PAPER NAME

2024_IJLIC-118596_TAV_Online_First_Article_DOI_Blm_R.pdf

AUTHOR

Harmono Harmono

WORD COUNT

9005 Words

CHARACTER COUNT

47625 Characters

PAGE COUNT

26 Pages

FILE SIZE

675.5KB

SUBMISSION DATE

Oct 6, 2024 2:19 PM GMT+7

REPORT DATE

Oct 6, 2024 2:21 PM GMT+7

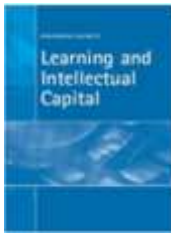
17% Overall Similarity

The combined total of all matches, including overlapping sources, for each database.

- 13% Internet database
- 13% Publications database
- Crossref database
- Crossref Posted Content database
- 0% Submitted Works database

Excluded from Similarity Report

- Bibliographic material
- Manually excluded text blocks



International Journal of Learning and Intellectual Capital

ISSN online: 1479-4861 - ISSN print: 1479-4853
https://www.inderscience.com/ijlic

Editorial: Insights on knowledge management and intellectual capital for a greener and digital future

Patricia Ordóñez de Pablos

Article History:
Received: 14 July 2022
Accepted: 26 April 2024
Published online: 4 October 2024

Manuscript link in press:
https://www.inderscience.com/info/ingeneral/forthcoming.php?jcode=ijlic

Information content disclosure of VAIC: influence on firm value through firm performance and leverage

Harmono*

Department of Accounting,
Faculty of Economics and Business,
University of Merdeka Malang (Unmer Malang), Indonesia
Email: harmono@unmer.ac.id
Orcid ID: https://orcid.org/0000-0002-1933-5017
*Corresponding author

Ika Insyiroh

Faculty of Islamic Economics and Business,
State Islamic Institute (IAIN) Kediri, Indonesia
Email: insyirohika@gmail.com

Abstract: The purpose of this study is to investigate the information content disclosure of VAIC influence on firm value through firm performance, and leverage, to obtain a robust integrated model that can reveal the information content of intellectual capital. The research population is 709 companies listed on the Indonesian capital market. Using purposive sampling, 159 manufacturing companies were identified from 2017 to 2019, with N = 507 observations, by using path analysis and panel regressions. The research finding is a robust integrated model in which capital employee efficiency (CEE) and human capital efficiency (HCE) affect firm value when using (Tobin's Q) fully mediated through firm performance (ROI) and leverage (DER). The results obtained highlight the importance of the integrated model that places firm performance (ROI) and leverage as an intervening variable between the information content of VAIC and its effect on firm value, become a model for disclosing the information content of multidimensional intellectual capital.

Keywords: intellectual capital; VAIC; financial performance; leverage; firm value.

DOI: 10.1504/IJLIC.2024.10067007

Reference to this paper should be made as follows: Harmono and Insyiroh, I. (2024) 'Information content disclosure of VAIC: influence on firm value through firm performance and leverage', *Int. J. Learning and Intellectual Capital*, Vol. 21, No. 4 Y, 2024 pp.xxx–xxx.

Biographical notes: Harmono is an Associate Professor as a Lecturer and senior researcher in Economics, Financial Accounting and Capital Market Investment at the University of Merdeka Malang, Indonesia. He is also a reviewer of the *Journal of Intellectual Capital*, and a reviewer of *Expertise Journal of Finance and Bank*.

Ika Insyiroh is a Lecturer in the Faculty of Sharia Economics, Islamic high school of KH. Zainuudin Ponpes Mojosari Nganjuk and a Employee in State Islamic Institute (IAIN) Kediri, Indonesia. She is junior researcher in Economics and Financial Management. She is a manager of the journal murabahah, the journal of Canonia, and the Journal of QOF.

1 Introduction

Information content of intellectual capital and firm performance is an important factor for investors and creditors as a basis for making investment decisions in the capital market, and for managers who will borrow capital, and in improving the efficiency and effectiveness of the company operation to achieve economic value-added, especially sales and earnings target. The relationship between the investors and creditors with management is a manifestation of the implementation of agency theory, signalling theory, optimum capital structure theory, or tax driven theory (Jensen and Meckling, 1976; Connelly et al., 2011; Modigliani and Miller, 1963; Harmono et al., 2023).

