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Street earnings as a mediator of the effect of intellectual capital disclosure, customer value, and research development activities on firm value

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Abstract. This study is driven by the phenomenon of earnings indicators that can mislead investors due to managers' personal interests. As a result, investors would seek alternative earnings through analysts serving as intermediaries, referred to as street earnings. Street earnings are considered more predictive, informative, and more likely to be used to assess firm value. Furthermore, non-financial information from the corporation can affect street earnings. As a result, this study attempts to determine whether street earnings affect firm value while also determining whether it can mediate the relationship between non-financial information on firms with firm value. This analysis makes use of 392 observations from manufacturing firms between 2015 and 2020. SPSS 25 and the Sobel test are used to conduct data analysis. One of the three hypothesis is proven, namely that research and development activities directly and indirectly affect street earnings and firm value. If street earnings can moderate the relationship between the two variables, this conclusion is also supported by the Sobel test.

Keywords. Street earnings

I. Introduction

This study is motivated by the phenomenon of company earnings indications that can mislead investors. This is because the company's earnings are generated by managers who have a personal incentive to increase bonuses (Beneish, 2001; Moradi et al., 2015). As a result, investors will seek alternative sources of earnings information, one of which by securities analysts (Bardos et al., 2011). Securities analysts are viewed as more independent because their role is limited to serving as a liaison between investors and companies (Barker et al., 2008). The analyst will publish street earnings as a result of the analysis (Sadique & Rahman, 2013).

Street earnings are generated by adjusting for non-recurring items on the income statement. There is no universally accepted definition of non-recurring items. However, previous research has included the following as non-recurring items: restructuring costs, acquisition costs, gains on asset sales, the realization of investment gains (Gu & Chen, 2004), write-down costs and impairment,

research and development expense, merger and acquisition costs, mandatory share compensation expenses, amortization of goodwill, and certain proceeds from subsidiaries (Bradshaw & Sloan, 2002).

Adjustments made by analysts are not limited to non-recurring items. Non-financial information also affects analysts. The three of information are intellectual capital, the company's customer strategy, and future product plans. First, analysts will gravitate toward companies that disclose their intellectual property (Farooq & Nielsen, 2014) to bolster the recommendations made (Abhayawansa & Guthrie, 2012). Second, analysts are more interested in companies that can deliver on customer expectations, ensuring that the recommendations meet investors' expectations (Ngobo et al., 2012). Third, analysts will naturally tend toward companies that are perpetually engaged in product development, resulting in future earnings growth (Chung & Choi, 2017).

This study examines explicitly two main problems. First, it attempts to prove the expectation of street earnings to determine the firms value, as stated in previous studies. Second, it emphasizes the role of analysts as intermediaries so that street earnings can bridge the influence of non-financial information and firm value. Street earnings also reflect three financial information: intellectual capital, corporate strategy towards customers, and research and development activities.

The findings of this study provide guidance to investors on how to use street earnings in place of company-issued earnings. Based on previous research, this study will examine a single phenomenon through the lens of three research questions: (a) can street earnings mediate between intellectual capital information and firms value? (b) can street earnings be capable of mediating information between corporate strategy and firms value? (c) can street earnings be capable of mediating information between research development activities and firm value?

This study examined the direct and indirect effects of three non-financial information on firm value through street earnings. This method is carried out to strengthen the conclusion that street earnings can be an intermediary and a reliable value for phenomenon at the beginning of the discussion.

II. Literature review and hypothesis development.

2.1 Resources-based theory

The basis of this theory is that there is a strong relationship between competitive advantage and leading performance, for example, through superior production systems, low structured costs and building customer service. The resources acquired must enable the company to develop strategies that meet customer expectations and strengthen its sustainably. The critical resources are intangible assets (e.g., positive client relationships and trust) and capabilities (e.g., expertise and knowledge)(Clulow et al., 2007).

2.2 Street earnings

Earnings generated through the accounting process are not always sufficient to satisfy all parties, and investors will seek additional information to provide a complete picture of the company's condition. Financial analysts (Rachmawati & Susilawati, 2008), analyst tracking services (Baik et al., 2009), or sell-side analysts publish street earnings because their role as intermediaries between companies and investors (Barker et al., 2008) is to provide market-based prices and report recommendations ((Asquith et al., 2005; Barron et al., 2002).

Street earnings are calculated independently of accounting earnings (Sadique & Rahman, 2013). They are referred to in various studies as I/B/E/S earnings (Entwistle et al., 2011), analyst forecasts (Haw et al., 2010) or analyst consensus earnings forecasts (Barth et al., 2012).

