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Study of Student's Financial Satisfaction using Path Analysis Method

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Abstract: This research aims to measure the extent of the influence of factors affecting financial satisfaction, both directly and indirectly, among undergraduate students majoring in Mathematics and Natural Sciences (S1 FMIPA) at Syiah Kuala University. The factors investigated in the study are limited to three, namely financial attitudes (X_1), financial knowledge (X_2), financial management behavior (Y_1), and financial satisfaction (Y_2). The research sample consists of 100 respondents, who are undergraduate students in S1 FMIPA at Syiah Kuala University, and data is collected through a questionnaire. This study employs probability sampling with proportionate stratified random sampling as the sampling technique. Statistical analysis using path analysis is used to determine the influence both directly and indirectly. The results of the path analysis reveal that the variable that has a direct effect on financial satisfaction is financial management behavior, with an influence of 38%. Meanwhile, financial attitudes and financial knowledge have an indirect influence through financial management behavior, with respective influences of 19.4% and 13.1%. Thus, the total influence obtained for each variable is 38%, 47.5%, and 70.4%.

Keywords: Direct Influence, Financial Satisfaction, Indirect Influence, Path Analysis, Structural equation.

Introduction

The development of the financial world in the increasingly complex modern era has provided many options for people to act in achieving the goal of financial satisfaction. To achieve financial satisfaction requires individual financial behavior that leads to good and responsible behavior and an understanding of the finances. Understanding of finance or also called financial literacy is a level of knowledge, skills, and beliefs that influence attitudes and behaviors to improve the quality of decision-making and financial management for welfare [1]. Financial satisfaction is an important measure for individuals in obtaining happiness in life, therefore research on financial satisfaction is important to study considering that many related studies are rarely found and the discussion of this is not too familiar when compared to other field satisfaction indicators such as customer satisfaction and job satisfaction [2].

The achievement of financial satisfaction for students shows that students' financial needs have been fully met so they do not have financial worries. So that the problems of looking for life are less felt so that students will be more focused on college achievements [3]. Financial satisfaction can be measured through a person's perspective on the satisfaction of the income received, the ability to overcome financial problems, the ability to meet basic needs, the level of debt owned, the amount of savings, the availability of money for future needs, and life goals [4,5]. The financial satisfaction indicator according to [6,7] is divided into satisfaction with the amount of savings balance owned, monthly spending ability, and ability to buy goods. Financial behavior is defined as human behavior that is relevant to financial management, financial behavior includes cash, credit, and saving behavior [8]. Individuals need knowledge of finance to make decisions that will improve quality of life now and in the future [9,10]. The financial attitude that a person has will help the individual in determining how to behave in financial terms,

Indonesian Journal of Applied Mathematics, vol. 5, no. 1 (2025) | 1

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either in terms of financial management, personal financial budgeting, or how individual decisions regarding the form of investment to be taken [11]. Every individual who always applies financial attitudes in his life will make it easier for these individuals to determine attitudes and behave in financial matters. Herdjiono et al. states that there is a relationship between financial attitudes and the level of financial problems [12].

Several studies have been conducted related to factors that affect financial satisfaction, including research from Arifin on financial attitude and financial satisfaction based on partial least square method [13]. In the study, it was found that financial attitude has a significant influence on financial satisfaction. Another study, Wijaya and Sugara shows that the factors that affect financial satisfaction are income, financial attitude and financial management behavior using regression method [14]. Natawiguna and Pamungkas use variables of financial knowledge, financial attitude and financial risk tolerance as factors that affect financial satisfaction using structural equation modeling [15]. In the study, it is known that financial knowledge and financial attitude both an influence on financial satisfaction show variables, but financial risk has no influence on financial satisfaction.

Multivariate statistical analysis is a research method involving two or more research variables. By using this analysis technique, it can be analyzed the influence of several variables on other variables at the same time. Path analysis is a multivariate statistical technique used to examine relationships between causal variables. The analytical technique developed by Sewal Wright in 1934 is closely related to multiple regression analysis [16]. Simple regression analysis is only able to test the effect of the independent variable on the directly bound variable. While path analysis is able to test causal relationships directly and indirectly through intervening variables. In path analysis, independent variables are known as exogenous variables and for variables are called endogenous dependent variables. A path analysis with a minimum of 3 variables, then one of the variables will act as an intervening variable in the analysis model. This intervening variable can play a multiple role, in the sense that it can act as an exogenous variable and can act as endogenous [17].

