

Analysis of Factors Affecting the Number of Graduate Students based on Eviews Software

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Abstract

With the rapid development of the current economy, the requirements for academic qualifications are gradually increasing. And now the number of graduates is gradually increasing, resulting in a shortage of jobs. For some undergraduates with poor first degree, postgraduate entrance examination has become an effective way for them to achieve their goals. This article will use Eviews to analyze the data on the number of postgraduate entrance examinations from 2008 to 2019, analyze the "internal volume" status of postgraduate entrance examinations from the GDP, the number of graduates, and the number of students studying abroad, and predict the regularity of changes in the number of postgraduate entrance examinations. How students choose a way out is of great significance.

Keywords

Number of Postgraduate Entrance Exams; GDP; Number of Graduates; Number of Students Studying Abroad.

1. Introduction

As the graduation season is approaching, in recent years, the number of graduates in China has been increasing, hitting a record high, and the difficulty of finding employment has been repeatedly mentioned. The choice of employment or postgraduate entrance examination for college students is very important, which is related to social development, economic upgrading and people's livelihood stability. On the one hand, it is believed that it is an era of academic expansion. Undergraduate education has no advantage in employment competition, and the light load of undergraduate coursework cannot meet the market's demand for professional compound talents, resulting in a triangular distribution with a large number of people at the bottom. There is a shortage of high-calibre talents. On the other hand, the phenomenon of "internal paper" in the postgraduate entrance examination is serious, and the enrollment is far from being able to meet the needs of the number of applicants, which is different from the previous form, resulting in many people falling off the list. This article uses econometric theory to objectively describe the current situation of postgraduate entrance examination from the aspects of GDP, number of graduates, and number of students studying abroad. It is hoped that fresh graduates can see the form clearly and not blindly follow the trend of postgraduate entrance examination and miss the good time of campus recruitment, and reduce costs to achieve Maximize benefits.

In order to better understand the influencing factors of the changes in the number of graduate students and the current scale of the number of graduate students, this analysis is also to help you become a prospective junior who will choose employment or graduate school. The theoretical basis for the choice of the above questions That is the purpose of my research.

2. Model Setting and Parameter Estimation

2.1. Influencing Factors

(1) Gross domestic product (x_1): A country 's GDP has a direct impact on the number of people who take the postgraduate entrance examination. According to Maslow's Hierarchy of Needs theory, when the economic level reaches a certain level, people meet the needs of middle and low levels such as physiology, safety, and social interaction . After that, I began to pursue the needs of respect and self-worth realization, and realized my self-worth and the respect of others through the improvement of academic qualifications.

(2)The number of graduates (x_2): The increase in the number of graduates increases the market competition. When the demand is far greater than the supply, it is necessary to improve their hard conditions to obtain employment rights and a better living standard.

(3) Number of students studying abroad (x_3): "Double first-class" students are more inclined to have overseas study experience. When the number of overseas students decreases, some high-quality students will join the postgraduate entrance examination army.

(4) Other factors (ϵ): the average income ϵ of undergraduates after graduation, the average income of graduate students, the pressure of society and undergraduates, the expectations of parents and themselves, etc.

2.2. Establish an Econometric Model

Table 1. 2008-2019 postgraduate entrance examination number and its influencing factors data

years	Number of applicants y /10,000 people	gross domestic product x_1 /100 million yuan	Number of graduates x_2 /10,000 people	Number of students studying abroad x_3 /10,000 people
2008	120.00	319515.50	559.00	18.00
2009	124.60	349081.40	611.00	22.90
2010	140.60	413030.30	631.00	28.50
2011	151.10	489300.60	660.00	34.40
2012	165.60	540367.40	680.00	40.00
2013	176.00	595244.40	699.00	41.40
2014	172.00	643974.00	727.00	46.00
2015	164.90	689052.10	749.00	52.40
2016	177.00	744127.20	765.00	54.50
2017	201.00	832035.90	795.00	60.80
2018	238.00	919281.10	820.00	66.20
2019	290.00	986515.00	834.00	70.35

In order to study the relationship between the influencing factors of the number of students admitted to the postgraduate entrance examination and the number of postgraduate entrance examinations. Relevant data from 2008 to 2019 were obtained from the National Statistical Network . As shown in the table 1.

