

## Conference Paper

# What Determinants of Academic Fraud Behavior? From Fraud Triangle to Fraud Pentagon Perspective

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## Abstract

This study aims to investigate the determinants of academic fraud behavior in the perspective of fraud triangle, fraud diamond, and fraud pentagon. Research method of this study is quantitative study to analyze the determinants of academic fraud behavior. The population of this study is students majoring in economics education of Faculty of Economics Universitas Negeri Semarang (UNNES) who are actively study during the first semester of 2017/2018 academic year. Data is collected using questionnaire. The data is analyzed by descriptive statistic and multiple linear regression. The results show that academic fraud behavior by economics education students of Faculty of Economics (UNNES) is in the low category. Plagiarism and wrong cooperation are the mostly executed of academic fraud behavior than other indicators. This study successfully explains the concepts of fraud triangle, there are pressure, opportunity and rationalization which positively and significantly affect students' academic fraud behavior. Nevertheless, this study fails to verify the concept of fraud diamond and fraud pentagon. Capability, arrogance and external do not affect students' academic fraud behavior. This paper use three concept of fraud to investigate the determinants of academic fraud behavior.

**Keywords:** academic fraud, fraud triangle, fraud diamond, fraud pentagon

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## 1. Introduction

Academic fraud behavior by students and academicians is a fresh phenomenon in education. There is some approach that can be executed to detect determinants of academic fraud behavior by students, such as fraud triangle, fraud diamond, and fraud pentagon concept. All the three frameworks above are developed from fraud phenomena that occurred in the financial sector.

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The concept of fraud triangle was introduced by a criminologist named Cressey (1953), who argued that someone does something (including cheating) due to underlying reason [1]. Next, there was development of diamond fraud concept to understand other factors that influence cheating behavior. Basically, fraud triangle can be developed for prevention and detection of fraudulent behavior by adding an element of capability. Thus, the theory is called fraud diamond, consists of incentive (pressure), opportunity, rationalization, and capability [20]. Opportunity opens the doorway to fraud, and incentive and rationalization can draw the person toward it. However, based on the fraud diamond theory, the person also must have the capability to recognize the open doorway as an opportunity and to take advantage of it [16].

Next, new concept was also developed called fraud pentagon concept. Tugas (2012) proposed fifth element in fraud pentagon concept, which is external regulatory influence. If the effect of external regulation is weak then it is possible to cheat. G Tessa & Harto (2016) explained that new theory that explores more on the trigger factors of fraud is pentagon fraud (Crowe's fraud pentagon theory). Sorunke (2016) offered personality ethics as the fifth dimension in the new pentagon fraud concept. Ethics is considered to minimize the occurrence of fraud.

The concept of fraud triangle has been examined in understanding the behavior of academic cheating. Results show that there is a positive impact of academic pressure, cheating opportunities, and rationalization cheating on student academic fraud behavior [6, 13, 15]. There is also empirical evidence that rationalization has an effect on the student's cheating behavior while transient pressure and opportunity have no significant effect [17]. Apriani, Sujana, & Sulindawati (2017) found that pressure and rationalization have significant effect on students' academic fraud while opportunities were not proven to significantly affect academic fraud behavior.

Some researchers have examined the concept of fraud diamond and found that opportunities, rationalizations and capabilities positively and significantly affect academic cheating behavior, whereas pressure has no effect on academic cheating behavior [12, 14]. The pressure and rationalization are proven to have a significant effect on the students' academic fraud behavior. Meanwhile, the opportunity and capability are not proven to have any influence [11]. Capabilities affects financial fraud behavior, however other dimension of fraud have no impact on financial fraud behavior [10]. In addition, another research concluded different result. They only found positive and significant effect of pressure on academic behavior. Nevertheless, other fraud diamond elements (opportunity, rationalization and capacity) cannot detect academic fraud behavior [22].

Furthermore, previous researchers come into debates on fraud pentagon concept and its effect in fraudulent financial statement [4, 8, 21]. G Tessa & Harto (2016) showed that pressure has positive and significant impact on fraudulent financial statement. In addition, pressure is measured by external pressure and financial stability. However, Yusof (2016) found that only pressure that affects fraudulent financial statement. He proposed fraud diamond model after examining the fraud triangle, fraud diamond, and fraud pentagon in Malaysian companies. Nevertheless, Aprilia (2017) stated that pressure from external party is empirically found not to affect fraudulent financial statement.