2.3 Firm value

Article I. Firm value refers to the price at which prospective investors are willing to purchase a company (Wardhani, 2013) or to investors' perceptions of the company's level of success (Debby et al., 2014). The stock price is a good indicator of a company's value. If the stock price increases, all management decisions made by the company are correct. Firm value reflects market value, as a firm value can maximize shareholder prosperity if the company's stock price increases (Wardhani, 2013). In reality, not all companies desire high stock prices; they are concerned that they will fail to sell or attract investors, and thus the stock price must be as favorable as possible. Excessively low stock prices can have a detrimental effect on a company's image in the eyes of investors (Wardani & Hermuningsih, 2011)

2.4 Intellectual capital information

Intellectual capital has numerous definitions, but all share a common understanding: it is a critical factor in a company's future success but is not visible on the balance sheet (Jacobsen et al., 2005), has the potential to generate value for the company and the surrounding environment (Mavridis & Kyrmizoglou, 2005), and can be used to gain a competitive edge in business, particularly in manufacturing (Nimtrakoon, 2015).

According to one study, analysts are more likely to recommend companies with intellectual capital information (Abhayawansa & Guthrie, 2012). Four studies demonstrate a significant and positive effect of intellectual capital on firm value (Cicilya et al., 2014; Handayani, 2015; Widarjo, 2011; Yusuf & Gasim, 2015), implying that investors view human capital as a source of competitive advantage and structural capital as a catalyst for transformation. Individual knowledge becomes corporate knowledge, and capital is used as the primary source of total company wealth creation (Yusuf & Gasim, 2015) as information in investment decision analysis, allowing potential investors to understand better the company's prospects (Widarjo, 2011). As a result, intellectual property management can operate more efficiently and increase market appreciation, thereby increasing the company's value (Cicilya et al., 2014).

According to one study, street earnings can be used to determine firm value because they eliminate non-recurring items from the calculation, allowing for a more accurate prediction of future cash flows, including firm value (Bradshaw & Sloan, 2002).

The six studies above examine the three variables separately. However, they can be combined because street earnings are influenced by intellectual capital information and are also helpful in determining firm value, implying the following hypothesis:

H1 : *street earnings* mediates the relationship between intellectual capital information and firm value.

2.5 Customer Value Disclosure (CVD)

Customer Value Disclosure (CVD) is a term that refers to a description of a value proposition that is accepted by customers, capable of attracting and retaining customers, and capable of meeting the desired target. CVD contains outcome indicators that are directly related to the customer, such as satisfaction and loyalty. Additionally, CVD contains information about a company's capabilities

and indicators for satisfying its customers, such as product market share, product advantages, product safety, and customer programs (Ledoux et al., 2014).

There are no studies that demonstrate a direct correlation between customer value and street earnings or firms value, but the following three studies provide an explanation. The first study was conducted by 1,671 analysts between 1994 and 2004, who analyzed 111 companies and discovered that the more satisfied customers were, the lower the analysts' earnings prediction error, implying that customer satisfaction protects analysts' reputations when providing recommendations to investors (Ngobo et al., 2012).

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The second study examined secondary data from 1995 to 2005, specifically by American Customer Satisfaction Index (ACSI) and Tobin's Q as a proxy for firm value. The findings indicate that customer satisfaction significantly and positively affects firm value, implying that customer satisfaction enables the firm to add more value (value enhancement) (Basuroy & Gleason, 2014).

The third study demonstrated that street earnings could determine firm value because they excluded non-recurring items from calculation, allowing for a more accurate prediction of future cash flows, including firm value (Bradshaw & Sloan, 2002).

Although no studies have been conducted to establish a direct link between customer value, firms value, and street earnings, it is logical to assume that satisfaction is included in customer value. Customer value disclosure to stakeholders will increase analyst appreciation via street earnings and affect firm value, as the following hypothesis is proposed:

H2: street earnings mediates the relationship of customer value information towards firm value.

2.6 Information on research and development activities.

Research and development is also a critical component for analysts when forecasting the future performance of companies. One study examined whether research and development activities affect the future value of analysts' street earnings. The goal was to determine whether the analyst modifies the value assigned when the research activity is disclosed using data from 1,438 companies between 1990 and 1999. The revised value is calculated by subtracting the number of analysts who make revisions from the total number of analysts for the 20 days following the earnings announcement. It was discovered that the higher the research and development costs, the more analysts revised the street earnings value, implying that research activities provide a wealth of information for investors, necessitating analyst revisions to meet investor expectations (Ho et al., 2007).

Without considering research expense, research disclosure has a significant and positive effect on firm value, which means that investors must consider information about a company's research activities from various sources when making investment decisions (Nekhili et al., 2016).

The last study demonstrated that street earnings can be used to determine firm value because they eliminate non-recurring items from the calculation, allowing for a more accurate prediction of future cash flows, including firm value (Bradshaw & Sloan, 2002).