Dealing with the results of previous studies related to intellectual capital using the measurement of value-added intellectual capital (VAIC) components including capital employee efficiency (CEE), human capital efficiency (HCE), and structural capital efficiency (SCE) with firm value using Tobin's Q, PER, and PBV measurements showed contradictory results (Pulić, 2008; Xu and Liditinos et al., 2011; Singla, 2020; Smriti and Das, 2018; Soewarno and Tjahjadi, 2020; Smriti and Das, 2018; Kim et al., 2011; Stahle et al., 2011)

On the other hand, several studies that analyse intellectual capital with firm performance using measurements of return on investment (ROI), return on assets (ROA), return on equity (ROE), growth, EPS, and firm productivity using asset turnover (ATO) showed inconsistent results (Rehman *et al.*, 2011; Gupta and Raman, 2021; Cheng et al., 2010; Alipour, 2012; Riahi-Belkaoui, 2003; Chen et al., 2005; Pulić, 2008; Iazzolino and Laise, 2013; Maji and Goswami, 2020 ;Hoang H.T at al 2020;Vale et al., 2022).

There are still few studies that have analysed the relationship between intellectual capital and leverage. Liu and Wong (2011) examining the effect of stock patents data, research and development on funding decisions (market leverage) shows a significant positive, and negatively with book leverage. Kim et al. (2011) examines technological innovation on firm value mediated by leverage as empirical evidence from Korea, the results indicate that the technological innovation has a positive effect on firm value, but negatively through the mediating variable of leverage.

Based on previous researches, there is still a gap between the results of research examining the relationship between intellectual capital and firm value (Tobin'sQ, PBV and PER), and intellectual capital (VAIC components with firm performance (ROI, ROA and ROE) that the model still shows not robust, 2019; Maji and Goswami, 2020; Vale et al., 2022; Hoang et al., 2020), Therefore, the research motivation is to develop a robust integrated model, using sensitivity analysis by placing control variables size and interest on the relationship between intellectual capital using measurements (CEE, HCE, SCE) and firm value (Tobin's Q, PER and PBV) through firm performance with measurements (ROI, ROA and ROE) and leverage (DER) that is able to reveal the information content of intellectual

capital referring to the research model (Kim et al., 2011; Liu and Wong, 2011; Stahle et al., 2011; Bassetti et al., 2019; Modigliani and Miller, 1958, 1963).

Pulic's VAIC model is still relevant as the basis for disclosing the information content of intellectual capital, as it fundamentally reflects the creation of human capital, supported by physical capital, and is able to accommodate all intellectual capital value creations. However, it must be noted that there are limitations to specific measurements that have been developed, including those related to relational capital, technological innovation, intangible assets, research and development, marketing strategy, and the measurement of other intellectual models. This view is in line with the insights from 21 years of research and development in theory and practice (Edvinsson, 2013; Liu and Wong, 2011; Edvinsson et al., 2022;; Ordóñez de Pablos, 2023).

Based on the gap between previous studies, this study develops a robust integrated model, namely information content disclosure of VAIC: influence on firm value through financial performance and leverage. The writing organisation of this paper is as follows:

1 introduction

2 literature review and hypotheses development.

3 methodology supported robustness checks

4 empirical results and discussion

5 finally, conclusions and implication.

2 Literature review and hypothesis

2.1 Relationship between intellectual capital and firm performance

The description of VAIC in Pulić (2000, 2004, 2008) model has fundamentally contributed to measuring intellectual capital efficiency (ICE). Another view, the research focuses on the multidimensional analysis of intellectual capital, including concepts such as the balanced scorecard, Skandia navigator, intellectual capital index and capital tree, and intellectual capital framework (Kaplan and Norton, 1992;; Sveiby, 1997; Rossi and Polcini, 2018).

This research focuses on developing the VAIC information content disclosure model effects on firm value through the role of the mediating variable of financial performance (ROI) and capital structure (DER). This can serve as a fundamental basis for further research and help uncover intellectual capital behaviour patterns to discuss the components of the VAIC concerning the dimensions of firm performance, leverage and firm value. Referring to the propositions of Pulić (2004) and Iazzolino and Laise (2013), VAIC can be calculated as follow:

$$VA = OUT - IN$$

OUT = total sales and *IN* = cost.

