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Contribution of Investment Efficiency in the Relationship of *Free Cash Flow* and Firm Value at Indonesia Stock Exchange

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Abstract

The objective of this research is to examine the mediation effect of investment efficiency (ROA) and the moderation effect of Syariah in the relationship of free cash flow on firm value (Tobin q). Research population involved all manufacturing companies at Indonesia Stock Exchange on period 2012-2018. Purposive sampling was used as sampling technique and the obtained sample was 36 companies with total observation of 252. Hypothesis test was conducted with PLS-SEM analysis technique supported by software WarpPLS 5.0. Type of data was data panel with observation period from 2012 to 2018. Several empirical results were obtained. First, free cash flow has positive and significant effect on firm value. Second, free cash flow has positive and significant effect on investment efficiency. Third, investment efficiency has positive and significant effect on firm value. Fourth, Syariah does not have moderation effect in the relationship of free cash flow on firm value. Last, investment efficiency mediates partially the effect of free cash flow on firm value. From these results, several conclusions were made. Firm value can be indirectly affected through intervening variable. Mediation role played by investment efficiency informs that investment efficiency proxied by ROA can alleviate the contradictive results of empirical studies (research gap) concerning the effect of free cash flow on firm value.

Keywords
free cash flow; investment efficiency; firm value; syariah

I. Introduction

The background of this research is the contradictive results of previous empirical studies concerning the effect of *free cash flow* on firm value. Agency theory has argued that monitoring the managing board of certain compay on how internal capital is used is often difficult and prone to produce *agent-principal* conflict with further implication in the form of low firm value. Empirical tests had been conducted on this theoretical framework and the results were contradictive, thus producing *research gap*. Those results are (1) that there is no effect from *free cash flow* on firm value (Martínez-Sola *et al.*, 2013; Al Zararee and Al-Azzawi, 2014; Lam *et al.*, 2015; Giriati, 2016; Achjen and Chokri, 2017) and (2) that *free cash flow* has effect on firm value (Park and Jang, 2013; Narayan and Westerlund, 2014; Chen *et al.*, 2016; Zhang *et al.*, 2016; Kadioglu *et al.*, 2017).

Research gap above is justified by two phenomena, which respectively are (1) low firm value and (2) multidirectional movement (fluctuation) of *free cash flow* in affecting firm value, or in other words, that the increase of *free cash flow* is not directly followed by the increase of firm value. Conversely, the reduction of *free cash flow* is followed by the increase of firm value. Contradictive results from previous studies and the unstable effect of *free cash flow* on firm value indicate that the current research has few starting points. First, *free cash flow* affects firm value. Second, factors beyond the current research may

have effect on this relationship. Or, the relationship of *free cash flow* on firm value is not direct but indirect. Finally, the relationship of *free cash flow* on firm value involves interaction (moderation) arrangement. This arrangement needs to be explored. By virtue of these indications, the current research takes 2 (two) objectives. First objective is that research will investigate the effect of *free cash flow* on firm value by positioning investment efficiency (ROA) as *intervening variable*. Research predicts that *free cash flow* can explain firm value through mediation of investment efficiency. Second objective is that research will analyze moderation effect. Hypothesis of *free cash flow* asserts that the inefficient use of *free cash flow* by the company management may cause low firm value (Jensen, 1986). Previous literatures claimed that religion mechanism can control *managerial opportunistic behaviour* (Noreen, 1988) and specifically upheld that Syariah identity can reduce managerial opportunistic behavior (Alsaadi *et al.*, 2017). Therefore, it is expected by the current research that Syariah, as one of research variables, can contribute to the role played by *free cash flow* in explaining firm value.

By taking into consideration of results of research, the current research has few contributions. First, research explores the causal relationship involving *free cash flow*, investment efficiency and firm value. Therefore, the results surely have contribution to agency theory. Second, research suggests the need for interaction (moderation) of Syariah in the relationship between *free cash flow* and firm value. Previous studies that explore the role of Syariah identity in the relationship of *free cash flow* and firm value are still quite few. Related to this matter, results of this research will give additional scope for syariah financial studies, other perspective for *corporate governance* literatures, and deeper understanding about agency theory.

The structure of this research comprises five sections. Section 1 is for introduction. Section 2 discusses literature review and hypothesis development. Section 3 is provided for methodology. Section 4 elaborates empirical results while Section 5 contains conclusion.