This study aims to analyze the direct and indirect effects of factors that affect financial satisfaction in S1 FMIPA students of Syiah Kuala University. The study began by testing and obtaining the form of structural equations from factors that affect the financial satisfaction of undergraduate students of Faculty of Mathematics and Natural Sciences, Syiah Kuala University.

Method

2.1 Population and Sample

The population in this study consists of 2,116 active undergraduate students enrolled in the even semester of the 2021/2022 academic year in the Faculty of Mathematics and Natural Sciences (FMIPA) at Universitas Syiah Kuala, based on data from the university's student portal. The sample size comprises 100 respondents, selected using the proportionate stratified random sampling technique, type of probability sampling. а Proportionate stratified random sampling is used to ensure that each subgroup in the population, such programs or academic as study years, is proportionally represented in the sample. This method improves the accuracy of research results reducing bias and producing bv а more representative sample.

2.2 Data Collection Techniques

In this study, the data collection technique employed is the questionnaire. The questionnaire serves as a tool to gather information from respondents who are undergraduate students at the Faculty of Mathematics and Natural Sciences (FMIPA), Syiah Kuala University. The respondents, numbering 100 individuals and forming part of the research sample, are requested to complete the questionnaire as a means of obtaining the necessary data. By utilizing the questionnaire, researchers can systematically and efficiently collect data on the variables under investigation, such as financial attitudes, financial knowledge, financial management behavior, and financial satisfaction. This technique facilitates data analysis and enables researchers to comprehend the patterns of relationships among variables within the context of this study.

The scale utilized in this study is the Likert scale. The Likert scale is employed to measure respondents' opinions or attitudes towards various statements or items in the questionnaire. Respondents are asked to indicate their level of agreement or disagreement with each statement, typically using a range of options such as strongly disagree, disagree, neutral, agree, and strongly agree. This scale provides а quantitative measurement of subjective experiences or opinions and allows for the assessment of the intensity of attitudes or perceptions related to the variables under investigation.

2.3 Operational Variables

In the research context, operational variables are the measurable or observable versions of conceptual variables. Conceptual variables are general ideas or concepts that researchers aim to measure or analyze in a study. To measure conceptual variables, there needs to be an operational definition that specifically outlines how the variable will be measured or observed. In this study, three variables are differentiated to endogenous, intervening, and exogenous variables

Financial satisfaction is the endogenous variable in the research, represented by the symbol Y₂. Financial management behavior is denoted by the symbol Y₁. Financial management behavior acts as an intermediary variable between financial attitudes and financial knowledge toward financial satisfaction. Financial attitudes and financial knowledge are designated as exogenous variables in this study. Both variables are expected to have a significant influence on the endogenous variable, which is financial satisfaction. Financial satisfaction. Financial satisfaction are expected to have a significant influence on the endogenous variable, which is financial satisfaction. Financial attitudes are symbolized by X₁, and financial knowledge is symbolized by X₂.

2.4 Data Analysis Method

Path analysis, a statistical analysis method, is employed as the data analysis method in this research. Path analysis is an extension of regression analysis used to analyze the cause-and-effect relationships between variables, both directly and indirectly. Path analysis is also known as regression

Copyright © 2025 – Indonesian Journal of Applied Mathematics Published by: Lembaga Penelitian dan Pengabdian Masyarakat (LPPM) Institut Teknologi Sumatera, Lampung Selatan, Indonesia analysis with intervening variables. The following are the steps involved in conducting path analysis:

1. Designing Path Diagram

The first step in conducting path analysis is to create a path diagram. The path diagram model is constructed based on the variables studied in the research, which in this case include financial attitudes (X_1), financial knowledge (X_2), financial management behavior (Y_1), and financial satisfaction (Y_2).

2. Calculating Structural Equations

The next step after forming the path diagram is to create corresponding structural equations.