Value-added can be determined as follows:

$$VA = OP + EC + D + A$$

where OP = operating profit, EC = employee costs, D = depreciation and A = amortisation. According to Pulić (2000), factor capital depends on human capital in creating the added value of a company. $VA = HC + SC$. Based on this equation, we can derive that $HCE = VA / HC$. In this case, HCE = human capital efficiency coefficient and HC = salary and wages. The calculation of SCE can be done as follows: $SCE = SC / VA$ and $ICE = HCE + SCE$. In the Pulić model, the value-added cannot only be created by the human capital factor; of course, achieving a level of efficiency in the company's operations requires financial and physical capital as well. Therefore, a CEE coefficient is needed, which is calculated by $CEE = VA / CE$. In this case, CE = book value of assets, formulated as:

$$VAIC = HCE + SCE + CEE = \left(\frac{VA}{HC} + \frac{SC}{VA} + \frac{VA}{CE} \right).$$

Next,

$$VA = HC + SC \tag{1}$$

Dividing the two sides by VA is the same as:

$$1 = \frac{HC}{VA} + \frac{SC}{VA}$$

Then:

$$1 = \frac{1}{\frac{VA}{HC}} + \frac{SC}{VA} \tag{2}$$

By replacing:

$HCE = \frac{VA}{HC}$ HCE reflects labour productivity / salary and wage

$SCE = \frac{SC}{VA}$ structural capital efficiency0

Equation (2) becomes:

$$SCE = 1 - \frac{1}{HCE} \tag{3}$$

In equation (3), HCE shows the productivity of knowledge workers in creating value that requires physical capital support. The information content of intellectual capital disclosure has a relationship with financial performance (ROI). It is necessary to look at CEE related to physical performance and the human aspect. On the other hand, the behaviour of SC components is also a part of intellectual capital. The higher VA created by each knowledge worker in utilising physical capital (SC) to increase added value is a part of VA, which is formulated as follow:

$$\frac{\delta SCE}{\delta HCE} = \frac{1}{HCE^2} > 0 \tag{4}$$

Description of ICE:

Description	*Notation*
Sales	*OUT*
– Cost	*IN*
= VA	*VA*
– Salary and wages (human capital)	*HC*
= Structural capital (Ebitda / earnings before interest and tax, before depreciation and amortisation)	*SC*
– Depreciation and amortisation	*D + A*
= Operating profit	*OP*

1 If *HCE* = 1, or *SCE* = 0, then *VA* can only pay labour costs; this means no added value.

2 If *HCE* > 1 or *SCE* > 0 and then, there is value creation, and *VA* can exceed labour costs, assuming that the profit-oriented company must be in the *HCE* > 1 condition. However, in reality, if the condition 0 < *HCE* < 1, the company has not been able to generate added value (*VA* < *IC*) and cannot achieve a profit. Therefore, Pulić (2000) defines *ICE* as follows:

$$ICE = HCE + SCE \tag{5}$$

The relationship between *ICE* and *HCE* productivity can be calculated with equation (3) into equation (5), as follows:

$$SCE = 1 - \frac{1}{HCE}$$
$$ICE = HCE + SCE = HCE + \left(1 - \frac{1}{HCE}\right). \tag{6}$$

Or the two sides are divided by their equal HCE form an equation

$$\frac{ICE}{HCE} = \frac{\left(HCE + \left(1 - \frac{1}{HCE}\right)\right)}{HCE}.$$

Or this can be simplified,

$$ICE = \frac{HCE^2 + HCE - 1}{HCE} \tag{7}$$

Based on equation (7), the equation of the linear function *ICE f*(*HCE*) can be derived as:

$$\frac{\delta ICE^{2}}{\delta HCE} = standardised\ coefficient = \sqrt{\frac{\sum_{t=0}^{i}(ICE-\overline{ICE})^{2}}{\sum_{t=0}^{i}(HCE-\overline{HCE})}} > 0 \quad (8)$$

Referring to equation (8), the *SCE* function concerning *ICE* can be derived as follows:

$$\frac{\delta ICE^{2}}{\delta SCE} = standardised\ correlation\ coefficient\ base = \sqrt{\frac{\sum_{t=0}^{i}(ICE-\overline{ICE})^{2}}{\sum_{t=0}^{i}(SCE-\overline{SCE})}} > 0 \quad (9)$$

Initially, in proposition Pulić (2000), there was no logical relationship between traditional financial performance *ROA* and *HCE*. The function of the equation, *ROA* = *f*(*HCE*), assumes $\frac{\delta ROA}{\delta HCE} > 0$. Referring to equation (8) is a misleading function, because *HCE* is an element of added value; to this extent, Pulić (2000) has contributed a meaningful intellectual capital proposition in measuring *VAIC* = {*VACA*, *VAHU*, *STVA*}, 3 ∈ *VAIC*. Pulić (2008), after considering various inputs, finally acknowledges that ICE disclosures develop in a multidimensional manner can be linked to traditional financial performance (Kaplan and Norton, 1992; Sveiby, 1997; Edvinsson, 1997; Lin and Edvinsson, 2008; Iazzolino and Laise, 2013; Liu and Wong, 2011).