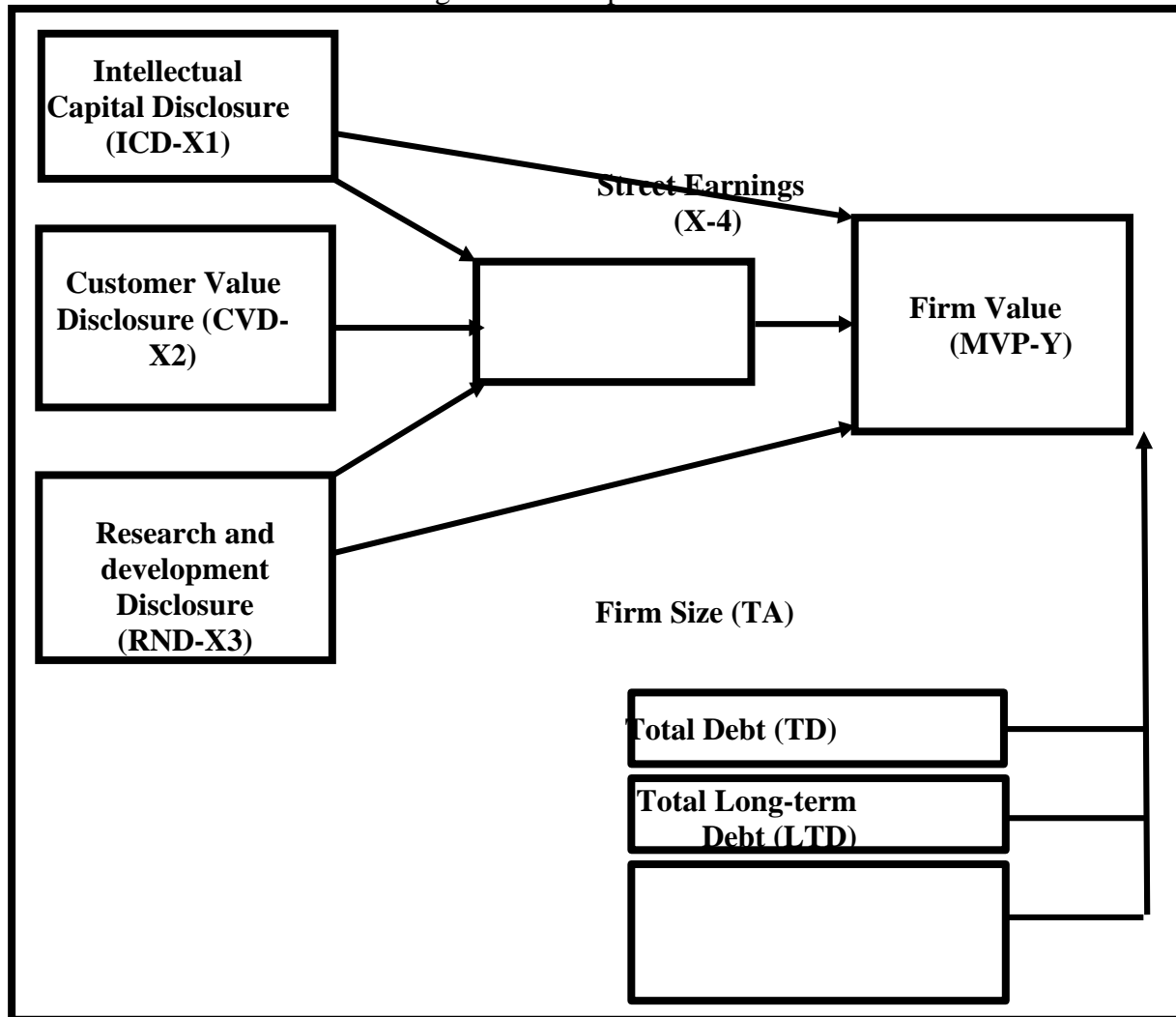
The three studies cited above demonstrate that research and development can influence analysts' estimation of street earnings and have an effect on firm value, thereby supporting the proposed hypothesis.

H3: street earnings mediates the relationship between research and development activities and firm value.

2.7 Conceptual framework linking intellectual capital, customer value, research and development, street earnings and firm value

The conceptual framework is presented in Figure 1 concerning the problems and hypotheses proposed. Multiple variables are used in the conceptual framework, including three independent variables, one dependent variable, and three controlling variables.

Figure 1. Conceptual Framework



III. Method

3.1 Sample selection

Data were collected using purposive sampling per the study's objectives to test the hypotheses above. The annual report and OSIRIS database were used to compile the data for the period 2015–2020. The sample is drawn from all manufacturing companies in Indonesia that do not have a negative equity value and that present financial statements in the rupiah currency.