Results show that there is a diversification in examining the concept of fraud triangle, fraud diamond, and fraud pentagon. Fraud pentagon [5, 18, 19] to detect academic fraud is rarely found in the previous research. Therefore, this stipulates an opportunity to investigate the issue. This study aims to find empirical evidence related to determinants of academic fraud behavior in the perspective of fraud triangle, fraud diamond, and fraud pentagon. It is expected that this result has comprehensive finding regarding academic fraud behavior phenomenon conducted by university students and its determinants.

## 2. Literature Review

Fraud triangle theory is the first one capable of explaining the elements that cause fraud. This theory is presented by Cressey in 1953. The fraud triangle elements consist of pressure, opportunity, and rationalization [8]. Fraud triangle concept is re-introduced by Wells (1997). Hunton et al. (2004) argue that fraud is a result of the three elements which play their own roles, namely opportunity, incentive or pressure, and rationalization. Later on, he explains that opportunity exists when the internal control is inadequate or when collusion exists, allowing the perpetrators to avoid any control. Incentive or pressure, on the other hand, is what causes someone to commit deception. Pressure can include almost everything including medical bill, expensive lifestyle, and addiction problem [1].

Wolfe & Hermanson (2004) develops a new element in the so-called fraud diamond concept. The said element is capability which is believed to be able to improve the prevention and detection of fraud. According to Wolfe & Hermanson (2004), it is impossible for deception or fraud to occur if no one has the right capability to perpetrate the deception or fraud. The said capability is an individual quality to commit deception, which drives them to find an opportunity and make use of it. Opportunity

becomes their access point to commit a fraud. While pressure and rationalization could attract an individual to commit a fraud, the individual himself/herself should have the appropriate capability to identify an opportunity in order for him/her to launch a fraud tactic appropriately and gain the maximum benefits [8].

An updated theory which covers the fraud triggering factors is fraud pentagon theory (Crowe's fraud pentagon theory). This theory is presented by Crowe Howarth in 2011. Fraud pentagon theory is an extended version of fraud triangle theory presented by Cressey earlier. This theory adds two more elements fraud namely competence and arrogance. The competence described in this fraud pentagon theory bears the same meaning as capability previously explained in fraud diamond theory by Wolfe and Hermanson in 2004. Competence/capability means an employee's capability to ignore internal control, develop a concealment strategy, and control the social situation for his/her own personal benefits. Meanwhile, arrogance is the superiority attitude for having certain rights and the feeling that the company's internal control or policy are not applicable to oneself [8]. Tugas (2012) also proposes fraud pentagon concept by adding external regulatory influence. Fraud will never exist if the regulators can apply the rules ruthlessly so that they will be able to manage the organization's members to comply with them.

### 3. Method

This research is quantitative research that using causality design. This research aims to investigate the determinants of student's academic fraud behavior in the fraud triangle, fraud diamond, and fraud pentagon perspectives.

#### 3.1. Population and samples

The population of this research is students of Economics Education Department of Faculty of Economics UNNES consisting of those majoring in Office Administration Education, Accounting Education and Education of Cooperatives.

#### 3.2. Operational definition of research variable

The dependent variable in this research is academic fraud behavior. And the independent variables in this research are pressure, opportunity, rationalization, capability,

arrogance, and external regulatory influence. These independent variables are developed from the fraud triangle, fraud diamond and fraud pentagon concepts.

### 3.3. Method of data collection

The data in this research are obtained using questionnaire. The questionnaire is developed from several previous studies to capture the research variables more accurately.

### 3.4. Method of data analysis

The data are analyzed using descriptive and inferential statistical analyses. The descriptive statistical analysis is used to describe the research variables in the form of data mean, minimum, maximum, and standard deviation. The inferential statistical analysis used here is multiple regression analysis to test the proposed hypotheses. The hypothesis tests are conducted using the following three regression equations.

$$AFB_1 = a + b_1\text{pressure} + b_2\text{opportunity} + b_3\text{rationalization} \quad (1)$$

$$AFB_2 = a + b_1\text{pressure} + b_2\text{opportunity} + b_3\text{rationalization} + b_4\text{capability} \quad (2)$$

$$AFB_3 = a + b_1\text{pressure} + b_2\text{opportunity} + b_3\text{rationalization} + b_4\text{capability} \\ + b_5\text{arrogance} + b_6\text{regulation} \quad (3)$$

Description:

AFB<sub>1</sub> = academic fraud behavior model 1

AFB<sub>2</sub> = academic fraud behavior model 2

AFB<sub>3</sub> = academic fraud behavior model 3

a = constant

b<sub>1</sub>, b<sub>2</sub>, b<sub>3</sub>, b<sub>4</sub>, b<sub>5</sub>, b<sub>6</sub> = regression coefficient

## 4. Results

### 4.1. Descriptives statistics

Respondents of this research is students majoring in economic education of Faculty of Economics UNNES grade 2016 as much as 321 students. Questionnaires are distributed

to the respondents. However, some questionnaires have not been answered nor submitted by the respondents. The response rate is 94,24%. In sum, data collection is described in the following Table 1.

