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TIME-SERIES CROSS-SECTION ANALYSIS OF THE EFFECT OF INTELLECTUAL CAPITAL DISCLOSURE ON MARKET VALUE OF LISTED FIRMS IN NIGERIA

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Abstract:

The aim of this study is to examine the impact of intellectual capital (IC) disclosure on market value of listed firms on main board of Nigerian Stock Exchange. This study applies the signalling theory in formulating hypothesis that guides the result analysis. Using content analysis of sampled 30 most capitalised firms, the study generates IC disclosure scores from annual reports. IC is surrogated with human capital, process capital, customer capital, innovation capital and protected capital while the study adopted market capitalization as a proxy of corporate market value. Using ordinary least square method, this study longitudinally examined the relationship between quality of IC disclosure and market capitalization using data over the period of 2011 to 2012 financial years. The result shows a significant positive association between overall IC disclosure and corporate market value of listed firms in Nigeria. Hence, the study recommends that management should be concerned with the adequate disclosure of IC related information as it affects the capital market activities and investors investment decisions.

Keywords: *Voluntary disclosure, Intellectual capital, corporate market value, Nigeria.*

1. Introduction

Science and technology have brought innovations into the economic and business environments (Bontis, 1996; Bounfour, 2003; Brooking, 1996). Hence, the organisational procedures and processes have change in recently due to embedded intangible assets that has been characterised as IC (e.g. Pulic, 2000; Stewart, 1991). Efficiency utilisation and subsequent disclosure of IC information firms' annual reports, have become common research area globally among academia and practitioners in in the field of accounting (e.g. Mangena, Pike, & Li, 2010; Mouritsen, Bukh, & Marr, 2004; Orens, Aerts, & Lybaert, 2009). The importance of IC, which fail to meet up the recognition yardsticks of international accounting frameworks and standards (M'Pherson & Pike, 2001) cannot be over emphasised as its non-inclusion in main stream of financial statements as either asset or capital has led to huge differences between the corporate market and book value (e.g. Pulic, 2000; Stewart, 1991).

Further, earlier studies have classified IC into three components, namely, human capital, structural capital and relational capital (e.g., Bontis, 1996; Bounfour, 2003; Brooking, 1996; Edvinsson & Malone, 1997; Marr & Chatzkel, 2004). Human capital includes the competence, skill, experience, and intellectual abilities of the individual employees (Bounfour, 2002; Edvinsson & Malone, 1997; Roos, Roos, Dragonetti, & Edvinsson, 1997; Stewart, 1997).Customer (relational) capital which is transitional kind of IC make up knowledge in group and networks of knowledge resources embedded within and derived from a link of relationship (Edvinsson & Malone, 1997; Roos et al., 1997; Stewart, 1997). Structural capital simply consists of processes, methods, brands, intellectual property structure and other intangibles owned by the entity but hidden in the statement of financial position (Bounfour, 2002; Brooking, 1996; Edvinsson & Malone, 1997; Stewart, 1997).

Meanwhile, while elements of human and relational capitals could easily be understood, there is ambiguity in what constitute the structural capital. Thus, after a critical examination of existing literature and the economic environment of Nigeria, the present study further evaluates structure capital and proposes its decomposition into three elements via innovation capital (e.g., Bontis, Dragonetti, Jacobsen, & Roos, 1999; Edvinsson & Malone, 1997; Joia, 2000), protected capital otherwise known as intellectual property (e.g., Brooking, 1996; Edvinsson

& Malone, 1997; Lynn, 1998) and process capital (e.g., Hsu & Fang, 2009; Stewart, 1997) in order to provide a lead way for scientific framework which is still major concern in IC accounting research. Innovation capital is considering as a direct consequence of a firm's culture and its capacity of creating new knowledge from existing one (Chang, 2007; Joia, 2000). According to Brooking (1996), intellectual property is lawful means for safeguarding enterprise infrastructure assets. Therefore, intellectual assets that are covered with legal protection are called protected capital. Process capital is defined as workflow, operation processes, specific methods, business development plans, information technology systems, cooperative culture, etc. within the business organizations (Hsu & Fang, 2009).