3.2 Variables and measurements

Three independent variables, one intervening variable, one dependent variable, and three controlling variables are used in this study to test hypotheses using path analysis and the Sobel test.

3.2.1 Path analysis

Path analysis is a subset of multiple linear regression analysis, or it is the application of regression analysis to estimate a predefined causal relationship based on theory. Path analysis alone cannot establish a causal relationship and should not be used to replace researchers' ability to see causal relationships between variables (Ghozali, 2016). This method requires six regression equations that illustrate the hypothesized relationships. The regression equation is as follows:

$$\text{STREET}_{it} = a + \beta_1 \text{ICD}_{it} + \beta_2 \text{TA}_{it} + \beta_3 \text{TD}_{it} + \beta_4 \text{LTD}_{it} + e \quad (1)$$

$$\begin{aligned} \text{MVP}_{it} &= a + \beta_1 \text{ICD}_{it} + \beta_2 \text{TA}_{it} + \beta_3 \text{TD}_{it} + \beta_4 \text{LTD}_{it} \\ &+ \beta_5 \text{STREET}_{it} + e \end{aligned} \quad (2)$$

$$\text{STREET}_{it} = a + \beta_1 \text{CVD}_{it} + \beta_2 \text{TA}_{it} + \beta_3 \text{TD}_{it} + \beta_4 \text{LTD}_{it} + e \quad (3)$$

$$\begin{aligned} \text{MVP}_{it} &= a + \beta_1 \text{CVD}_{it} + \beta_2 \text{TA}_{it} + \beta_3 \text{TD}_{it} + \beta_4 \text{LTD}_{it} \\ &+ \beta_5 \text{STREET}_{it} + e \end{aligned} \quad (4)$$

$$\text{STREET}_{it} = a + \beta_1 \text{RND}_{it} + \beta_2 \text{TA}_{it} + \beta_3 \text{TD}_{it} + \beta_4 \text{LTD}_{it} + e \quad (5)$$

$$\begin{aligned} \text{MVP}_{it} &= a + \beta_1 \text{RND}_{it} + \beta_2 \text{TA}_{it} + \beta_3 \text{TD}_{it} + \beta_4 \text{LTD}_{it} \\ &+ \text{STREET}_{it} + e \end{aligned} \quad (6)$$

Notes :

i = 1,.....,N

t = 2015 – 2020

STREET = ratio of street earnings to total asset

MVP = Price to Book Value (PBV) ratio

ICD = ratio of intellectual capital disclosure score

CVD = ratio of customer value disclosure score

RND = ratio of research and development disclosure score

TA = companies size in term of log natural total asset

TD = ratio of total debt to total asset

LTD = ratio of long term debt interest bearing to total asset

a = constanta

e = error term

3.2.2 Sobel Test

The Sobel test, developed by Sobel (1982), can test hypotheses about intervening variables. The Sobel test was conducted with the assistance of the Sobel test calculator (Preacher & Leonardelli, 2021). If the resulting p-value is less than 0.05 (5%) (Jannah & Khoiruddin, 2017), the intervening variable can mediate the relationship between the two variables.

3.2.3 Intellectual Capital Disclosure (ICD)

The disclosure score is used to quantify this variable. This score is calculated by adding the values for three categories: Human Capital (HC), Structural Capital (SC), and Relational Capital (RC). Human Capital (HC) consists of nine sub-items, Structural Capital (SC) consists of eighteen sub-items, and Relational Capital (RC) consists of fourteen items, for a total of 41 sub-items (Ulum, 2015; Wang et al., 2016). Each score is assigned a value of 4 if the item is expressed in a narrative, numerical, or monetary units; 3 if the item is disclosed in monetary units; 2 if the item is disclosed quantitatively; 1 if the item is disclosed qualitatively; or 0 if the item is not disclosed at all. The following is the calculation formula (Widarjo, 2011):

$$ICDI_{ij} = \frac{\sum X_{ij}}{N_{ij}}$$

Notes :

- ICDI : Intellectual Capital Disclosure Index
- $\sum X$: total score intellectual capital disclosure each company
- N : total score disclosure for 41 items
- i : 1,.....,N
- j : 2015 - 2020