The multidimensionality of intellectual capital can be explained based on Van Horne (1971) in principle, all organisational activities lead to a strategy of obtaining sources of funds both from debt and equity and allocated to company activities in working capital and investment activities of tangible fixed assets and intangible assets, and then these activities generate sales with various business strategies in which there are opportunities to create added value: customer-focused value creation; product efficiency and effectiveness; technological innovations; efficiency and effectiveness of human resource management; for tax-driven theory, all of this activity to attain the company's ability to obtain earnings will be more meaningful when compared to assets (ROI) (Van Horne, 1971).

Based on the optimal capital structure theory of Modigliani and Miller (1963); and the VAIC model (Pulić, 2000, 2004, 2008), as well as the views of modern financial management (Van Horne, 1971). The intellectual capital disclosure model can contribute to the mainstream research model disclosure in the multidimensional of intellectual capital. Research related to the IC looks at its effects on financial performance (Smriti and Das, 2018; Bontis et al., 2018; Sardo and Serrasqueiro, 2018; Tripathy et al., 2016; Bontis et al., 2018; Riahi-Belkaoui, 2003; Cheng et al., 2010; Zéghal and Maaloul, 2010; Alipour, 2012) and the relationship between IC with a capital structure (Liu and Wong, 2011).

Referring to the insights gained from 21 years of theory and practice (Edvinsson, 2013), the phenomenon of intellectual capital will become more multidimensional, and human capital can create value-added creations in the global economic system. Along with structural capital and relational capital within the concept of knowledge-sharing (Edvinsson, 2002; Vrontis et al., 2020; Tarsakoo and Charoensukmongkol, 2020).

Previous research, about multidimensional intellectual capital disclosure affecting financial performance shows inconsistent results (Singla, 2020; Javornik et al., 2012; Celenza and Rossi, 2014; Rossi and Celenza, 2013; Soewarno and Tjahjadi, 2020; Janoševic and Dženopoljać, 2012; Soriya, 2019). According to Bassetti et al. (2019), the relationship between VAIC component and firm performance is biased, caused by the interest factor. This study places interest and size variables as control variables, by testing the company performance measurement before deducting interest there is EBIT / assets (ROI) compared to those already deducting interest and taxes, namely ROA and ROE, concerning the VAIC component, to obtain a robust model. Based on a theoretical review and the previous research, the hypotheses are:

H1a There is an association between the 'value-added human capital coefficient' and financial performance measured using ROI, ROA, and ROE, with interest and firm size as control variables.

H1b There is a positive association between the 'value-added capital employed coefficient' and financial performance measured using ROI, ROA, and ROE, with interest and firm size as control variables.

H1c There is a positive association between 'value-added structural capital coefficient' and financial performance measured using ROI, ROA, and ROE, with interest and firm size as control variables.

2.2 Relationship between intellectual capital and leverage (DER)

Previous research that examines the relationship between intellectual capital and corporate funding strategy decisions as measured by leverage has not been widely investigated. Therefore, one of the novelties of research motivation has been the influence of intellectual capital on leverage (Liu and Wong, 2011; Kim et al., 2011; Tran et al., 2020).

In terms of optimal capital structure theory, it was first formulated by Modigliani and Miller (1958), who assumed that when there was no tax, the capital market was efficient with low transaction costs and market information was accessible, therefore weighted average cost of debt capital and equity capital became irrelevant to consider through optimal capital structure. Next, Miller (1963) corrected when there is tax, and the capital structure becomes relevant to consider in achieving the optimal weighted average cost of debt and equity capital (Fama, 1970; Modigliani and Miller, 1963; Jensen and Meckling, 1976).

Based on the theoretical review of the relationship between intellectual capital and leverage, we hypothesise that:

H2a There is an association between the 'value-added human capital coefficient' and leverage.

H2b There is a positive association between the 'value-added capital employed (physical and financial) coefficient' and leverage.

H2c There is a positive association between 'value-added structural capital coefficient' and leverage.