To analyze and estimate the model parameters in the table. First create a working file in the software, then enter the data y x1 x2 x3 command in the Eviews software command box , and copy and paste the above data in the corresponding box that pops up. In order to first observe and understand the relationship between the data, scatter plots were made.

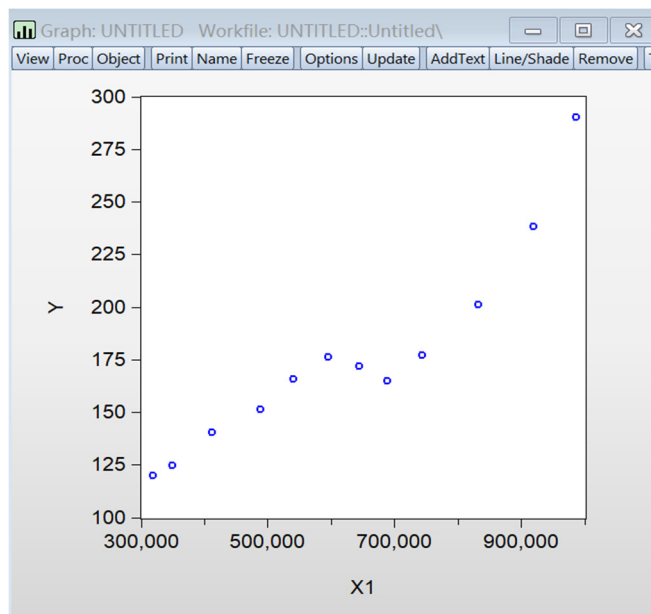


Figure 1. Scatter plot of the number of people admitted to postgraduate entrance examinations and GDP

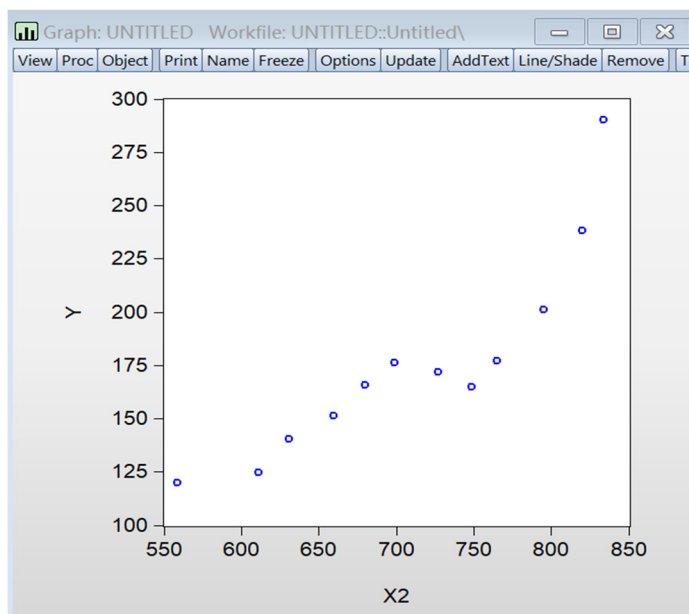


Figure 2. Scatter plot of the number of postgraduate entrance examinations and the number of graduates