3.2.4 Customer Value Disclosure (CVD)

Customer value disclosure (CVD) summarises disclosures that describe both the indicators and outputs of customer acquisition success. These indicators pertain to customer satisfaction, loyalty, and market share, as determined by the annual report's disclosure score. Each score is assigned a value of 3 if the element is described in monetary terms or given a numerical explanation; 2 if the element is described; or 1 if the element is simply discussed or given a brief explanation. The following formula is used (Ledoux et al., 2014):

$$CVDI_j = \frac{\sum X_{ij}}{N_j}$$

where,

- CVDI : Customer Value Disclosure Index
- $\sum X$: total score customer value disclosure each company
- N : total score of customer value disclosure for 15 item

i : 1,.....,N
j : 2015 - 2020

3.2.5 Research and Development Disclosure

This study uses research and development disclosure (R&D Disclosure), which is data included in annual reports and classified into five categories. The score ranges from 0 to 3, with 0 indicating that the item is not disclosed; 1 indicating that the item is disclosed in broad terms; 2 indicating that the item is disclosed in descriptive terms; or 3 indicating that the item is disclosed in monetary terms. The following formula is used (Ledoux & Cormier, 2013):

$$RDI_j = \frac{\sum X_{ij}}{N_j}$$

where,

RDDI = research and development index
 $\sum X$ = total score research and development each company
 N = total score of research and development index for 5 item
 i = 1,, N
 j = 2015 - 2020

3.2.6 Street earnings (STREET)

Street earnings are modified accounting earnings in which several components of nonrecurring items are omitted from the calculation (Heflin et al., 2015), such that the modified formula is:

Street earnings = earnings – non recurring item

notes :

Earnings = net profit based on accounting standard,
 Nonrecurring items = restructuring costs, acquisition costs, gains on asset sales, realized investment gains, and other undefined items (Gu & Chen, 2004), write-down and impairment costs, research and development expenses, merger and acquisition costs, goodwill amortization (Bradshaw & Sloan, 2002), stock-based compensation costs (Barth et al., 2012; Bradshaw & Sloan, 2002) and unusual/exceptional items.

3.2.7 Firm Value (MVP)

To determine firm value, the Price to Book Value ratio is used with the following formula (Wardani & Hermuningsih, 2011):

Article II. PBV = Share price / BV

Notes :

PBV = Price to Book Value
 Share price = share price three month after year-end,

Book Value (BV) = price ratio calculated by dividing the total net assets (assets – debt) by the total outstanding shares.

3.2.8 Control variables

Three controlling variables are used in this study: total assets, total debt, and total long-term debt with an interest component. Company size is proxied by total assets. The raw data is then transformed into data that is the natural logarithm of the data itself (Ln Total Assets) to obtain more accurate and reliable results (Kristanti & Priyadi, 2016). Total long-term debt is calculated by comparing long-term interest-bearing liabilities to total assets (Feng et al., 2015).

IV. Results and discussion

4.1 Descriptive Statistics

This study used a valid sample of 65 companies from 2015 to 2020, which resulted in 392 observational data after removing outliers. The following are the descriptive statistics for this study:

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Firm value (MVP)	392	-2.123	4.412	.43024	1.144701
Street earnings (STREET)	392	-.395	.561	.06341	.102680
Intellectual Capital Disclosure (ICD)	392	.013	.308	.16464	.056665
Customer Value (CVD)	392	.000	.243	.04685	.044402
Research and Development (RND)	392	.000	.545	.06634	.115260
Company size (TA)	392	2.929	3.280	3.07927	.076207
Total debt (TD)	392	.091	.915	.43448	.197579
Total long-term debt (LTD)	392	.000	.538	.07881	.112014
Valid N (listwise)	392				

The above table 1 indicates the following:

a. The value of the company has a minimum value of -2.123 and a maximum of 4.412. These values are the natural logarithm of PT Indospring Tbk's minimum Price Book Value (PBV) of 0.12 at a closing share price Rp. 350 / share and PT Unilever Tbk Price to Book Value (PBV) of 82.4 at a closing share price Rp. 11.180 / share. The average logarithm of the company's value is 0.43024 (43%), implying an average Price Book Value (PBV) of 1.542x.

b. Street earnings has a minimum value of -0.395 and a maximum of 0.561. The minimum value is held by PT Keramika Indonesia Assosiasi Tbk, which has a street earnings value of Rp. 486,512,781 and PT Unilever Tbk, which has a street earnings value of Rp. 8,824,293,000. The mean street earnings value of 0.06373 equals 6.3% of total assets.

c. Intellectual capital disclosure has a minimum value of 0.013 and a maximum value of 0.308. PT Sawit Sumbermas Sarana Tbk owns the minimum disclosure value of 1.3%, while PT Kalbe Farma Tbk owns the maximum disclosure value of 30%. The mean value of 0.16500

indicates that the average disclosure of intellectual capital by 66 companies is 16% of the 41 items required.