3. Hypothesis Testing

Hypothesis testing is carried out to examine the influence between exogenous variables and their endogenous variables, both partially and simultaneously. The following hypotheses are formulated for the two equations in the path analysis:

- A. H0: Financial attitudes do not influence financial management behavior
 H1: Financial attitudes influence financial management behavior
- B. H0: Financial knowledge does not influence financial management behavior
 H2: Financial knowledge influences financial management behavior
- C. *H*0: Financial attitudes and financial knowledge influence financial do not management behavior Financial H3: attitudes and financial knowledge influence financial management behavior.
- D. H0: Financial attitudes do not influence financial satisfaction
 H4: Financial attitudes influence financial satisfaction
- E. H0: Financial knowledge does not influence financial satisfactionH5: Financial knowledge influences financial satisfaction
- F. H0: Financial management behavior does not influence financial satisfaction
 H6: Financial management behavior influences financial satisfaction

 G. H0: Financial attitudes, financial knowledge, and financial management behavior do not influence financial satisfaction
 H7 Financial attitudes, financial knowledge, and financial management behavior influence financial satisfaction.

4. Direct and Indirect Effects

In the final analysis stage, the process is to determine the magnitude of direct and indirect effects of each variable factor. Direct influence is the influence of exogenous variables on endogenous variables without going through intervening variables. The mathematical equation to obtain the value of direct influence is as follows:

$$DE = \rho_{x_u y_i} \tag{1}$$

The influence that occurs if an exogenous variable affects an endogenous variable through an intervening variable is called an indirect influence. The mathematical equation to obtain the value of indirect influence is as follows:

$$IE = \rho_{x_u y_i} \, \rho_{x_i y_i} \tag{2}$$

The sum of the direct and indirect influences constitutes the total influence. The mathematical equation to obtain the value of direct influence is Total Influence = DE + IE. All equations have parameter descriptions ρ as a path value symbol, and the u, i, and j index that expand in [1,k] where k is the number of paths.

Results And Discussion

3.1. Testing

The validity test is used to measure the validity or validity of a questionnaire. The results of the validity test can be seen in Table 1, which shows that all variables are valid by marking each indicator as having a value $R_{cal} > R_{table}$ where the value R_{table} indicated by the value 0.197.

Table 1. Validity Test

No	Variable	Sym bol	R _{table}	R _{cal}	Information Result
1	Financial	Fa1	0.197	0.674	Valid
2	Attitude	Fa2	0.197	0.382	Valid

No	Variable	Sym bol	R _{table}	R _{cal}	Information Result
3		Fa3	0.197	0.634	Valid
4		Fa4	0.197	0.649	Valid
5		Fa5	0.197	0.641	Valid
6		Fa6	0.197	0.441	Valid
7		Fa7	0.197	0.323	Valid
8		Fk1	0.197	0.624	Valid
9		Fk2	0.197	0.584	Valid
10		Fk3	0.197	0.683	Valid
11	Financial Knowledge	Fk4	0.197	0.572	Valid
12	Knowledge	Fk5	0.197	0.493	Valid
13		Fk6	0.197	0.592	Valid
14		Fk7	0.197	0.635	Valid
15		Fmb	0.197	0.679	Valid
16		Fmb 2	0.197	0.565	Valid
17		Fmb	0.197	0.743	Valid
18	Managemen t behavior	3 Fmb 4	0.197	0.473	Valid
19	Finance	Fmb	0.197	0.741	Valid
20		5 Fmb	0.197	0.750	Valid
21		6 Fmb 7	0.197	0.726	Valid
22		Fs1	0.197	0.734	Valid
23		Fs1	0.197	0.734	Valid
24	Financial	Fs3	0.197	0.888	Valid
25	Satisfaction	Fs4	0.197	0.840	Valid
26		Fs5	0.197	0.778	Valid

Data source: Processed data

The validity test results show that all indicators in the questionnaire are considered valid because the R_{cal} value is greater than R_{table} (0.197). This indicates that the research instrument effectively measures the variables being studied. Therefore, the questionnaire can be used as an accurate and reliable data collection tool.

Reliability testing using Cronbach's Alpha values, where a Cronbach Alpha value of 0.6 is considered reliable. The test results in Table 2

4 | Indonesian Journal of Applied Mathematics, vol. 5, no. 1 (2025) Study of Student's Financial Satisfaction using Path Analysis Method

indicate that each research variable has a Cronbach Alpha value > 0.6, indicating that the data can be considered reliable.