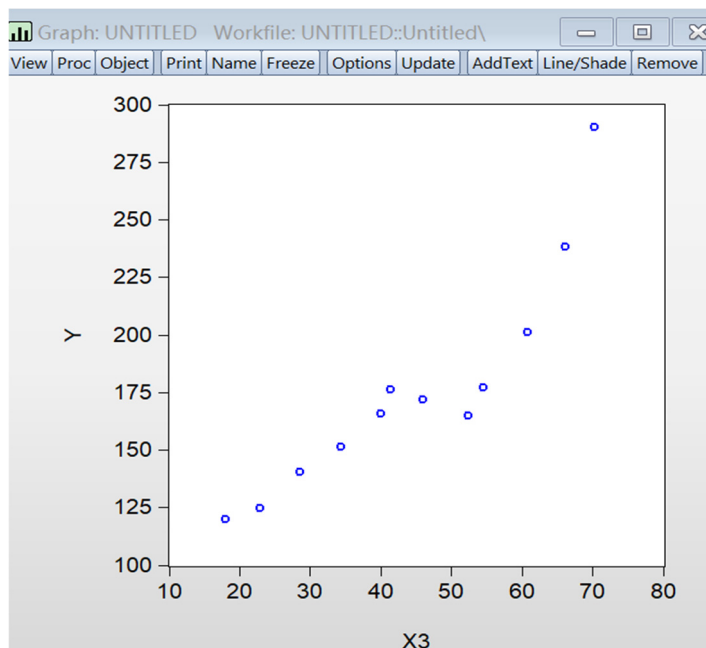


Figure 3. Scatter plot of the number of postgraduate entrance exams and the number of students studying abroad

There is a positive linear correlation between the above three explanatory variables and the explained variables, so the model is established:

$$y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \varepsilon$$

3. Multiple Linear Regression Model Test

Use Eviews to estimate the model parameters, enter l syc x1 x2 x3 in the command, and the result obtained after pressing Enter is shown in the following figure:

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	230.6622	326.2711	0.706965	0.4997
X1	0.000665	0.000242	2.743597	0.0253
X2	-0.424525	0.665125	-0.638264	0.5411
X3	-3.790753	5.306871	-0.714310	0.4953

R-squared	0.921777	Mean dependent var	176.7333
Adjusted R-squared	0.892443	S.D. dependent var	48.01330
S.E. of regression	15.74638	Akaike info criterion	8.612300
Sum squared resid	1983.588	Schwarz criterion	8.773935
Log likelihood	-47.67380	Hannan-Quinn criter.	8.552456
F-statistic	31.42381	Durbin-Watson stat	1.040608
Prob(F-statistic)	0.000089		

Figure 4. Regression model

Regression model:

$$\hat{y} = 230.6622 + 0.0007x_1 - 0.4245x_2 - 3.7908x_3$$

(326.2711) (0.0002) (0.6651) (5.3069)

$$T=(0.7070) \quad (2.7436) \quad (-0.6383) \quad (-0.7143)$$

$$R^2=0.9218 \quad F=31.4238 \quad n=12$$

3.1. Economic Significance Test

It can be seen from the model that, assuming other conditions remain unchanged, for every 100 million yuan increase in GDP, the number of postgraduate entrance exams increases by 0.0007 million, and for every 10,000 increase in graduates, the number of postgraduate entrance examinations decreases by 0.4245 million. For every 10,000 increase in the number of students studying abroad, the number of postgraduate entrance exams decreased by 37,908. The results of the number of graduates and the number of postgraduate entrance examinations are inconsistent with theoretical analysis and empirical judgments, which are then tested by econometrics.

3.2. Statistical Test

(1) Goodness of fit test

Through data y, x_1, x_2, x_3 , the test results obtained by establishing a large regression l $sync, x_1, x_2, x_3$ are as follows:

Variable	Coefficient	Std. Error	t-Statistic	Prob.
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Figure 5. Big regression results

that $R^2=0.9218 > 0.8$ the selected explanatory variable is the main factor causing the change of the explained variable, and the adjusted coefficient of determination is also greater than 0.8, which means that it is not established because there are many explanatory variables. The model fits the sample well.

(2) T- test

$H_0 : \beta_i=0 (i=1,2,3)$, a significance level of $\alpha = 0.05$ is given. According to the above figure, the values of the t-statistics corresponding to the explanatory variables are 2.7436, -0.6383, -0.7143, respectively, then the corresponding p values are 0.0253, 0.5411, 0.4953 in x_2, x_3 corresponding to $p > 0.05$, so accept The null hypothesis, the t-test failed. But now there is no need to blindly delete explanatory variables because it may violate multicollinearity, heteroscedasticity or autocorrelation in econometric tests.