d. Customer value has a minimum customer value of 0.00 and a maximum of 0.243. This minimum value implies that some companies, such as PT Sawit Sumbermas Sarana Tbk, do not disclose customer value in their annual reports. The maximum value indicates that companies disclose 24.3% of the 15 specified items. PT Astra Otoparts Tbk, PT Indofarma Tbk, and PT Multi Bintang Indonesia, Tbk own the maximum value. The mean value of 0.04687 indicates that the average business discloses only 4.6% of the required information.

e. Research and development has a minimum score of 0.00 and a maximum of 0.545. This minimum value indicates that some companies, such as PT Sawit Sumbermas Sarana Tbk, PT Betonjaya Manunggal Tbk, and PT Gudang Garam Tbk, do not disclose their research and development activities in their annual reports. The maximum value indicates that 54.5% of the five required items are disclosed by companies owned by PT Kalbe Farma Tbk. The mean value of 0.06634 indicates that the average company discloses only 6.6% of the five required items.

f. Company size is proxied by total assets owned. The natural logarithm of total assets has a minimum value of 2,929 and a maximum value of 3,280, with the minimum total asset owned by PT Liomesh Prima, Tbk being Rp. 133,782,751 000 and the maximum total asset owned by PT Kedaung Indah Can Tbk being Rp. 133,831,889,000. While PT Astra International Tbk's maximum total asset value is Rp. 351,958,000,000,000. The mean of 3.07927 indicates that the company under study has an average asset value of Rp. 2.782.007.330.

g. Total debt has a minimum value of 0.091 and a maximum of 0.9155. This minimum value is held by PT Intanwijaya International, which has a total debt of Rp. 15,494,757,000, or 9.1% of total assets, and PT Saranasentral Bajatama, Tbk, with a total debt of Rp. 762,683,580,000, or 91.5% of total assets. The mean of 0.43448 indicates that the average company's total debt is 43.48% of total assets.

h. Long-term debt is interest-bearing debt with a minimum value of 0.000. This value means that some companies, such as PT Champion Pacific Indonesia Tbk, PT Lion Metal Works Tbk, and PT Sepatu Bata, will have no long-term debt with interest in a given year.

4.2 Output discussion

This study utilizes six regression models, the details of which are summarized in Table 2 below:

Tabel 2. Path Analysis

Model	R square	Unstandardize β	Std Error	Sig	Result
Model 1 Y : STREET X1 : ICD X2 : TA X3 : TD X4 : LTD	0,189	0,131 0,535 -0,028 -0,295	0,082 0,067 0,027 0,051	0,112 0,000* 0,297 0,000*	Significant Significant
Model 2 Y : PBV X1 : STREET X2 : ICD X3 : TA X4 : TD X5 : LTD	0,441	6,713 1,052 2,339 0,860 -0,092	0,471 0,767 0,672 0,250 0,496	0,000* 0,171 0,001* 0,001* 0,853	Significant Significant Significant
Model 3 Y : STREET X1 : CVD X2 : TA X3 : TD X4 : LTD	0,188	0,140 0,525 -0,026 -0,292	0,108 0,068 0,027 0,052	0,199 0,000* 0,335 0,000*	Significant Significant
Model 4 Y : PBV X1 : STREET; X2 : CVD X3 : TA X4 : TD X5 : LTD	0,447	6,689 2,495 2,117 0,894 -0,003	0,467 1,000 0,675 0,249 0,495	0,000* 0,013 0,002* 0,000* 0,995	Significant Significant Significant Significant
Model 5 Y : STREET X1 : RND X2 : TA X3 : TD X4 : LTD	0,223	0,187 0,479 -0,010 -0,301	0,041 0,067 0,027 0,050	0,000* 0,000* 0,722 0,000*	Significant Significant Significant
Model 6 Y : PBV X1 : STREET X2 : RND X3 : TA X4 : TD X5 : LTD	0,460	6,338 1,559 2,070 1,005 - 0,256	0,474 0,395 0,665 0,249 0,489	0,000* 0,000* 0,002* 0,000* 0,602	Significant Significant Significant Significant

4.2.1 Output discussion of model 1 and model 2

Models 1 and 2 are used to determine whether intellectual capital disclosure has a direct or indirect effect on firm value via street earnings, and is explained as follows:

- a. R square (R²) for model 1 is 0.189 (18.9%), while model 2 is 0.441 (44.1%), indicating that in model 1, street earnings are influenced by other factors by 81.1 percent, whereas in model 2, firm value is influenced by other factors by 55.9 percent.
- b. In models 1 and 2, intellectual capital disclosure does not affect street earnings or firm value, implying no direct or indirect effect of intellectual capital disclosure.
- c. Only long-term debt has a significant and positive effect on both street earnings and firm value in models 1 and 2.