II. Review of Literature

Free cash flow hypothesis explains that if a company has a surplus of *free cash flow* but without profitable investment, then the managing board of this company tends to misuse *free cash flow* on inefficient resources, to fall into excessive consumptive behavior (*consumption of excessive prequisites*), and to make unnecessary investment or to invest monies on projects that have negative *net present value* (NPV). All these actions bring the company to a position of low firm value (Jensen, 1986). This hypothesis proposes a theory that there is negative relationship between *free cash flow* and firm value. However, validity test on *free cash flow hypothesis* did not get supporting proof (Martinez-Solano *et al*., 2013; Al-Zararee and Al-Azzawi, 2014; Lam *et al*., 2015; Giriati, 2016; Achjen and Chokri, 2017). Previous empirical studies found that *free cash flow* is often used rather as *proxy* for financial flexibility than as *proxy* for agency problem (Wu *et al.*, 2016). *Free cash flow* is a vital indicator for economic performance (Daniel *et al*., 2004). Therefore, the position of *free cash flow* is consistent to *pecking order theory* (Myers and Majluf, 1984).

Pecking order theory says that information asymmetry in the market may drive the company to choose investment fund option based on the rate of the risk. *Free cash flow* is a source of fund with lower risk rate. This characteristic has made *free cash flow* to be a priority for *capital expenditure*. If *free cash flow* is less available, then the company usually uses external financing, precisely by taking loans before issuing equity (Myers, 1984; Myers and Majluf, 1984). *Pecking order theory* also takes flexible position by asserting that *free cash flow* has positive impact on firm value, or in other words, there is

positive relationship between *free cash flow* and firm value (Mikkelson and Partch, 2003; Almeida *et al.*, 2004; Bates *et al.*, 2009; Morellec and Schürhoff, 2011; Martínez-Sola *et al.*, 2013; Wu *et al.*, 2016).

Relating to the review on theories and empirical studies regarding the relationship of *free cash flow* and firm value, first hypothesis is written as following:
H_1: *Free cash flow* has positive effect on firm value.

Value creation is always one of main goals of a business organization. The position of *value creation* is affected by several factors, including those controlled or not controlled by the managing board. *Free cash flow* is one of factors influencing *value creation* (Vogt and Vu, 2000) and is also a determinant of financial flexibility that has relation with investment efficiency (Jensen, 1986; Stulz, 1990; Shleifer and Vishny, 1997). Investment efficiency is formally defined as a condition/capability of a company to invest in projects that have positive *net present value* (NPV) (Biddle and Hilary, 2006; Gomariz and Ballesta, 2014). Other definition describes investment efficiency as an ideal (optimum) level of investment or *investing by prediction* (Linhares *et al.*, 2018; Abbas *et al.*, 2018). At company level, investment efficiency is estimated using static and dynamic methods. Both methods have similarity in two determinants, namely investment profitability and return on investment (Sujova *et al.*, 2015). In accounting and financial literature, the rate of return on investment is often operationalized through a measurement of *return on assets* (ROA) (Luoma and Spiller Jr, 2002). In this context, ROA is an approach to investment decision based on assets. This approach represents how good the managing board of a company is in using corporate resources to be invested at profitable sector. Besides, ROA is also a measure used to compare operational efficiency and operational performance across companies (Weygandt *et al.*, 2009). Referring to this position, ROA can be regarded as *financial-statement-based* approach, or ratio approach, not only for measuring investment efficiency but also for evaluating the effectiveness of performance of company's managing board (Kangarlouei *et al.*, 2012).

One of previous empirical studies found that any company lacking of cash for investment will find difficulty to survive and that *free cash flow* is a vital contributor to company profitability (Ravichandra and Mahendra, 2015). This statement is justified by other studies after examining factors influencing profitability. Of the supporter studies, one discovered that *free cash flow* is a factor with the greatest effect on *performance* (Abughniem *et al.*, 2020). Every company that wants to increase its profitability shall properly manage its *free cash flow* (Ali *et al.*, 2018) because having sufficient *free cash flow* is a fundamental indicator to produce operational smoothness of the company (Ojode, 2014). At the end, the operational smoothness will increase profitability or performance (Ogundipe *et al.*, 2012)

Based on the review on theories and empirical studies concerning the relationship of *free cash flow* and *return on assets* (ROA), second hypothesis is proposed as following:
H_2: *Free cash flow* has positive effect on *return on assets*.