(3) F test

$H_0 : \beta_1=\beta_2=\beta_3=0$, given the significance level $\alpha = 0.05$, according to the above figure, the corresponding $p = 0.000089 < 0.05$ of the F value, so the rejection of the null hypothesis is true, otherwise it is 0, that is, when other explanatory variables remain unchanged (random $\beta_1, \beta_2,$

β_3 In the case of perturbation term), the explanatory variables "gross domestic product", "number of graduates" and "number of students studying abroad" combined have an impact on "number of graduate students".

3.3. Econometric Test

(1) multicollinearity test

The data in the multiple regression model made from the above content can be obtained, the number of graduates increased by 10,000 yuan, and the number of postgraduate entrance examinations decreased by 0.4245 million yuan. In theory, the number of postgraduate entrance examinations and the number of graduates should be positively correlated, but the correlation between the two in the analysis results is obviously inconsistent, so the preliminary judgment model may have multicollinearity. Since the results of the number of graduates are not consistent with theoretical analysis and empirical judgments, a multicollinearity analysis will be made later.

When the variance inflation factor is greater than or equal to 10, it indicates that there is serious multicollinearity between the explanatory variables and the explained variables. First judge whether there is multicollinearity by the simple correlation coefficient, and then check whether the variance inflation factor is greater than or equal to 10. If there is multicollinearity, use the stepwise regression method to correct it.

① Simple Correlation Coefficient Method

Continue the previous step, enter cor x1 x2 x3 in the task bar, and get the following results:

G Group: UNTITLED Workfile: UNTITLED::Untitled\									
View	Proc	Object	Print	Name	Freeze	Sample	Sheet	Stats	Spec
Correlation									
		X1	X2	X3					
X1		1.000000	0.988898	0.995447					
X2		0.988898	1.000000	0.996161					
X3		0.995447	0.996161	1.000000					

Figure 6. Simple correlation coefficient method

Because the correlation coefficients of the two variables are greater than 0.8 and almost approach 1, there is serious multicollinearity, and the variance inflation factor method is used to continue the test.

② variance inflation factor method

In Eviews, click View / Coefficient Diagnostics/Variance Inflation Factors directly in the big regression results, and press Enter to get the following results:

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	106452.9	5152.014	NA
X1	5.88E-08	1241.159	123.2178
X2	0.442391	10964.48	146.1116
X3	28.16288	3068.823	355.0585

Figure 7. VIF menu calculation result

As shown in the figure above, it can be obtained that the variance inflation factors of the explanatory variables x 1, x2, and x3 are 1 23.2 178, 146.1116, 355.0585, respectively . Experience shows that when the variance inflation factor is greater than or equal to 10 , it means that there is a serious multiplicity of common factors among the explanatory variables. If it is linear, the estimated parameters are all wrong, so we need to correct for multicollinearity.

③ Correction for multicollinearity

Following the above content, when there is severe multicollinearity between the explanatory variables, wrong information will be displayed in the regression model window of Eviews , so the above model must be corrected for multicollinearity. In order to correct the multicollinearity, you can directly use the simple menu method Quick / E stimate E quation, and choose to meet the requirements of the stepwise regression method. The final correction result is as follows:

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
C	22.74057	17.62181	1.290479	0.2291
X1	0.000716	0.000221	3.231940	0.0103
X3	-6.604423	2.855660	-2.312749	0.0460

R-squared	0.917793	Mean dependent var	176.7333
Adjusted R-squared	0.899525	S.D. dependent var	48.01330
S.E. of regression	15.21913	Akaike info criterion	8.495301
Sum squared resid	2084.598	Schwarz criterion	8.616528
Log likelihood	-47.97181	Hannan-Quinn criter.	8.450419
F-statistic	50.24016	Durbin-Watson stat	1.097520
Prob(F-statistic)	0.000013		

