flood, S. (2020). Disparate disruptions: Intersectional COVID-19 employment effects by age, gender, education, and race/ethnicity. Work, Aging and Retirement, 6(4), 207–228. https://doi.org/10.1093/workar/waaa013

Mok, K. H., Xiong, W., Ke, G., & Cheung, J. O. W. (2021). Impact of COVID-19 pandemic on international higher education and student mobility: Student perspectives from mainland China and Hong Kong. International Journal of Educational Research, 105, 101718 - 101718. https://doi.org/10.1016/j.ijer.2020.101718

Shahriar, M. S., Islam, K. M. A., Zayed, N. M., Hasan, K. B. M. R., & Raisa, T. S.

(2021). The Impact of COVID-19 on Bangladesh's Economy: A Focus on Graduate Employability. The Journal of Asian Finance, Economics, and Business, 8(3), 1395–1403. https://doi.org/10.13106/jafeb.2021.vol8.no3.1395

Tegan George. (2022). Semi-Structured Interview | Definition, Guide & Examples. Retrieved from https://www.scribbr.com/methodology/semi-structured-interview/

曹建. (2021). 2021 年全国教育事业发展统计公报. 中华人民共和国教育部. Retrieved from http://www.moe.gov.cn/jyb_sjzl/sjzl_fztjgb/202209/t20220914_660850.html

李春玲. (2020). 疫情冲击下的大学生就业: 就业压力, 心理压力与就业选择变化. 教育研究, 41(7), 4-16.

刘柯. (2020). 新冠肺炎疫情下大学生就业对策探析. 就业与保障, 7, 182-183.

宋思成, & 张继伟. (2021). 疫情下就业政策对高校毕业生就业预期的影响. 合作经济与科技, 11, 93–95. https://doi.org/10.3969/j.issn.1672-190X.2021.11.038

10. Appendix

10.1. Appendix 1: The Questionnaire (WJX form)
10.2. Appendix 2: Result of the Survey (Total)
10.3. Appendix 3: Result of the Survey (Valid)
10.4. Appendix 4: The Interview Question
10.5. Appendix 5: The Transcript of 18 Interviews
10.6. Appendix 6: R code for Data Analysis
10.7. Appendix 7: Presentation Slides