Analysis and Prediction of the Final Grade of Securities and Futures Based on SPSS

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ABSTRACT

Securities and futures is a general course for undergraduates in the university, which plays an important role in cultivating students' ability to analyze and solve problems. It not only helps teachers to know and master the distribution of students' performance accurately, but also helps teachers to improve the quality of teaching. SPSS is an analytical software used to carry out statistical analysis. Using SPSS and descriptive analysis method, the paper makes a reasonable evaluation of the final grade based on the data of the final grade of the students' securities and futures. The paper gets the correlation coefficient value of students' final grade and usual performance, judges the correlation between them, builds regression equation by using correlation analysis and regression analysis, and then make a reasonable prediction of students' final grade in the future.

KEYWORDS: SPSS, final grade, regression analysis, prediction

I. INTRODUCTION

Securities and futures is a general course for undergraduates. It can not only cultivate students' ability to put forward, analyze and solve problems, but also cultivate students' ability of logical thinking and prediction reasoning. The teachers can understand the students' learning state and the degree of mastering the course knowledge, also can make the teachers have the will and motivation to improve the quality of teaching continuously, lay a solid foundation for the follow-up teaching work, through the analysis of the students' final grade. Most teachers adopt the method of performance analysis, which is semi-manual calculation by Excel. The analysis process is time-consuming and laborious. In order to achieve the purpose of high data processing and efficient analysis, Statistical Package for Social Sciences (named as SPSS) is an effective tool for processing hundreds of performance data. The package is particularly useful for students in psychology, sociology, and other behavioral sciences. Data analysis generally begins with the calculation of a number of summary statistics such as the mean, median, standard deviation, etc., and by creating informative graphical displays of the data such as histograms.

II. STATISTICAL ANALYSIS OF BASIC DATA

This study aims at the final grade of securities and futures based on SPSS, to help teachers more comprehensive understanding of students' learning state, so as to improve the quality of teaching, descriptive statistical analysis is as follows.

A. The frequency of final grade

Data statistics are made on the final grade of 58 students in securities and futures of the university. SPSS is used to analyze the final grade. The histogram of final grade is shown in figure 1.The final grade of securities and futures is approximately normal distribution, and the standard deviation is 2.639, which reflects that the teacher's evaluation of students' performance is reasonable.
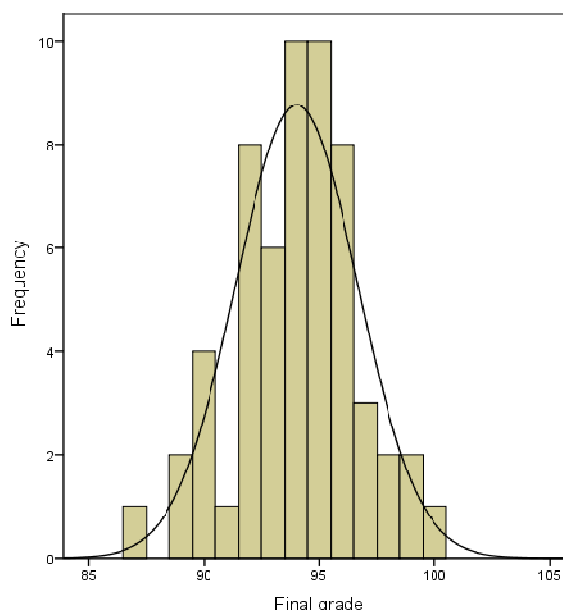

Fig.1 Histogram

B. The mean value and standard deviation of final grade

The data statistics of the final grade of securities and futures are carried out, and descriptive statistics such as minimum value, maximum value, mean value and standard deviation are constructed. SPSS is used for statistical analysis, as shown in table. The results show that the total number of samples is 58, the highest score is 100,the lowest score is 87,the mean value of samples is 94.02,and the standard deviation of samples is 2.639,which indicates that there is a certain deviation among samples.

TABLE I DESCRIPTION STATISTICS

	N	Minimum value	Maximum value	Mean value	Standard deviation
Final Grade	58	87	100	94.02	2.639
Valid n (list status)	58				

III. REGRESSION ANALYSIS OF PERFORMANCE

There are many factors that affect the final grade of students, such as students' usual performance, teaching quality of teachers, students' ability to learn knowledge, etc. In order to study the influence of students' usual performance on the final grade,carry out regression analysis of the final grade based on the usual performance.

A. **Correlation analysis**

As can be seen from table, the correlation coefficient between the usual performance and the final grade as two variables is 0.364 at the 0.01 significance level (bilateral), which is between 0 and 1.This indicates that the usual performance and the final grade are positive correlation and weak correlation.

TABLE II CORRELATION

		Usual performance	Final grade
Usual performance	Pearson correlation	1	.364**
	Significance (bilateral)		.005
	N	58	58
Final grade	Pearson correlation	.364**	1
	Significance (bilateral)	.005	
	N	58	58
**. There was a significant correlation at. 01 level (bilateral).			