Selection Summary

Figure 8. Stepwise regression results

As can be seen from the above figure, after the multicollinearity is corrected by the stepwise regression method, the new model is:

$$\hat{y} = 22.7406 + 0.0007x_1 - 6.6044x_3$$

After modifying the multicollinearity, the number of x_2 graduates is eliminated, and the remaining variables do not have multicollinearity, the coefficient of determination is, the modified coefficient of determination is greater than 0.8, and both are close to 1, It shows that the degree of fitting is relatively good, and it is also in line with life experience and economic theory, and the positive and negative signs of the coefficients before the explanatory variables x_1 and x_3 are also accurate, indicating that the new model is consistent with the actual model. The p of the T test in the figure are 0.0103 and 0.0460 respectively, both of which are less than 0.05, indicating that the T test is also passed. In the same way, it can be clearly seen in the figure that the F test still passes, indicating that the new model has no problems at present and the fitting effect is also very good, which indicates that the new model has no problems and can be tested as follows.

(2) Heteroskedasticity test

Continuing the above, because in real research, economic activities are more complicated, and because of the existence of heteroscedasticity, it means that factors that cannot be observed in the model may have a serious impact on explanatory variables, such as the book says "Errors in model specification, variations in measurement errors, and differences in population units between cross-sectional data" can all lead to heteroscedasticity. Therefore, it is necessary to test the model for heteroscedasticity.

In order to prevent the existence of heteroscedasticity due to the excessive difference of x , first use the white test menu mode to test, that is, do a large regression through the new data, select View/ Residual Diagnostic/ Heteroskedasticity Tests on the window page, and see nR^2 the corresponding p Whether it is less than or equal to 0.05, and then judge whether there is heteroscedasticity. The result is as follows:

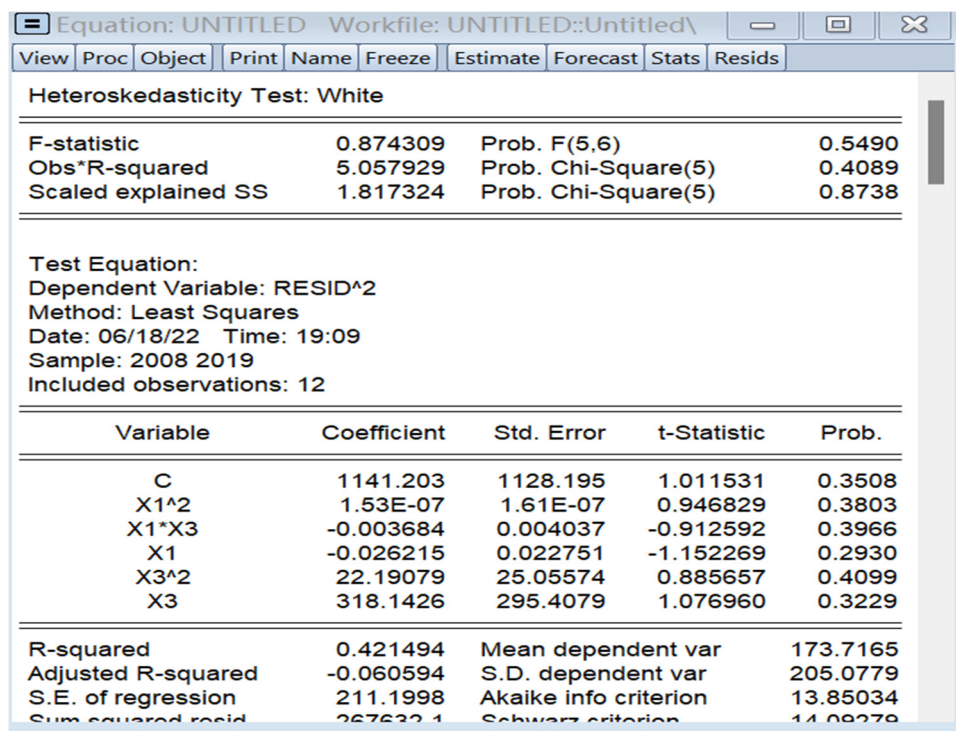


Figure 9. The result of the white menu method

Since the nR^2 corresponding p is greater than 0.05, the null hypothesis is accepted. Generally, the null hypothesis is that there is no heteroscedasticity, so there is no heteroscedasticity in this model. No correction for heteroscedasticity is required.