In addition, corporate value has been the concern of various stakeholders as it impacts not only on present decision making but also the future estimation in financing and investing decisions (Keeney & Keeney, 2009). Corporate market value has been estimated by market capitalisation (e.g. Abdolmohammadi, 2005; Anam, Fatima, & Majdi, 2011) as its reliability can be assumed they are free from manipulation of those charged of corporate management. Meanwhile, Abhayawansa and Abeysekera (2008) posit that corporate market value can be improved by disclosure of intellectual capital as this will ensure capital market efficiency and improve information symmetry between managers and investors and as well facilitate better corporate governance (Abeysekera, 2008) as it may signal future direction of the firms to the users as opined by signalling theory (Morris, 1987). The theory states that the information content of annual reports signal the direction to the users concerning the firm's future and guides their decisions. Hence, this can therefore explain the relationship between intellectual capital reporting and corporate value as the management of an entity with good value will try to signal this fact by disclosing more IC information in the annual reports to its stakeholders and this information might be captured by the market (Anam et al., 2011).

To sum it up, the current study will extend the literature to sub-Saharan Africa and particularly Nigeria by examining the impact of IC disclosure and its components: human capital disclosure, process capital disclosure, innovation capital disclosure, protected capital disclosure and process capital disclosure on the corporate market capitalisation of top 30 most capitalised firm in the country for three-year period of 2011 to 2103. This is the pioneer study to have considered such a relationship as previous studies have considered the trend of IC disclosure (Haji & Mubaraq, 2012; Mahamad & Salman, 2011), the impact of VAIC on

traditional accounting measures (Salman, Mansor, Babatunde, & Tayib, 2012; Uadiale & Uwuigbe, 2011) in the context of Nigeria economy.

However, the study established the significant positive relationship between IC disclosure and market capitalisation. The remaining part of the study is structured as follow: section two discussed literature review, theoretical framework and hypotheses development, section three considered methodology, while section four and five respectively captured the data analysis and conclusion of the study.

2. Literature review

This section discusses the underpinning theory of this study and critiques the existing empirical studies on the value relevance of IC disclosure. This enables the development of the conceptual framework that assisted in the formulation of the hypothesised relationship between IC disclosure and corporate market value.

2.1 Theoretical framework

The value relevance of IC information among the market participants has been considered using various theories. One of the most the celebrated theory of voluntary disclosure is signalling theory. Signalling theory is based on the premises that information asymmetry problem could minimise if the party possessing most information can transmit signals to other relevant stakeholders (An, Davey & Eggleton, 2011). The theory proposes that corporate entities with better performance or high quality firms would like to distinguish themselves from other low performing or low quality companies by sending signals to the market through voluntary disclosure and consequently minimising the information inequality (Watson, Shrives & Marston, 2002).

Signalling theory proposes that entities with better quality should signal their potential to the market as signalling would make market participants (e.g. investors) re-evaluate the worth of the firm and then make decisions more favourable to the company (Whiting & Miller, 2008). Similarly, the favour of these participants is expected to make a company obtain more investment and therefore reduce the costs of raising capital. Other researches on the subject (e.g. García-Meca, Parra, Larrán, & Martínez, 2005; Oliveira, Rodrigues, & Craig, 2006) also conclude that signalling fineness to the market could be a better motivating factor for corporate firms to communicate information related to IC, though the emphasis and format of reporting may differ in various companies.

**2.2   Literatures on Intellectual Capital Disclosure and Market
         Capitalisation**

Researches on the influence of ICD and corporate value have received a considerable attention among academia and some notable practitioners in recent time. The premises of most of these studies is signalling theory as it is expected that information contents of IC will change the opinion of the market participants regarding the present as well as of future performance of the business organisations (e.g. Gamerschlag, 2013; Ousama, Fatima & Hafiz, 2011; Vafaei, Taylor & Ahmed, 2011).

Also, Gamerschlag (2013) examines the effect of human capital disclosure on the corporate value of 130 largest quoted German firms for the time period of 2005 to 2009 using content analysis. The study utilised disclosure index to estimate HCD and employ share price and equity return as proxies for market value. Year and industry dummies were introduced as control variables. The study surrogates HCD by four items which include: HCRTOT is the total quantity of human capital disclosure; HCRQC is the amount of disclosed information with regard to "qualification/competence" issues; HCRMC is the amount of disclosed information with regard to "motivation/commitment" issues; and HCRPS is the amount of information provided on "personnel" issues (total number of keywords found in the analysed report). Closing price of the share and holding period return were estimated to proxy the market value of the entities sampled for the study.