Previous study revealed that there is significant relationship between ROA and value creation (Talebnia *et al.*, 2010). *Dividend irrelevance theory* infers that the value of a company (*firm value*) is determined by the capability of this company in delivering profits from operation (Modigliani and Miller, 1961). High profit is associated automatically with high firm value (Black and Scholes, 1974). Under *signaling theory* perspective, *return on assets* (ROA) is one of profitability measures. Similar to both investment decision and dividend policy, ROA contains information signal concerning future cash flow. From market perspective, future cash flow is not only a positive signal but also has positive impact on firm value (Leland and Pyle, 1977). Consistent to this perspective, previous

literature confirmed that firm value is determined by *earning power*. Whether *earning power* is high or low is affected by 2 (two) factors, respectively *profit margin* and *asset turnover*. High (higher) level of *earning power* indicates that the company has attained higher profit and its *asset turnover* has been efficient. Both high profit and efficient *asset turnover* help the company to achieve high firm value (Modigliani and Miller, 1958).

An empirical study had examined factors effectively influencing market value of 5 (five) oil companies. Result of this study showed that ROA is a factor that is effectively influencing market value of the companies (Fard *et al.*, 2011). This finding is supported by other studies in which the findings are generally stating that ROA has positive and significant effect on firm value (Bartram *et al.*, 2011; Naito and Laux, 2011), especially when ROA is measured through Tobin's Q (Bidhari *et al.*, 2013; Sucuahi and Cambarihan, 2016). By using sample from Indonesian public companies, the result of a study showed that direct relationship between profitability and firm value has positive *path coefficient* (Putu *et al.*, 2014). This result was interpreted by other study into few words. The interpretation is that high level of profitability is associated with high level of earning. If the level of earning distributed to shareholders is high, then this position signifies that firm value is increasing (Yang *et al.*, 2010). The same study also said that ROA is a measurer of asset efficiency and has positive relationship with firm value (Yang *et al.*, 2010). Other findings related to this position are that there is strong relationship between ROA with *market value* (Abbadi and Abu-Rub, 2012) and also with Tobin q (Sabrin *et al.*, 2016; Rosikah *et al.*, 2018; Ayuba *et al.*, 2019).

With reference to the review on theories and empirical studies concerning the mediation of *return on assets* (ROA) in the relationship of *free cash flow* (FCF) and *firm value*, third hypothesis is described as following:

H_3: *Return on assets* mediate the effect of *free cash flow* (FCF) on firm value.

Few literatures consider religion as one of important factors with direct effect on the attitude and behavior of any individual and also as one factor with indirect effect on the decision and action of any organization (Gait, 2009; Hilary and Hui, 2009; Chen *et al.*, 2013; Du, 2013). Organization must have a goal to be achieved by the organizational members (Niati et al., 2021). The success of leadership is partly determined by the ability of leaders to develop their organizational culture. (Arif, 2019). Several empirical studies showed that the companies in the situation of a social norm characterized by strong religiosity are those known for its high accreditation quality, its strong eagerness toward voluntary information disclosure, and its low possibility of *restatement* or of deviation against accounting standards (Callen *et al.*, 2011; McGuire *et al.*, 2011; Dyreng *et al.*, 2012; Chen *et al.*, 2013; Du *et al.*, 2014). Religion-based mechanism can strengthen the supervision on information and reduce the risk of misstatement in financial reporting. This position signifies that this mechanism can decrease information asymmetry (Hu *et al.*, 2018). All empirical findings concerning this matter generally argued that religion can be used as *corporate governance* mechanism because religion can reduce managerial opportunistic behavior and increase transparency.

Religion has ethical and practical manuals that have been applied consistently to produce ethical business behavior (Brammer *et al.*, 2007). This perception is justified by empirical studies that have proven the relationship between religion and business ethics (Calkins, 2000; Epstein, 2002; Weaver and Agle, 2002). Relevant to this context, Islam has provided a comprehensive system of business ethics. One principle underlying this system is *gharar*. Different from conventional financial market, which is prone toward information asymmetry, *gharar* principle leads Islam-based financial system to be arranged toward information symmetry. Besides, Islam system forbids taking risk by

putting others in the suffering position. This principle, called *maysir*, restrains the transfer of wealths (through investment) into high risk projects (Toumi *et al.*, 2012). Both *gharar* and *maysir* principles, in the end, can act as a monitoring tool to reduce managerial opportunist behavior which, in turn, can minimize agency conflict (Toumi *et al.*, 2012). All these perspectives agree that *Syariah* (Islam law) is a factor enabling the company to obtain high quality information and also to improve moral behavior of individuals in the company. *Syariah* also helps agent to act on the interest of *principal*, especially in relation with the use of *free cash flow*. Good moral posture in the use of *free cash flow*, in the end, will contribute to strengthening the relationship between *free cash flow* and firm value.