① Autocorrelation test

First, the DW value in the model window should be used to test whether the model has first-order autocorrelation. As shown in Figure 7 above, the DW value is found to be 1.0975. Since $n = 12, k = 2$, under the condition of significance level $\alpha = 0.05, D_l = 0.812, D_u = 1.579$. According to the DW test decision rule in the book, when $D_l \leq DW \leq D_u$, it is impossible to judge whether there is autocorrelation. Next, it is necessary to further confirm whether the model has autocorrelation.

First, do a large regression through the new model, and test the partial correlation coefficient to see if there is autocorrelation, and then click View/ Residual Diagnostics / Correlogram - Q - Statistics on the interface after the large regression to pass the results. analyze. The results are as follows:

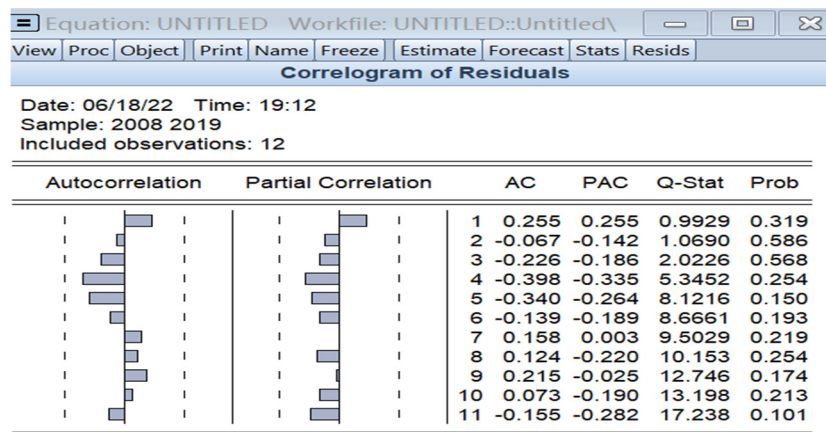


Figure 10. Partial correlation coefficient menu method settlement

by Partial Correlation that the model had no autocorrelation, and no autocorrelation correction was required.

After the econometric test and the economic theory test, it is considered that the data of x_2 is unreasonable, so because the explanatory variable of x_2 is excluded, the statistical test will be started after three tests and corrections. The resulting new model is:

$$\hat{y} = 22.7406 + 0.0007x_1 - 6.6044x_3$$

The conclusion shows that when the GDP increases by 100 million yuan, the number of postgraduate entrance examinations increases by 0.0007 million; when the number of students studying abroad increases by 10,000 yuan, the number of postgraduate entrance examinations decreases by 660.44 million.

4. Conclusion

With the development of the economy, the requirements for academic qualifications will gradually increase. When the GDP increases, the number of postgraduate entrance

examinations increases steadily. Economic growth brings technological progress, and technological progress increases the demand for labor force. It's just that some can't meet the needs of enterprises, and too little combination of practice and theory at the undergraduate stage leads to most undergraduates getting employed or unemployed. Therefore, in order to become a good employee, it is very necessary to improve one's own knowledge reserve.

With the improvement of people's living standards, studying abroad has become commonplace, especially 9 85 , 211 college students have become the main force of studying abroad. Under the condition of a certain number of students, when the number of international students increases, the number of postgraduate entrance examinations will be reasonable decrease.

When college students do not go to the labor market to know the average salary level during their school days, they will form a high-spirited mentality. If they see that the lower salary and salary cannot meet their needs, they will choose to further study. In addition, the current price level and the cost of living are getting higher and higher. The wages earned by undergraduates cannot meet people's needs, so the increase in the number of postgraduate entrance examinations has accelerated. Therefore, taking into account that if you want to change the first degree, you should choose the postgraduate entrance examination as much as possible according to your own development. Now the employment situation is so severe, you can only choose if you have more value than others.

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