Table 2. Reliability Test

No	Variable	Cronbach Alpha	Information Result
1	Financial Attitude	0.61	Reliable
2	Financial Knowledge	0.68	Reliable
3	Management Behavior Finance	0.80	Reliable
4	Financial Satisfaction	0.88	Reliable

Data source: Processed data

The reliability test using Cronbach's Alpha shows that all research variables have values greater than 0.6, indicating that the data is reliable. This suggests that the questionnaire used in the study provides consistent and dependable results. Therefore, the data can be considered appropriate for further analysis.

Testing to determine whether a dataset is normal or not using the Kolmogorov-Smirnov table. The results of the normality test for the study can be seen in Figure 1, where the criterion value in the Kolmogorov-Smirnov is greater than 0.05, specifically 0.453 > 0.05, indicating that the existing data is evenly distributed.

		Unstandardiz ed Residual
N		100
Normal Parameters ^a	Mean	.0000000
	Std. Deviation	4.08872365
Most Extreme Differences	Absolute	.045
	Positive	.045
	Negative	030
Kolmogorov-Smirnov Z		.453
Asymp. Sig. (2-tailed)		.986

a. Test distribution is Normal.

	(a)									
		Unstandardized Coefficients		Standardized Coefficients	Collinearity Statistics					
Model		В	Std. Error	Beta	Tolerance	VIF				
1	(Constant)	1.156	4.339							
	Sikap keuangan	.142	.166	.102	.606	1.651				
	<u>Pengetahuan</u> keuangan	077	.139	060	.731	1.368				
L	Perilaku pengelolaan keuangan	.412	.141	.380	.502	1.992				

(b)

Figure 1. (a) Normality Test with Kolmogorov-Smirnov, (b) Multicollinearity Test. Data source: SPSS (processed, 2024).

Copyright © 2025 – Indonesian Journal of Applied Mathematics Published by: Lembaga Penelitian dan Pengabdian Masyarakat (LPPM) Institut Teknologi Sumatera, Lampung Selatan, Indonesia The next test is the multicollinearity test, which is determined by examining two factors: the tolerance value and the VIF (Variance Inflation Factor) value of the data. The results of the multicollinearity test in Figure 1 indicate that the tolerance value is > 0.1 and VIF is < 10, indicating the absence of multicollinearity. Heteroskedasticity testing is conducted by examining the patterns formed in a scatterplot. Based on the results of the heteroskedasticity test in Figure 2, it is observed that the data points are scattered randomly, indicating no signs of heteroskedasticity.



Data source: SPSS (processed, 2024).

The path analysis method is used to measure relationship patterns based on the magnitude of the influence of exogenous variables on endogenous variables, both directly and indirectly. In this study, path analysis with two paths is employed, as shown in Figure 2, resulting in the formation of two structural equations.



where: X_1 = Financial attitude variables,

- X_2 = Financial Knowledge Variables,
- Y_1 = Financial Management Behavior Variables,
- Y_2 = Financial satisfaction variables,
- $\rho_{X_1Y_1}$ = Coefficient of the path of the financial attitude variable to the behavior variable of financial management,
- $\rho_{X_2Y_1}$ = Coefficient of financial knowledge variable path to financial management behavior variable,
- $\rho_{X_1Y_2}$ = Variable path coefficient of financial attitude to financial satisfaction variable,
- $\rho_{X_2Y_2}$ = Coefficient of path of financial knowledge variable to financial satisfaction variable,
- $\rho_{Y_1Y_2}$ = Coefficient of the path of the financial management behavior variable to the financial satisfaction variable,
- $\varepsilon_{1,2}$ = Interference or *residue*.

From the diagram above, two structural equations are obtained as follows:

Structural equation 1:

$$Y_1 = \rho_{X_1Y_1} X_1 + \rho_{X_2Y_1} X_2 + \varepsilon_1$$
(3)

Structural equation 2:

$$Y_2 = \rho_{X_1 Y_2} X_1 + \rho_{X_2 Y_2} X_2 + \rho_{Y_1 Y_2} Y_1 + \varepsilon_2$$
(4)

The calculation results can be seen in Tables 3 and 4, where equation (3) is described in Table 3 and equation (4) is described in Table 4.