2.3 Relationship between intellectual capital, firm performance and leverage with firm value (Tobin's Q)

A series of studies on the relationship between the capital efficiency coefficient of intellectual capital with firm performance and firm value has been carried out (Pulić, 2000; Tran and Vo, 2018; Smriti and Das, 2018; Iazzolino and Laise, 2013). For value creation created by human capital, the company funding policy is measured using the optimal capital structure, proven by a robust model. Previous studies (Modigliani and Miller, 1958; Liu and Wong, 2011; Salvi et al., 2020; Frank and Goyal, 2003) have conducted tests on the pecking order theory on a large sample from 1971 to 1998, which shows that the model is not robust and contradictory. Although the company condition has a deficit in the long-term, the company continues to fund debt, for company managers who are creative and innovative will always create breakthroughs to increase sales and add value.

The measurement of intellectual capital using research and development costs and intellectual property rights related to technological innovation influence funding decisions (Liu and Wong, 2011). The measurement of firm value in several previous research using: return, Tobin's Q, PER and PBV (Vo and Ellis, 2017; Sharpe, 1964; Bouchaud et al., 2001; Riahi-Belkaoui, 2003). Based on previous research, we hypothesise:

H3a There is an association between the 'value-added human capital coefficient' and firm value measured by Tobin's Q, PER and PBV.

H3b There is a positive association between the 'value-added capital employed coefficient' and firm value measured using Tobin's Q, PER and PBV.

H3c There is a positive association between 'value-added structural capital coefficient' and firm value measured using Tobin's Q, PER and PBV.

H3d There is a positive association between 'firm performance' and firm value measured using Tobin's Q, PER and PBV.

H3e There is an association between 'leverage' and firm value measured using Tobin's Q, PER and PBV.

3 Methodology

3.1 Research design and sample selection

The research design is explanatory research that examines causality relationships using the formulation of hypotheses to see the relationship between the information content of VAIC influence on firm value through firm performance and leverage, with size and interest as a control variable. The data samples are manufacturing companies that went public in the Indonesian capital market. 159 companies were observed in four years the latest data available from 2017 to 2019, with 507 sample observations. Using path analysis techniques based on panel regression.

3.2 Dependent, independent and control variables measurement

Table 1: Variable definition

Variables	*Description*	*Measuring variables*
Dependent variables		
Firm performance (Y_1)		
Return on investment ($Y_{1.1}$)	ROI (Lag_ROI)	$\frac{\textit{Earnings before interest and tax}}{\textit{Assets}}$
Return on equity ($Y_{1.2}$)	ROE (Lag_ROE)	$\frac{\textit{Earnings after tax}}{\textit{Equity}}$
Return on assets ($Y_{1.3}$)	ROA (Lag_ROA)	$\frac{\textit{Earnings after tax}}{\textit{Assets}}$
Leverage (Y_2)	DER	$\frac{\textit{Debt}}{\textit{Equity}}$
Firm's value (Y_3)		
Tobin's Q ($Y_{3.1}$)	Tobin's Q (Lag_Tobin's Q)	$\frac{(\textit{Equity market value} + \textit{Liabilities market value})}{(\textit{Equity book value} + \textit{Liabilities market value})}$
Price earnings ratio ($Y_{3.2}$)	PER (Lag_PER)	$\frac{\textit{Price}}{\textit{Earnings per share}}$
Price to book value ($Y_{3.3}$)	PBV (Lag_PBV)	$\frac{\textit{Price}}{\textit{Book value of stock}}$
Independent variables		
VAIC	Sum of HCE, SCE and CEE $VA = OP + EC + D + A$ $VAIC = ICE + CEE$ $ICE = HCE + SCE$	A = value-added OP = operating profit EC = employee costs D = depreciation A = amortisation
Human capital efficiency (X_1)	HCE	$\frac{VA}{HC} = \frac{\textit{Value added}}{\textit{Employee costs}}$
Capital employee efficiency (X_2)	CEE	$\frac{VA}{CE} = \frac{\textit{Value added}}{\textit{Capital equity}}$
Structural capital efficiency (X_3)	SCE	$\frac{VA - HC}{VA} = \frac{\textit{Value added} - \textit{Human capital}}{\textit{Value added}}$
Control variable		
Interest (X_4)	Interest expenses	Natural logarithm of interest expenses
Size (X_5)	Ln assets	Natural logarithm of total assets (AT)
LAG X (Cochrane Orcutt method)	X – (Unstandardised coefficient beta between LAG_RES and unstandardised predicted value * LAG_X) to remove autocorrelation	

4 Results and discussion

4.1 Descriptive statistics

Based on the results of descriptive statistical analysis for each variable, it can be seen in Table 2.