Besides, Ousama et al. (2011) investigate the value relevant of IC information disclosure of listed firms in Malaysia utilised survey instrument to generate data from both the preparers and users of financial statements. The study employs internal capital, external capital and human capital as surrogates for IC and the questionnaire was administered among CFO and accountants of selected firms, broker institutions and banks' loan officers. The data collected were analysed using descriptive statistics, t-test and ANOVA. The study reveals that information content of IC are perceived to be value relevant to both preparers and users though as different degree. Vafaei et al. (2011) examine the extent in which disclosure of intellectual capital among firms is value-relevant in the capital markets. The study is cross national and comparative in which 220 firms were sampled from 4 countries of Singapore (50), Hong Kong (49), Australia (63) and Britain (58). ICD was measured by a disclosure index and word count in the content of firms' annual reports for each of four components (HC, SC, RC and general terms). The finding suggests a positive association of ICD to share price (value relevance) is affected by country-specific and industry-specific factors.

ICD is found to provide investors with value relevant information only in Britain and Australia and in the non-traditional industry sector.

In the same vein, Swartz, Swartz, and Firer (2006) for instance, examined JSE Securities Exchange (SA) using Ohlson's 1995 valuation model. The study indicated a significant relationship between that market capitalisation and intellectual capital reporting as surrogated by capital employed coefficient and the human capital coefficient. Also, Abdolmohammadi (2005) studied a sample of Fortune 500 in the USA and utilised aggregate value for ICD and documented that the information content of annual reports concerning IC affect corporate market capitalisation significantly. In the case of Vafaei et al. (2011) that measured the value relevance of ICD of the sample firms in Britain, Australia, Hong Kong and Singapore, can only document the positive significant impact on market value in two of the four countries.

The above shows that IC is not peculiar to some countries and it could be studied across firms. Also that finding might be influenced by the economic jurisdiction of the study. Thus, it would be interesting to explore the phenomenon in the context of Nigerian economy.

Based on the underpinning theory and the established association between voluntary disclosure and market capitalisation, the current study proposes the following conceptual framework. The dependent variable is measured as market capitalisation while independent variable is IC disclosure made of human capital disclosure, relational capital disclosure, structural capital disclosure, innovation capital disclosure and protective capital disclosure. Also, included in the framework are control variables which are considered relevant in explaining the dependent variables. These are size of the firms and industry affiliation.
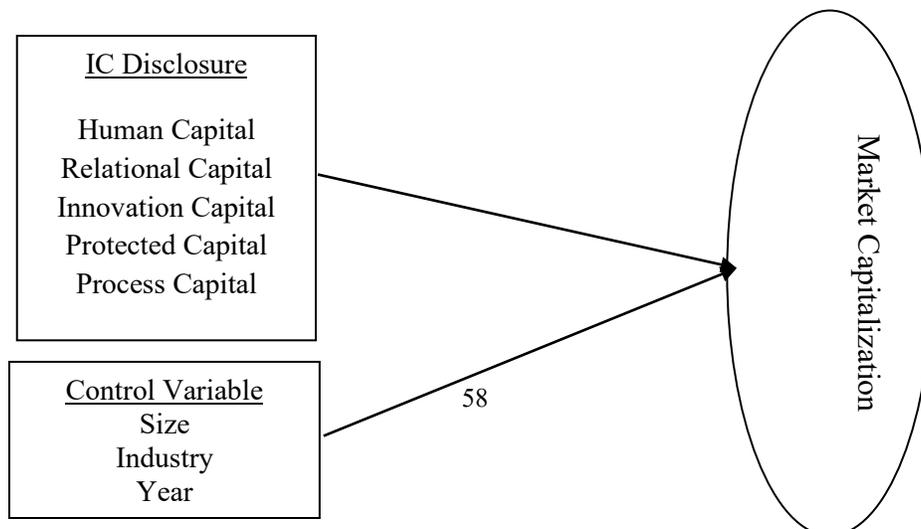

Figure 1: Conceptual framework utilized in the study

2.4 Hypotheses development

Based on the underpinning theory and the existing empirical studies, this section presents the hypothesis of the study. The research question is whether, based on signalling theory, IC disclosure has any significant impact on a firm's market capitalization. Several studies have considered the impact of IC disclosure on market capitalization. For example, Anam et al. (2011) and Abdolmohammadi (2005) found that ICD has a significant positive effect on market capitalization. Anam et al. (2011) analyzed Malaysian firms, while Abdolmohammadi (2005) studied a sample of Fortune 500 in the USA. In line with these findings, the present study hypothesizes as follows:

H1:   Intellectual capital disclosure has significant positive impact on the market capitalization of listed firms in Nigeria.