By taking the statements above into consideration, a hypothesis is set as following:
H_4: Syariah moderated the effect of *free cash flow* on firm value.

III. Research Method

3.1 Sample

Population of research comprises stock issuers in manufacturing sector enlisted at Indonesia Stock Exchange on period 2012-2018. Sample was selected with four criteria, respectively (1) that the issuers have published both financial and annual statements on period 2012-2018; (2) that financial statements are prepared in Indonesian rupiah (IDR); (3) that the issuers never get *suspended*; and (4) that the issuers have complete data during period 2012-2018 in order to be used in the measurement of variable indicators. After applying these criteria, the obtained sample was 36 issuers with 252 observations. Source of relevant data derives from three sites, namely *idx.co.id*, *idn financial*, and *yahoo finance*.

3.2 Model

This research attempts to analyze the indirect effect involving *free cash flow* and firm value. Control variable consists of *leverage* and *quick ratio*. Conceptual model depicting the relationship between *free cash flow* and firm value is illustrated as following:

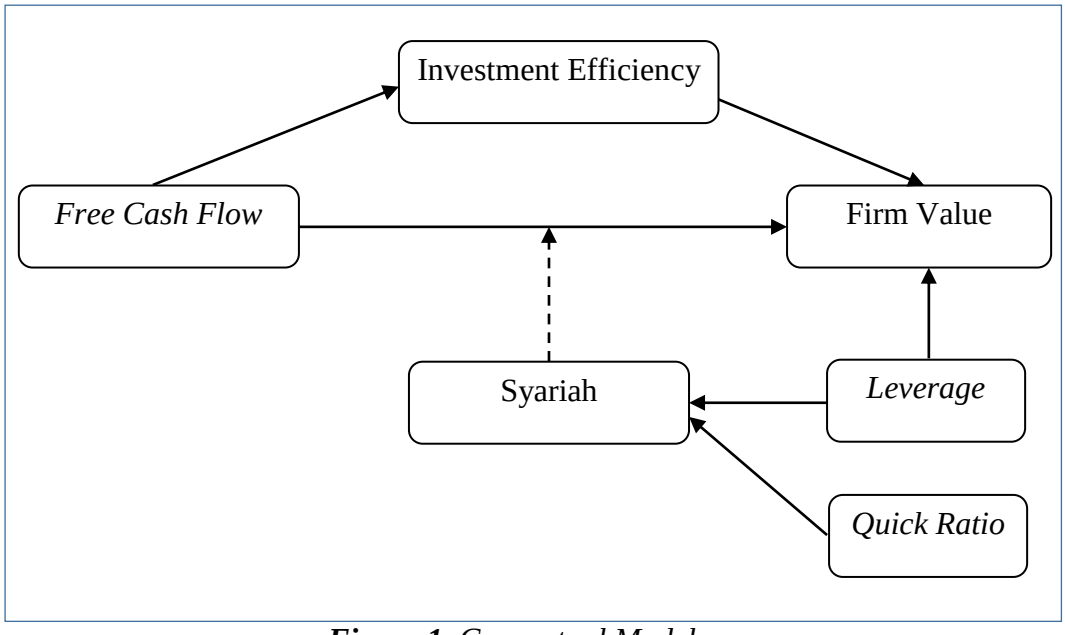

Figure 1. *Conceptual Model*

3.3 Proxy of Measurement

Free cash flow (FCF) is measured using *residual model of free cash flow* developed by Lehn and Poulsen (1989). Mathematic formula of this residual model is written as following:

$$FCF_{i,t} = \frac{EBITDA_{i,t} - TA_{i,t} - INTEXP_{i,t} - DIV_{i,t}}{TA_{i,t-1}}$$

$FCF_{i,t}$ = *free cash flow* of the company i at the end of year t; $EBITDA_{i,t}$ = operational earning before depreciation and amortization of the company i at the end of year t; $TA_{i,t}$ = tax expense for the income of the company i at the end of year t; $INTEXP_{i,t}$ = interest expense of the company i at the end of year t; $DIV_{i,t}$ = the level of dividend payment (preference stock and general stock) of the company i at the end of year t; and $TA_{i,t-1}$ = total assets of the company i at the end of year $t-1$ (*lag* total asset).