4.2.2 Output discussion of model 3 and model 4

Models 3 and 4 are used to determine whether disclosing customer value has a direct or indirect effect on firm value via street earnings, and is explained as follows:

- a. R Square (R²) values for models 3 and 4 are 0.188 (18.8%) and 0.447 (44.7%), respectively, indicating that in model 3, street earnings are influenced by 81.2 percent of other factors, whereas in model 4, firm value is influenced by 55.3% of other factors.
- b. Customer value disclosure does not affect street earnings in model 3 but significantly and positively affects firm value in model 4.

4.2.3 Total assets and long-term debt significantly impact street earnings in model 3, whereas total assets and total debt have a significant impact on firm value in model 4.

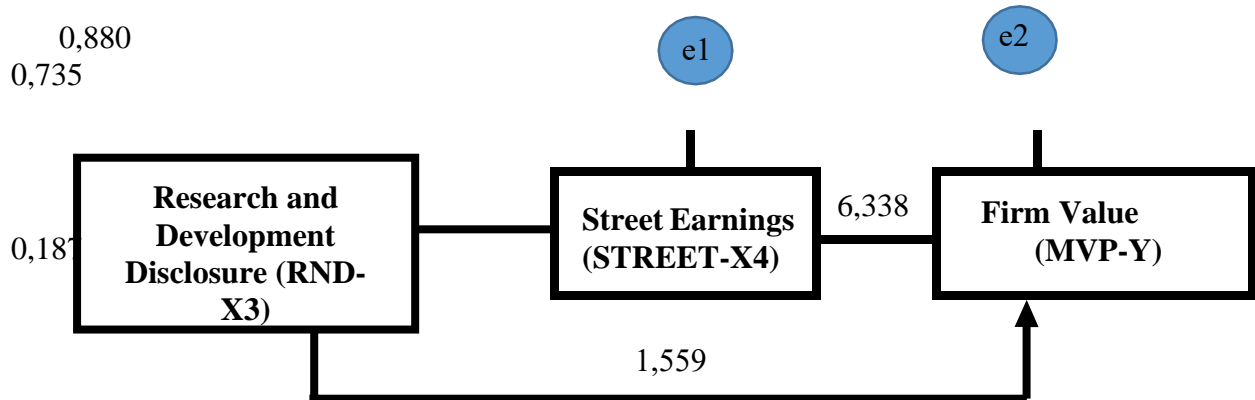
4.2.4 Output discussion of model 5 and model 6

Models 5 and 6 are used to determine whether research and development activities disclosure directly or indirectly affect firm value as measured by street earnings, and is explained as follows:

- a. R square (R²) in model 5 is 0.225 (22.5 %) and 0.460 (46.0 %) in model 6, indicating that 77.5 % of other factors influence the firm's earnings in model 5, while 54% of other factors influence firm value in model 6.
- b. Research and development activities (RND) have a significant and positive effect on street earnings and firm value in models 5 and 6.
- c. Only total assets have a significant and positive effect on street earnings and firm value in models 5 and 6.
- d. From the output of model 5, the R square (R²) was valued at 0.225, therefore the value of $e_1 = \sqrt{1 - 0,225} = 0,880$.
- e. The RND coefficient of model 5 was valued at 0.180.
- f. The output of model 6 indicates that the value of R square is 0.460, therefore the value of $e_2 = \sqrt{1 - 0,460} = 0,735$.
- g. In model 6 the RND and street earnings coefficient values are 1.506 and 6.345.
- h. The entire discussion of models 5 and 6 demonstrates the path diagram in Figure 2's results. The path analysis results also indicate that disclosing development research can potentially affect street earnings and, indirectly, firm value via street earnings.

Direct influence	: 1,559
Indirect influence	: 0,187 x 6,338 = 1,185206
Total influence	: 1,559 + 1,185 = 2,744

Figure 2. Path analysis model results



4.3 Pengujian sobel test Sobel test

Calculations for the Sobel test are performed using the Sobel Test calculator application (Preacher & Leonardelli, 2021). The following are the findings:

Gambar 1. Hasil kalkulator Sobel Test Figure 1. Sobel Test calculator results

Input:		Test statistic:	Std. Error:	p-value:
a	0.187	Sobel test: 4.31675591	0.27455942	0.00001583
b	6.338	Aroian test: 4.30598255	0.27524635	0.00001662
s _a	0.041	Goodman test: 4.32761054	0.27387076	0.00001507
s _b	0.474	Reset all	Calculate	

The p-value 0.00001583 calculated by the Sobel test calculator is less than 0.05, indicating that street earnings can mediate the relationship between disclosure research and development and firm value.