B. **Regression analysis**

In order to better study the influence of students' usual performance on the final grade, regression analysis was carried out on the two variables of usual performance and final grade. According to table III, the input method is adopted, the independent variable is the usual performance, and the dependent variable is the final grade. We can see from table IV that the correlation coefficient r value between the two variables of the usual performance and the final grade is 0.364, which indicates that the correlation between the two variables is not high. The value of the coefficient R^2 is 0.133,which means that the usual performance can only explain 13.3% of the final grade. In other words, the accuracy of using the usual performance to predict the final grade is only 13.3%, the model is accurate, the regression effect is significant, and the model fitting degree is relatively high. Table V shows the statistical test results of the model, and the analysis of variance is used. It is known that F= 8.555, P = 0.005 < 0.05.So the regression model is statistically significant, that is to say, the regression equation is effective. It can be seen that there is a linear correlation between the usual performance and the final grade.

Table VI shows the coefficients of the constructed model. The coefficients of the regression equation are estimated. The estimated value of constant a is 82.819,and the estimated value of regression coefficient b_1 is 0.244.A linear regression model of one variable can be obtained. The model equation is as follows.

$$\hat{Y} = 82.819 + 0.244 \times X$$

Where, X is the usual performance and $\hat{Y}$ is the predicted final grade.The final grade will be increased by 0.244 points for every 1 point increase in usual performance.

TABLE III INPUT VARIABLES REMOVED VARIABLES

Model	Input variable	Removed variables	Method
1	usual performance [a]		input
a. All requested variables have been entered.			
b. Dependent variable: final grade			

TABLE IV MODEL SUMMARY

Model	R	R^2	Adjust R^2	Error of standard estimation	Durbin-Watson
1	.364[a]	.133	.117	2.480	1.876
a. Forecast variable: (constant), usual performance.					
b. Dependent variable: final grade					

TABLE V ANOVA

	Model	Sum of squares	df	mean square	F	Sig.
1	regression	52.609	1	52.609	8.555	.005[a]
	residual	344.374	56	6.150		
	Total	396.983	57			
a. Forecast variable: (constant), usual performance. b. Dependent variable: final grade					

TABLE VI COEFFICIENT

	Model	Non standardized coefficient		Standard coefficient	t	Sig
		B	Standard error	Trial version		
1	(constant)	82.819	3.843		21.553	.000
	usual performance	.244	.083	.364	2.925	.005
	a. Dependent variable: final grade					

IV. THE EVALUATION AND PREDICTION OF FINAL GRADE

Descriptive analysis of the final grade of securities and futures shows that the final grade of students is approximately normal distribution.The mean value of 58 students is 94.02 and the standard deviation is 2.639, which shows that the distribution of students' performance is reasonable and the deviation is relatively small. Taking the usual performance and final grade are as two variables, the correlation coefficient of the two variables is 0.364,which is not high. Taking the final grade and the usual performance as the dependent and independent variables, the regression analysis of the two variables shows that there is a linear correlation between them, the regression effect is significant, and the fitting degree of the model is relatively high.

V. CONCLUSION

The analysis of final grade is an organic part of education. The analysis, measurement, evaluation and prediction of final grade should be the necessary ability of every teacher. Combined with specific data from descriptive analysis, correlation analysis and regression analysis, SPSS was used to analyze the final grade. Teachers can not only better understand the current state of students' learning, but also predict the unknown grades through analyzing the data of final grades. The prediction results are reasonable and reliable.

Therefore, the coefficient of the regression equation is estimated and the linear regression equation of one variable is obtained. The regression equation can be used to predict the final grade of the students.

REFERENCES

[1] Sanaa Rasheed Muhesin, Abbas Fadhil Salih. A Statistical Analysis of Organizational Performance and its Impact on Income Levels: an Exploratory Study by the Al-Nahrain University in the Diagnosis of Infertility and Assisted Reproductive Technology. 2020, 2(3)

[2] Herber R, Kaiser A, Grählert X, Range U, Raiskup F, Pillunat L E, Spörl E. Statistical analysis of correlated measurement data in ophthalmology : Tutorial for the application of the linear mixed model in SPSS and R using corneal biomechanical parameters[J]. Der Ophthalmologe: Zeitschrift der Deutschen Ophthalmologischen Gesellschaft,2020,117(1).

[3] Hongchao Wu, Shaoping Qiu, Larry M. Dooley, et al. The Relationship between Challenge and Hindrance Stressors and Emotional Exhaustion: The Moderating Role of Perceived Servant Leadership. 2019, 17(1)

[4] Aung Cho, Khin Khin Lay. Applied SPSS for Business and Marketing. 2019, 3(4)