TABLE 1: Data Description.

No	Class	Distributed Questionnaire	Processed Questionnaire	Response Rate
1	Administration Office Education	88	76	86,36%
2	Accounting Education	93	84	90,32%
3	Cooperative Education	80	79	98,75%
4	Administration Office Education of IUP	20	20	100,00%
5	Accounting Education of IUP	20	18	90,00%
6	Cooperative Education of IUP	20	20	100,00%
	<b>Total/ Average</b>	<b>321</b>	<b>297</b>	<b>94,24%</b>

Table 2 demonstrates the descriptive statistic of research variables, consist of minimum, maximum, mean and deviation standard. It can be concluded that mean from academic fraud behavior is 18,6054. This value means that academic fraud behavior is low. Students from Economics Education Department grade 2016 have ever conducted academic fraud behavior. In addition, pressure has mean of 20,2274, which describes that students receive low level of pressure. Moreover, the mean of opportunity, rationalization, and capability have value of 23,5251, 18,0903, and 12,7592. These mean that opportunity, rationalization and capability of students are high. Furthermore, external regulatory influence has mean of 18,1438 which categorized as high. Meanwhile, mean of arrogance is 6,8562 and describes that student's arrogance is low.

TABLE 2: Descriptive Statistic of Research Variables.

Variables	N	Minimum	Maximum	Mean	Std. Deviation
academic_fraud	297	10,00	34,00	18,6054	4,45840
pressure	297	11,00	33,00	20,2274	5,46205
opportunity	297	11,00	34,00	23,5251	4,27045
rationalization	297	8,00	28,00	18,0903	3,70677
capability	297	6,00	23,00	12,7592	3,46055
arrogance	297	4,00	12,00	6,8562	2,15570
regulation	297	5,00	25,00	18,1438	3,57603
Valid N (list wise)	297				

The description of academic fraud behavior of students in Department of Economics Education FE UNNES grade 2016 is described in Table 3. Results show that plagiarism is mostly conducted by students among other indicators of academic fraud behavior. In

addition, students of Cooperative Education are the greatest who conduct plagiarism. This condition is presumably because students have not understood plagiarism well, especially in doing their assignment. Other academic fraud behavior which conducted by respondents is wrong cooperation. Students from Administration Office Education become the most that conduct wrong cooperation. This wrong cooperation is executed when they have exam and their friends is allowed to copy their answers.

TABLE 3: Description of Academic Fraud behavior.

No	Class	Plagiarism	Data Fraud	Cheating	Wrong Cooperation
1	Administration Office Education	2,22	1,72	1,74	2,18
2	Accounting Education	2,07	1,38	1,56	1,94
3	Cooperative Education	2,36	1,94	1,71	2,14
4	Administration Office Education of IUP	1,85	1,65	1,67	2,15
5	Accounting Education of IUP	2,11	1,50	1,31	2,10
6	Cooperative Education of IUP	2,20	1,73	1,25	1,79
	<b>Average</b>	<b>2,18</b>	<b>1,66</b>	<b>1,62</b>	<b>2,07</b>

Table 3 shows interesting results. Students of Department of Economic Education FE UNNES have low level of cheating indicator. The statement items in questionnaire of cheating are prepare to cheat or notes, do cheating and use the notes, and copy friends' answers. Thus, students are individually realized that cheating is bad behavior. However, wrong cooperation is inevitable. It means that environmental factor (friends) greatly affects student cheating behavior.

#### 4.1.1. The result of hypotheses testing

Hypothesis testing is conducted in three stages, which are examining factors that affect academic fraud behavior of students in the perspective of fraud triangle, fraud diamond, and pentagon fraud. In addition, this study uses three regression equations. First regression equation involves the concept of fraud triangle with pressure, opportunity and rationalization as independent variables. Results are shown in Table 4.

Table 4 shows that this study has successfully provided empirical evidence on the concept of fraud triangle. Pressure, opportunity and rationalization have positive and significant effect on academic fraud behavior, both simultaneously and partially. The sig value in the F test (ANOVA table) is 0.000 with F value of 25.685. Meanwhile, the value of sig. In pressure is 0.005, sig value. of opportunity is 0.007 and sig value. of rationalization is 0.008. The sig values are lower than 0.05, hence pressure, opportunity

and rationalization affect students' academic fraud behavior. In addition, adjusted R square is 0.199, which means that pressure, opportunity and rationalization can explain academic fraud behavior by 19.9%. Whereas there remaining (80.1%) is explained by other variables outside the model.