3. Methodology

The study sampled the top 30 firms in country based on the market capitalisation on the floor of NSE. The firms are those consistently fall within the 30 most capitalised firms over the period 2011-2013. Though, their positions changes but they were with the criteria. The study utilised data mainly from secondary sources because the core of the data needed for analysis was adequately and authoritatively extracted from the annual report and accounts of the sample firms and other relevant publications issued by the Nigeria Stock Exchange

3.1 Measurement of IC disclosure

Following the review of prior studies, the present study employs content analysis to develop a checklist after familiarization with the pattern of IC disclosure. The 49 selected items of IC are comprised of 16 human capital, 9 process capital, 6 innovation capital, 5 protected capital and 13 relational capital items. Table I displays the details of each categorization's items.

Table I: Checklist list of IC Disclosure Items

A	Human Capital	C	Customer/Relational Capital
1	Number of Employees	1	List of Customers
2	Employee satisfaction	2	Customer satisfaction
3	Employee retention	3	Customers loyalty
4	Compensation to employees	4	Customer Appreciation
5	Engagements with employees	5	Customer retention
6	Recruitment from the local communities	6	Customer service/support
7	Disability recruitment policy (number)	7	Customer feedback system
8	Employee Know-how	8	Distribution channels
9	Education Background	9	Customer Market Share
10	Employee succession planning program	10	Company awards
11	Work-related knowledge	11	Company image/ reputation
12	Knowledge sharing	12	Customer training & education
13	Employee health and safety	13	Diffusion & networking
14	Employee Expertise	D	Innovation Capital
15	Training and development	1	Innovation
16	Cultural Diversity	2	Research and Development
B	Process Capital	3	Brands
1	Corporate Culture	4	Knowledge-based
2	Information Systems (Technology)	5	Research collaboration
3	Financial Relations	6	Goodwill
4	Business Collaboration	E	Protected Capital
5	Favourable contracts	1	Patent
6	Organisation flexibility	2	Copyright
7	Organisation structure	3	Trademarks
8	Organisation learning	4	Licenses
9	Quality management	5	Commercial rights

A scoring measure on a Likert scale of four (0-3) was considered in order to measure the quality of IC disclosure (e.g., Abeysekera, 2008; Guthrie et al., 2006). Following Haji and Ghazali (2012), a score of 3 was given if the items were disclosed in terms of Naira, the Nigerian unit of currency; a value 2 was given if the items were disclosed in numerical form; a value of 1 was given if the item appeared in narrative form, and a value of 0 was given if the item did not appear in the annual report. Thus, Thus, the total scores for overall disclosure and each of components (TXS) were computed as the proportion of actual score (AXS) to maximum possible score (MXS) (i.e. 3X 49 =147). The TXS of a company is obtained by:

$$TXS = \frac{AXS}{MXS}$$

Validity and reliability of the scores have been a source of concern in intellectual capital disclosure in recent times due to inherent problems associated with the approach. To overcome this, the present study carried out a two-stage checklist scoring approach. The authors began with pilot scoring using the top ten listed corporate entities in order to create familiarization with the annual reports. They then scored the sampled annual reports independently and compared their scores. The areas of difference were then rescored jointly to correct the discrepancies.