Investment Efficiency (IE) is measured with *return on assets* (ROA) whereas firm value is proxied by Tobin Q. Meanwhile, Syariah is positioned as variabel *dummy*, which the value is determined as 1 if the stock of the company is in Syariah category and determined as 0 if the stock is not Syariah. Control variable comprises criteria of Syariah, respectively *leverage* proxied by *debt to asset ratio* (DAR) and *quick ratio* proxied by *account receivable to total asset ratio* (ARTA).

With respect to the conceptual model and proxies previously explained, then the empirical model of hypothesis tests, which indicates the relationship across variables, is arranged into three equations as following:

$$Tobin\ q_{i,t} = \beta_0 + \beta_1 FCF_{i,t} + \beta_2 ROA_{i,t} + Control_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$ROA_{i,t} = \beta_0 + \beta_1 FCF_{i,t} + \varepsilon_{i,t} \quad (2)$$

$$Tobin\ q_{i,t} = \beta_0 + \beta_1 FCF_{i,t} + \beta_3 Syariah_{i,t} + \beta_4 FCF_{i,t} * Syariah_{i,t} + \sum Control_{i,t} + \varepsilon_{i,t} \quad (3)$$

IV. Results and Discussion

Hypothesis test is conducted using SEM-PLS. Empirical results of the test are elaborated through a position called *goodness of fit*. The following table contains criteria and parameters that make up the position of *goodness of fit*.

Tabel 1. *Goodness of Fit* of Structural Model

Criteria	Parameter
Average Path Coefficient (APC)	0.351***
Average R-squared (ARS)	0.405***
Average Adjusted R-Squared (AARS)	0.400***
Average Block VIF (AVIF)	1.542
Average Full Collinearity VIF (AFVIF)	1.874
Tenenhaus GoF (GoF)	0.636
Sympson's Paradox Ratio (SPR)	1.000
R-Squared Contribution Ratio (RSCR)	1.000
Statistical Suppression Ratio (SSR)	0.857
NonLinear Bivariate Causality Direction Ratio	0.857

(NLBCDR)	

***, **, * denotes significance levels at 0.001, 0.05 and 0.1, respectively

In conformity with what is presented in Table 1, research model is considered "fit" based on three indicators (criteria), namely ARS, AVIF, and APC. Each *p-value* of ARS and APC is less than 0.5 (at significance level of 0.001), precisely 0.405 and 0.351. The coefficient value of AVIF also confirms the condition of *goodness of fit* for research model because the value stands below 3.3 (precisely 1.542). All these values signify that there is no multicollinearity across indicators and also across exogenous variables. This position indicates that the model proposed by this research has been supported by data.

Empirical results of hypothesis test are then arranged into a model shown in Figure 2.