The causal relationship between variables in (3), consisting of two exogenous variables and one endogenous variable, is shown in Figure 4 below:



Figure 4. Path Diagram of Structural Equation Model 1.

The structural equation formed through the path diagram above is as follows. The steps to obtain Structural Equation Model 1 were carried out using SPSS software. The summary of the calculation results is as follows:

		Coef	ficientsª			
		Unstand	lardized	Sta	ndardize	ed
	Madal	Coefficients		Coefficients		
Model		В	Std.	Beta	t	Sig
		D	Error	Deta	ť	016.
1	(Constant)	-3.554	3.094		-1.149	.253
	X2	.408	.091	.344	4.489	.000
	X_1	.656	.099	.510	6.659	.000

Table 3. Calculation of Path Coefficients of Structural Equation 1

^a Dependent Variable: Y₁

Based on Table 3 above, it is known that the path coefficients for structural equation 1 have two coefficient values. It is known that the coefficient of the first path is the path (X₁) \rightarrow (Y₁) or the variable path of financial attitudes towards financial management behavior variables with a coefficient of 0.510. Furthermore, the second path is the path (X₂) \rightarrow (Y₁) or the financial knowledge variable path to financial management behavior variables with a coefficient of 0.344. For the value of ε_1 obtained by calculating the error formula, with an R Square value of 0.498 then the result $\varepsilon_1 = \sqrt{(1 - 0.498)} = 0.708$. So, the current structural equation 1 is Y₁ = 0.510 X₁+0.344 X₂+0.708.

The value of 0.708 indicates that the variance of variables not examined in Structural Equation Model 1 has an influence on financial management behavior of 0.708 or 70.8%. This relatively high error value implies that, in addition to financial attitudes and financial knowledge, there are other variables that also influence financial management behavior.

The causal relationship between variables in Structural 2, consisting of exogenous variables X_1 , X_2 , and Y_1 , as well as the endogenous variable Y_2 , is shown in the following figure.



Figure 5. Path Diagram of Structural Equation Model 2.

6 | Indonesian Journal of Applied Mathematics, vol. 5, no. 1 (2025) Study of Student's Financial Satisfaction using Path Analysis Method The steps to obtain Structural Equation Model 2 also were carried out using SPSS software.

The summary of the calculation results is as follows:

 Table 4. Calculation of Path Coefficients of Structural Equation 2

Coefficients ^a							
		Unstand	ardized	Standardized			
26.11		Coeffi	Coefficients		Coefficients		
	Model	В	Std. Error	Beta	t	Sig.	
2	(Constant)	1.156	4.339		.266	.791	
	X2	077	.139	060	550	.583	
	X1	.142	.166	.102	.856	.394	
	Y_1	.412	.141	.380	2.910	.004	

^a Dependent Variable: Y₂

Based on Table 4, it is known that the path coefficients for structural equation 2 have two coefficient values. It is known that the coefficient of the first path is the path $(X_1) \rightarrow (Y_2)$ or the variable path of financial attitudes towards financial satisfaction variables with a coefficient of 0.102. Furthermore, the second path is the path $(X_2) \rightarrow (Y_2)$ or the financial knowledge variable path to financial satisfaction variables with a coefficient of -0.060. The third coefficient value is for the path $(Y_1) \rightarrow (Y_2)$ or the variable path of financial management behavior to the financial satisfaction variable with a coefficient of 0.380. For the value of ε_2 obtained by calculating the error formula, with an R Square value of 0.179 then the result $\epsilon_{2} = \sqrt{(1 - 0.179)} = 0.906$. So, the current structural equation 2 is $Y_2 = 0.102 X_1 - 0.060 X_2 + 0.380 Y_1 + 0.906$.

The value of 0.906 indicates that the variance of variables not examined in Structural Equation Model 2 has an influence on satisfaction of 0.906 or 90.6%. This relatively high error value implies that, in addition to financial attitudes, financial knowledge, and financial management behavior, there are other variables that also influence financial management behavior.

3.2. Hypothesis Analysis and Pathway Influence The hypothesis used in research is a partial and simultaneous hypothesis test. The results of hypothesis testing obtained in both structural equations can be seen in Table 5.