3.2 Data Analysis Methods

The study commences analyses with description of data to confirm the normality of the series and this is followed by Pearson Correlation Matrix in order to evaluate the possibility of multicollinearity among independent variables (e.g., Field, 2013; Hinton et al. 2004). Due to the nature of data and finding from these preliminary analyses, the study estimates the parameters with ordinary least square method (e.g., Field, 2013; Hinton et al. 2004). Thus, the estimations were made based on stochastic models as follows:

Eqn1
$$MKcap_{it} = \gamma_0 + \gamma_2 \sum_{i=1}^{5} TICD_{it} + \gamma_3 Industry_{it} + \gamma_4 Size_{it} + \gamma_5 Year_{it} + \varepsilon_{it}$$

Eqn 2
$$MKcap_{it} = \delta_0 + \delta_2 HC_{it} + \delta_3 EC_{it} + \delta_4 INC_{it} + \delta_5 PC_{it} + \delta_6 PRC_{it} + \delta_7 Industry_{it} + \delta_8 Size_{it} + \delta_9 Year_{it} + \varepsilon_{it}$$

Equation 1 and equation2 was used to estimate the impact of Overall IC disclosure, and individual components on market capitalization, respectively. The details definition, measurements and sources of acronyms utilized in the models are presented in Table III

Table II: Details of Variables

Symbol	Definition	Measurement	Sources
Log_MK	Natural log of market capitalization	Product of year end stock price and nu of share ranking for dividend	NSE Website
HC	Weighted human capital disclosure	Ratio of actual to maximum possible score of HC	Annual report
EC	Weighted Relational capital disclosure	Ratio of actual to maximum possible score of RC	Annual report
INC	Weighted Innovation capital disclosure	Ratio of actual to maximum possible score of INC	Annual report
PC	Weighted Process capital disclosure	Ratio of actual to maximum possible score of PC	Annual report
PRC	Weighted Protected capital disclosure	Ratio of actual to maximum possible score of PRC	Annual report
TICD	Weighted Overall Intellectual capital disclosure	Ratio of actual score to maximum possible score Overall IC	Annual report
Industry	Categories firms along financial and non-financial line	1 for financial firm and 0 for non-financial	NSE Website/Annual reports
Size	Size of the sampled firms	Log of total assets	NSE Website/ Annual reports
Year	Year Dummy	Dummy variable for year of study	

4. Results and Findings

4.1   Descriptive Statistics

The analysis begins with the description of data in order to establish their suitability for further estimations. The results of descriptive statistics reveal that about 43.6% of the overall disclosure items was disclosed by the firm on the average. Also, human capital was most disclosed among the five components with average of 46.3% of the expected disclosure. This is closely followed by process capital with mean of 45.3%. While protected capital has least of disclosure. The result also shows that median values of all the variables fall between their means and maximum values. This is an indication of normality as this proof the variable to mesocurtic shapes in their probability distributions. Besides, the variables were moderately normally distributed based on skewness and kurtosis criterion (e.g. Field, 2013; Wooldridge, 2010). It can be drawn from the above that parameters could be estimated with ordinary least square method.

Table III: Result of Descriptive Statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Ob
LOG_MK	11.30	11.250	13.104	9.780	0.675	0.455	3.783	90
TICD	0.436	0.422	0.687	0.238	0.098	0.324	2.642	90
SIZE	10.58	10.627	11.740	7.280	0.809	-1.445	6.938	90
HC	0.463	0.458	0.625	0.250	0.091	-0.216	2.486	90
EC	0.443	0.410	0.795	0.051	0.164	0.197	2.577	90
PC	0.453	0.444	0.778	0.148	0.116	0.386	3.417	90
PRC	0.340	0.333	0.600	0.067	0.087	0.323	5.548	90
INC	0.408	0.389	0.889	0.000	0.148	0.827	4.783	90

4.2 Summary of Pearson Correlations Coefficient Matrix

Table III presents the results of correlation matrix. The results indicate absence of perfect multicollinearity among the variables as all figures are within acceptable region based on the submissions of Field (2013) and Gujarati and Porter (2009). The correlation coefficient across the pair is lower than 0.5 except in the case of TICD and its constituents which are not to be regressed together in the same model. This signifies non-awfulness or non-presence of collinearity problems among the independent variables. To examine the relationship between the dependent and independent variables, a correlation analysis is considered and the results are presented in Table III. It can be deduced that market capitalisation is positively significantly correlated with the all intellectual capital components.

This could provide better basis for further analysis using regression method of estimation.