4.4 Hypothesis testing

On the basis of the hypothesis, the path analysis results in Table 2, and the Sobel test, the following conclusions are reached:

1. There is no effect of intellectual capital disclosure on street earnings (p-value 0.112 > 0.05) or firm value (p-value 0.171 > 0.05). Additionally, because the independent variable does not affect the intervening or dependent variables, **hypothesis 1 is rejected**.
2. Customer value disclosure has no effect on street earnings (p-value 0.199 > 0.05), but has a significant effect on firm value (p-value 0.000 0.05). This result also establishes that street earnings are incapable of mediating customer and firm value disclosure, as the independent variable affects only the dependent variable, **thus rejecting hypothesis 2**.
3. Disclosure of research and development has a significant and positive effect on street earnings (p-value 0.0000.05) and firm value (p-value 0.0000.05). With a p-value of 0.000015830.05, the Sobel test demonstrates that street earnings can mediate the relationship between research development disclosure and firm value, indicating that **hypothesis 3 is accepted**.

This finding is consistent with previous research, which indicates that research and development activities cause analysts to revise the value of street earnings due to the presence of critical information (Ho et al., 2007), as well as provide information to investors, thereby increasing firm value (Nekhili et al., 2016).

4. In all three proposed models, street earnings have a significant positive effect on firm value. This demonstrates that street earnings are informative (Bhattacharya et al., 2003), predictive (Barth et al., 2012), and have been shown in previous studies to be suitable for determining firm value (Bradshaw & Sloan, 2002).

5. Firm size has a significant positive effect on street earnings and firm value in the six models above.

4.5 Discussion

Six noteworthy points to discuss were discovered as a result of statistical calculations using regression and Sobel test testing. Firstly is the topic of street earnings; the findings of this study indicate that each regression model of street earnings has a significant and positive effect on firm value. This demonstrates that previous studies assert that street earnings should affect firm value due to their superiority. This advantage is obtained because street earnings are calculated without non-recurring items, which are deemed irrelevant.

Article III. Second, customer value. Although this variable does not affect street earnings, it does affect firm value, indicating that investor or potential investor looking for firm which able to meet customer expectations. The average percentage of disclosures of 4.6% also indicates that the company's disclosures are not optimized.

Third, research and development. Although disclosure accounts for only 6.8% of total revenue, it has a significant and beneficial effect on analysts and investors. Analysts believe that this variable affects the company's future sustainability, particularly service and product innovation. The descriptive statistics indicate that most disclosures are made by pharmaceutical companies, where research and development are critical to the industry's future success. Investors, too, view things similarly. When purchasing shares, consideration is given to the research and development of pharmaceuticals and similar products. The more research and development disclosed the more attractive this company is to investors, resulting in continued share price growth.

Fourth, the ability of street earnings as a mediator. This capability bolsters an analyst's role as an intermediary, specifically between a company and investors. All research and development disclosures benefit analysts by increasing street earnings and benefit investors by increasing firm value. When it comes to descriptive data, analysts and investors are mainly focused on the pharmaceutical industry.

Fifth, customer value. From the three examples of companies with the highest value (24.3%), it is clear that customer value affects the value of the company in industries where products or services are directly received by final consumers, such as the pharmaceutical industry (PT Indofarma Tbk) and the final consumption industry (PT Astra Otoparts Tbk and PT Multi Bintang Indonesia Tbk). On the other hand, companies whose services or products do not directly benefit end consumers, such as the palm oil processing industry, are less likely to publish customer value (PT Sawit Sumbermas Sarana Tbk).

Sixth, the presence of non-recurring items. Non-recurring items are variables that analysts disregard. This study demonstrates that by excluding non-recurring items from the

earnings calculation, street earnings can also affect firm value by capturing non-financial information, specifically research and development

5. Conclusions, limitations and suggestions

5.1 Conclusion

Two significant findings emerge from this study. First, the role of the analyst as an intermediary. The analyst acts as a third party who can provide information about the state of a company apart from the manager. Analysts can capture non-financial information conveyed in the annual report through street earnings, even if it is only through research and development variables. This research and development information also affects the company's value, as investors and potential investors obtain the same information directly from analysts or indirectly through the disclosure of annual reports.

Second, the exclusion of non-recurring items from the earnings calculation satisfies the previous study's expectations. Additionally, by excluding non-recurring items, these earnings can capture non-financial information about the business.

5.2 Limitations

Additionally, the study's findings have limitations. Research and development activities; the activities disclosed in the annual report do not accurately reflect the current situation. The disclosures made are limited to only five categories. While there are additional categories, researchers anticipate the company will not report them all because they pertain to trade secrets

5.3 Suggestions

Given the existing constraints, additional research could be conducted to compare the disclosure of development research activities to research and development costs. The objective is to ascertain whether research and development activities have a material impact on the company's value.

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