Based on Table 5 above, it is known that in structural equation 1 the accepted hypothesis is H₁ in hypothesis A, H₂ in hypothesis B, and H₃ in hypothesis C or in other words all hypotheses in the equation are accepted. As for hypotheses A and B, testing is carried out with t-tests, while hypothesis C uses F-testing. It can be seen that hypotheses A and B show the H₀ reject testing criteria because of the t_{cal} \geq t_{table} value, as well as the hypothesis C also shows the H₀ rejection testing criteria because F_{cal} \geq F_{table}. As for structural equation 2, different results are obtained from structural equation 1, namely hypotheses D and E give the results of accepting H₀.

Table 5. Hypothesis Testing

Hyp	Types of	t-Te	t-Test		est	Information	
sis	SEM	t _{cal}	t _{table}	F _{cal}	F _{table}	Result	
А		6.659	1.98	-	-	H_1 accepted	
В	Structural equation 1	4.489	4	-	-	H_2 accepted	
С		-	-	48.13 4	3.09	H_3 accepted	
D		-0.550	_	-	-	H_4 rejected	
Е	Structural	0.856	1.98	-	-	H_5 rejected	
F	equation 2	2.910	- 5	-	-	H_6 accepted	
G	-	-	-	6.980	2.70	H_7 accepted	

Data source: Processed data

Based on the Table 5 above, it is known that in Structural Equation 1, the accepted hypotheses are H_1 for Hypothesis A, H_2 for Hypothesis B, and H_3 for Hypothesis C. In other words, all hypotheses in the equation are accepted. For Hypotheses A and B, the tests were conducted using the t-test, while Hypothesis C was tested using the F-test. It is evident that for Hypotheses A and B, the test criteria reject H_0 , and similarly, Hypothesis C also shows test criteria that reject H_0 .

In contrast, for Structural Equation 2, the results differ. Hypotheses D and E indicate results that accept H_0 , while Hypotheses F and G yield results similar to those in Structural Equation 1.

The hypothesis testing results provide several key conclusions. For Structural Equation 1, it was

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found that financial attitudes influence financial management behavior, financial knowledge also influences financial management behavior, and both financial attitudes and financial knowledge together have a joint influence on financial management behavior. Meanwhile, for Structural Equation 2, the results show that financial attitudes do not influence financial satisfaction, and financial also does not influence knowledge financial satisfaction. However, financial management behavior does influence financial satisfaction, and collectively, financial attitudes, financial knowledge, and financial management behavior together influence financial satisfaction.

Based on the calculation of the influence of pathways in Equation (1) and Equation (2), direct influence of financial attitudes on financial management behavior was obtained by 0.510, financial knowledge on financial management behavior by 0.344, financial management behavior on financial satisfaction by 0.380, financial attitude on financial satisfaction by 0.102, and financial knowledge on financial satisfaction by -0.060. The indirect influence of financial attitudes on financial satisfaction through financial management behavior and financial knowledge on financial satisfaction through financial management behavior 0.510×0.380=0.194 0.344× was and 0.380=0.131 respectively.

Conclusions

Financial attitude influences financial management behavior, financial knowledge influences financial management behavior, and the combined influence of financial attitude and financial knowledge affects financial management behavior. Financial attitude has no effect on financial satisfaction, financial knowledge has no effect on financial satisfaction, financial management behavior influences financial satisfaction, and the combined impact of financial financial knowledge, attitude, and financial management behavior affects financial satisfaction. The analysis results of the direct effects of each variable can be observed through the path diagram in Figure 3. It is evident that variables with direct effects include financial attitude on financial management behavior at 51%, followed by financial

knowledge on financial management behavior at 34.4%. Furthermore, financial management behavior directly influences financial satisfaction by 38%. There are also indirect effects through financial management behavior. First, financial attitude on financial satisfaction through financial management behavior has an impact of 19.4%, and second, financial knowledge on financial satisfaction through financial management behavior has an impact of 13.1%. Additionally, we can also determine the total influence of variables. The total influence is the sum of both direct and indirect effects. The total influence obtained for each variable in the study is 38%, 47.5%, and 70.4%.

Conflicts of interest

There are no conflicts to declare.

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