TABLE 4: Hypothesis Testing and Fraud Triangle Concept.

	t test			F test		
	B	t	Sig.	F	Sig.	Adjusted R Square
Constant	7,197	5,194	0,000	25,685	0,000	0,199
Pressure	0,152	2,855	0,005			
Opportunity	0,193	2,696	0,007			
Rationalization	0,210	2,678	0,008			

The next hypotheses employ fraud diamond concept by presenting capability as new independent variable. F test results show the sig value. of 0,000 with F value of 19.276. The sig value is lower than significance level (0.05), thus pressure, opportunity, rationalization and capability have simultaneous effect on academic fraud behavior. In addition, t test (table coefficients) shows the sig value. of pressure, opportunity, and rationalization are 0.005, 0.007, and 0.009, respectively, which means lower than the significance level of 0.005. Hence, pressure, opportunity, and rationalization have empirically found to positively and significantly affect academic fraud behavior. Moreover, capability sig value. of 0,616 with t value equal to -0,512 higher than level of significance 0,05. It means that the variable capability does not have significant impact on academic fraud behavior. Furthermore, adjusted R square is 0,197, meaning that factors in fraud diamond concept can explain academic fraud behavior by 19.7%. Whereas the remaining (80.3%) is explained by other factors. In sum, this study fails to completely explain the concept of fraud diamond because capability (as new variable in fraud diamond concept) do not have positive and significant effect academic fraud behavior.

TABLE 5: Hypothesis Testing in Fraud Diamond Concept.

	t test			F test		
	B	t	Sig.	F	Sig.	Adjusted R Square
Constant	7,145	5,136	0,000	19,278	0,000	0,197
Pressure	0,163	2,833	0,005			
Opportunity	0,198	2,736	0,007			
Rationalization	0,230	2,617	0,009			
Capability	-0,050	-0,502	0,616			



The last test examines pentagon fraud concept in understanding student academic fraud behavior. New variables are presented in this pentagon fraud concept, which are arrogance and external regulatory influence. Arrogance is considered to have positive effect while external regulatory influence variable has negative effect. The results can be described in table 6. F test (ANOVA table) shows that the value of F equal to 13,531 with sig. value of 0.000, lower than the significance level of 0.05. Thus, pressure, opportunity, rationalization, capability, arrogance, and external regulatory influence simultaneously have significant effect on academic fraud behavior.

TABLE 6: Hypotheses Testing in Fraud Pentagon Concept.

	t test			F test		
	B	t	Sig.	F	Sig.	Adjusted R Square
Constant	8,192	3,675	0,000	13,531	0,000	0,201
Pressure	0,173	2,985	0,003			
Opportunity	0,203	2,788	0,006			
Rationalization	0,251	2,846	0,005			
Capability	0,032	0,287	0,775			
Arrogance	-0,291	-1,865	0,063			
Regulation	-0,045	-0,627	0,531			

The result of t test demonstrates the sig value. of pressure, opportunity, and rationalization are 0.003, 0.006 and 0.005, which lower than the 0.05 as the significance level. Therefore, pressure, opportunity, and rationalization have positive and significant effect on student academic fraud behavior. However, sig. value of capability is 0.775 which is greater than the significance level (0,05). Hence, capability do not have positive and significant effect on student’s academic fraud behavior. In addition, arrogance has t value of -1,865 with sig value. of 0.063 and higher than the 0.05 (significance level). It means that arrogance do not have positive and significant effect on student academic fraud behavior. Moreover, external regulatory influence has t value of -0.627 and sig value. of 0.531 which is higher than 0.05 (significance level). Thus, external regulatory influence does not affect the student’s academic fraud behavior. However, the regression coefficient of external regulatory influence is negative which means that external regulatory influence variable has negative but insignificant effect on student’s academic fraud behavior.

## 5. Discussion

### 5.1. Determinants of academic fraud behavior in Fraud triangle concept

Results explain the concept of fraud triangle in understanding factors that affect student academic fraud behavior. Pressure, opportunity, and rationalization have positive and significant effect on student academic fraud behavior. Pressure becomes the most dominant factors among opportunity and rationalization. Pressure experienced by students will greatly affect students to cheat. Academic fraud behavior can be plagiarism, cheating, data forgery and wrong cooperation. In addition, depressed students are more likely to commit fraud than students who experience low learning pressure.