Table IV: Coefficient of Correlation Result

	Log_MK	TICD	HC	EC	PC	InC	PrC	Size
Log_MK	1							
TICD	.436**	1						
HC	.226*	.885**	1					
EC	.454**	.912**	.716**	1				
PC	.351**	.906**	.755**	.767**	1			
InC	.431**	.662**	.413**	.532**	.597**	1		
PrC	.261*	.459**	.383**	.276**	.447**	.288**	1	
Size	.418**	.235*	.151	.230*	.278**	.179	.054	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

4.3   Regression Result of Intellectual Capital Disclosure and Market Capitalization

The impact of IC disclosure on the corporate market value of listed firms in Nigeria is the main objective of this study. The hypothesised relationship was tested with the aggregated model (i.e. equation). The results of the model1 indicate that overall disclosure has significant positive impact on the market capitalisation of listed firms in Nigeria. The possible implication of this finding is that more disclosure would enhance the market value. This finding is consistent with earlier studies (e.g., Abdolmohammadi, 2005; Anam et al., 2011). However, form individual components perspectives, external capital, innovation capital and protected capital have positive significant effect on the market value of listed firms in Nigeria. The result also reveals unexpected significant negative influence of human capital and process capital on corporate market value measure by market capitalisation. In addition, firm's size has significant effective with corporate value and the finding is in line with that of Anam et al. (2011).

Besides, both the year effect and industry effect have negative significant impact on corporate market value during the period under study in the two models. This could be said that industry and year do not necessary in the IC disclosure in the context of Nigeria. The overall variation in market value is explained by IC disclosure to the extent of 71.2% on the aggregate and 83.2% on individual

component model, as reveals by the adjusted R-square and F-statistic reveals that fitness of the model (F-statistic, 44.54, P<0.01 for model 1 and F-statistics, 49.58, P<0.01 for model II) with value of 44. The details of summaries from the estimation are presented in the Table IV. The autocorrelation seems not to serious problem with values of DW from the both models which is approaching 1 as suggested by earlier studies (e.g. Field, 2013; Wooldridge, 2010).

Table V: Intellectual capital disclosure and market capitalisation

Variable	Model 1				Model 2			
	Coefficient	Std. Error	t-Stat	Prob.	Coefficient	Std. Error	t-Stat	Prob.
TICD	1.935	0.245	7.915	0.000				
HC					-0.854	0.209	-4.094	0.000
EC					1.825	0.300	6.087	0.000
INC					0.589	0.086	6.861	0.000
PRC					1.216	0.111	10.967	0.000
PC					-0.549	0.244	-2.251	0.027
SIZE	0.496	0.068	7.291	0.000	0.391	0.043	9.135	0.000
FIN	-0.395	0.030	-13.197	0.000	-0.315	0.032	-9.753	0.000
YEAR1	-0.114	0.014	-8.415	0.000	-0.075	0.010	-7.521	0.000
YEAR2	-0.091	0.003	-26.764	0.000	-0.053	0.004	-13.174	0.000
C	5.125	0.615	8.333	0.000	6.242	0.426	14.666	0.000
R^2	0.729				0.850			
Adj.R^2	0.712				0.832			
F-value	44.543				49.589			
Prob.	0.000				0.000			
DW	0.936				0.997			

5. Conclusion and Recommendations

The study aims to examine the potential impact of IC disclosure on the corporate market value surrogated by market capitalisation which was measure by product of end year share price and number of share ranking for dividend. The study adopted content analysis of the top 30 listed companies on the floor of Nigerian stock exchange over 2011-2013 financial years. IC was classified along human capital, innovation capital, protected capital, external capital and process capital. Overall IC disclosure and innovation, external capital and protected capital disclosure have significant positive impact on market value of listed firms in Nigeria. This mean the more these are disclosed, the better the market value of

firms. Contrary to expectation, human and process capital disclosure reveal negative impact on the market value which suggests that these components are not necessarily valued by Nigeria investors.

From a practical perspective it is expected that "those charged with governance" should be concerned with the disclosure of IC information in the financial statements as IC information is value relevant to the investors. However, this is subject to certain limitations, which could present an opportunity for future research to extend this study. First, this study's sample comprises the top 30 listed firms listed on the main board of Nigeria Stock Exchange, Hence, generalization of the results to smaller firms. Future research could further investigate empirically whether the results can be generalized to all the listed firms regardless of their sizes.

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