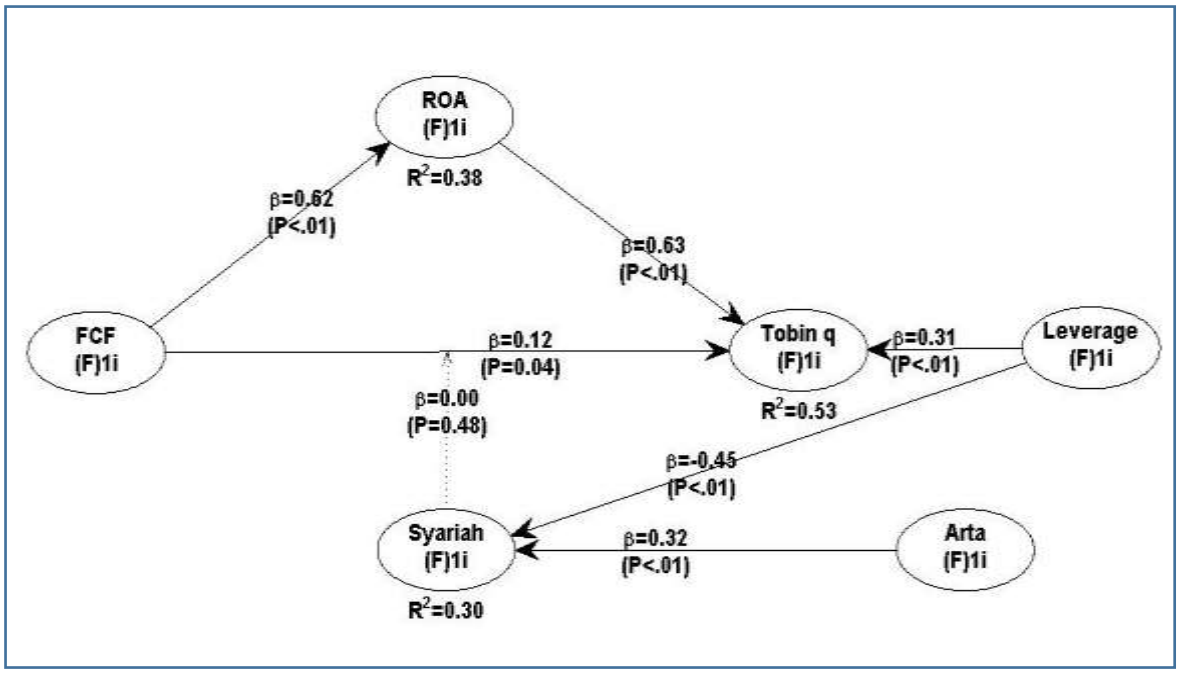

Figure 2. *Empirical Model*

In accordance with Figure 2, the effect of *Free Cash Flow* (FCF) on Return on Assets (ROA) is estimated to be positive and significant with path coefficient value of 0.62 and *p-value* below 0.01. By this result, Hypothesis 1 is accepted. This position is in line with the findings of previous empirical studies.

The effect of ROA on Tobin q is estimated to be positive and significant with path coefficient value of 0.63 and *p-value* smaller than 0.01. Based on this estimation, Hypothesis 2 is accepted and this position corresponds with the findings of previous empirical studies.

Result of hypothesis test on Hypothesis 3 was shown in Table 2 which informs indirect effect value, total effect value and p-value.

Table 2. Output *Indirect Effect* and *Total Effect*

Indirect effect for paths with 2 segments							
	FCF	Tobin q	Leverage	ROA	Syariah	Arta	Syariah
FCF							
Tobin q	0.391						
Leverage							

ROA							
Syariah							
Arta							
Syariah							
P values of indirect effects for paths with 2 segments							
	FCF	Tobin q	Leverage	ROA	Syariah	Arta	Syariah
FCF							
Tobin q	0.0304						
Leverage							
ROA							
Syariah							
Arta							
Syariah							
Total Effects							
	FCF	Tobin q	Leverage	ROA	Syariah	Arta	Syariah
FCF							
Tobin q	0.508		0.312	0.632			0.003
Leverage							
ROA	0.618						
Syariah			-0.452			0.322	
Arta							
Syariah							
P values for total effects							
	FCF	Tobin q	Leverage	ROA	Syariah	Arta	Syariah
FCF							
Tobin q	< 0.001		0.002	<0.001			0.482
Leverage							
ROA	<0.001						
Syariah			<0.001			<0.001	
Arta							
Syariah							

Source: Output WarpPls

By virtue of the information stated in Table 2, the value of VAF = $\frac{IE}{TE} = \frac{0.391}{0.508} = 0.769$. This value proves that investment efficiency is proxied by return on assets (ROA) and found to be able to mediate partially the effect of *Free Cash Flow* (FCF) on firm value (Tobin q). This finding indicates that the effect of FCF on firm value is higher if the relationship is indirect effect in nature. Hypothesis 3 is accepted.

Pursuant to the content in Table 2, Syariah is found to not have moderation effect on the relationship of *Free Cash flow* (FCF) on firm value. Or, Syariah is not said as capable to influence the relationship between FCF and firm value. Hypothesis 4 is, therefore, rejected.

V. Conclusion

This research is aimed to examine the mediation effect of investment efficiency (ROA) and the moderation effect of Syariah in the relationship of *free cash flow* on firm value (Tobin q). Result of research showed that investment efficiency can mediate partially the effect of *free cash flow* on firm value. In the other hand, empirical result of this research indicated that Syariah does not moderate the relationship between *free cash flow* and firm value. Based on this position, the research concludes that the effect of *free cash flow* on firm value can be reinforced through mediation of investment efficiency.

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