Opportunity to cheat also affect students to conduct academic fraud. If there is an opportunity, student will be more likely to commit fraud. If the opportunity is relatively small, student will not do cheating. Furthermore, rationalization has positive and significant effect on student's academic fraud behavior. Students look for excuses to commit fraud. A lot of tasks, limited time, other friends also cheating are reasons that are considered rational to support their action. Less excuses by students will lower academic fraud behavior.

These findings are supported by previous research [6, 7, 13, 15]. However, other researchers [3, 9] fail to completely explain fraud triangle concept, because one dimension does not have significant effect on academic fraud behavior. Apriani, Sujana, & Sulindawati (2017) stated that pressure and rationalization significantly affect academic fraud behavior of accounting students in Undiksha, however opportunity has insignificant effect on academic fraud behavior. Rationalization also affect academic fraud behavior, whereas pressure and opportunity have insignificant impact [17]. Nevertheless, Kusumantoro, Nurkhin, Mukhibad, & Kiswanto (2016) showed that only opportunity that positively affect employee fraud.

### 5.2. Determinants of academic Fraud behavior in Fraud diamond concept

This study fails to prove the concept of fraud diamond in understanding factors that affect student academic fraud behavior. New variable in fraud diamond concept is capability, which do not have positive and significant effect to student academic fraud behavior. It can be interpreted that students will not do academic fraud even though they have the capability to do so. In the concept of fraud diamond, a person will cheat if he is able to do so. Especially in the state of depression, opportunity, and excuses.

However, fraud triangle dimension are the factors that have been shown to affect student academic fraud behavior.

This study is similar to previous researches that fails to completely explain fraud diamond concept in understanding factors that affect academic fraud behavior [11, 22]. Nevertheless, there were researchers that found positive effect of capability on academic fraud [12, 14]. However, they cannot fully prove the fraud diamond concept. They successfully demonstrated that opportunity, rationalization, and capability positively and significantly affect academic fraud behavior, and pressure does not affect academic fraud behavior. Meanwhile Zaini, Carolina, & Setiawan (2015) found different results. They showed that pressure has positive and significant effect on academic fraud behavior, whereas other fraud diamond elements (opportunity, rationalization and capability) cannot detect academic fraud behavior.

### 5.3. Determinants of academic Fraud behavior in Fraud pentagon concept

Fraud pentagon concept in this study is derived from Crowe (2011) who added competence and arrogance dimension and also a concept proposed by Tugas (2012) who uses external regulatory influence dimension. In Crowe (2011), a person will commit acts of cheating due to pressure, opportunity, rationalization, opportunity, and arrogance. Arrogance is an attitude of superiority to the rights it possesses, an individual feel that internal control or institutional policy does not apply to himself. Arrogance is an exaggeration shown by someone. Arrogance is a reflection of pride because he has more abilities than others. If someone has a high arrogance, then he will be more likely to commit fraud. This study unsuccessfully proves the positive and significant effect of arrogance on student academic fraud behavior. It means that arrogance is not the reason for students in Economic Education Department of FE UNNES to commit fraud. Based on the data, students have low arrogance level.

This study fails to describe the effect of external regulatory influence, like those stated in Tugas (2012). Academic fraud will not happen if the regulators are able to strictly enforce the rules and organize their member to comply the rules. This finding is similar to Aprilia (2017) who demonstrated that pressure from external party does not affect fraudulent financial statement. It is presumably because regulation in UNNES and FE is considered as weak to organize academic fraud behavior by students, However, Yusof (2016) successfully found that pressure can affect fraudulent financial statement, whereas other dimensions do not have significant effect.

## 6. Conclusion

Academic fraud behavior by students of Economic Education Department of FE UNNES grade 2016 is low (very rare). Plagiarism and wrong cooperation are indicators of academic fraud that mostly performed by students than other indicators. This research succeeded to prove the concept of fraud triangle, consist of pressure, opportunity and rationalization to have positive and significant effect on student academic fraud behavior. Students will cheat under pressure, opportunities, and if they have justification for cheating. However, this study failed to prove the concept of fraud diamond and fraud pentagon. Capability, arrogance and external regulation influence do not have significant effect on students' academic fraud behavior. Students will not commit fraud despite having a strong capability and arrogance. Moreover, external regulatory influence also cannot reduce student academic fraud behavior.

It is recommended that Head of Department and Dean held socialization and counseling related to academic fraud (especially plagiarism) and how to detect it. Thus, students will understand more and try not to commit academic fraud. Then, students are expected to reduce academic fraud, such as wrong cooperation in completing tasks, exams, and other activities. Furthermore, they need to improve their self-confidence and independence for their study in the campus.

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