Table 2 Descriptive statistics

Variables	*N*	*Mean*	*SD*	*Minimum*	*Maximum*
CEE	507	0.204	0.661	–1.978	5.253
HCE	499	3.729	9.553	–4.781	69.695
SCE	505	0.485	3.933	–2.578	39.041
ROA	506	0.046	0.093	–0.408	0.607
ROE	497	0.073	0.266	–1.703	2.555
ROI	505	0.126	0.204	–0.975	0.951
DER	507	1.110	0.934	0.006	11.098
DAR	499	0.432	0.202	0.003	0.859
PER	506	1.548	19.876	–8.959	94.260
PBV	503	5.146	8.979	–1.137	58.036
Tobins Q	502	1.693	1.477	0.036	9.801
ln_Interest	506	1.007	1.003	5.202	12.717
ln_Asset	506	1.223	0.687	10.243	14.546
Valid N (listwise)	472				

HCE which shows the contribution of salary and wage costs in producing value-added has the highest level of efficiency among the VAIC components with an average of 3.729, and the highest variance of 9.553 compared to SCE and CEE with an average of 0.485, and 0.204 and a standard deviation of 3.933 and 0.661, respectively. Furthermore, the highest level of profitability is ROI with an average of 0.126, followed by ROE and ROA respectively 0.0273, and 0.046, with almost the same data variation values, the highest being ROE of 0.2 next ROI, 0.204 and ROA of 0.093. The average debt condition divided by assets is 0.432, the minimum value is 0.003, and the maximum value is 0.859 showing a reasonable funding structure, and the average DER value is 1.110, with a standard deviation of 0.934, in this case, company performance and leverage act as mediating variables. Finally, the company value condition that has the highest value is PBV with an average of 5.146, which is greater than Tobin's Q of 1.693, and PER 1.548. A detailed statistical description can be seen in Table 2.

4.2 Correlation analysis

Description of the relationship between intellectual capital variables CEE and HCE have a relationship with company performance ROI, ROE and ROA, and SCE is not related. Meanwhile, the only CEE variable that has a relationship with leverage (DER). On the other hand, the variables that have a relationship with PER are CEE, HCE, and SCE which are not related to PER, all VAIC components are not related to Tobin'sQ. The pattern of relationships between variables will be tested in depth using panel regression,

as well as to test hypotheses and answer research objectives. In detail can be seen in Table 3.

4.3 Robustness tests of the model

Diagnostic tests to confirm the robustness model with size and interest as control variables. *The first* step is the classic multiple regression assumption test. From the normality test of the data using the Kolmogorov-Smirnov (K-S) test, K-S results for all variables showed a significance value below 0.05, indicate data conditions were normal. Furthermore, based on the multicollinearity test, the cut off VIF = 1 / tolerance value is below 10% of each variable, so there is no multicollinearity. In the autocorrelation test, the Durbin-Watson value in rank = $dl < DW < 4 - du$, N table of sample 507 with K 7, the dl value is 1.707 and du 1.831. If 4 – 1.831 = 2.169 then the DW value is between $1.707 < DW < 2.169$; by using the Cochrane-Orcutt method, all variables have no autocorrelation. The heteroscedasticity based on the scatter plot diagram of the data does not show a certain pattern.

The next stage is using path analysis. The first is to examine the effect of the VAIC components: CEE, HCE, and SCE, on the firm performance, with interest and size as the control variables. To get a robust model, it can be tested through the regression panel:

$$\{ROI_{1.1} \mid ROE_{1.2} \mid ROA_{1.3}\}_{i,t} = \beta_0 + \beta_1 HCE_{i,t} + \beta_2 CEE_{i,t} + \beta_3 SCE_{i,t} + \sum_{k=4}^{m} \beta_k Interest_k + \sum_{k=5}^{m} \beta_k Size_k + \sum_{i,t}$$

Note: {*ROI* = Model 1_a; 1_b | *ROE* = Model 2_a; 2_b | *ROA* = Model 3_a; 3_b}, *Interest* and *Size* as control variable.

Regression Model 1_a and 1_b show that a valid measure of firm performance in the model of the effects of the VAIC component on firm performance is *ROI* and *ROE*. *ROI* is obtained from earnings before interest and taxes divided by assets, significantly producing a robust model with *Interest* and *Size* as control variables. The regression coefficients of *CEE*, *HCE*, and *SCE* on *ROI* are 0.507 (p = 0.000), 0.123 (p = 0.002), and –0.057 (p = 0.136). The *IC* that affects *ROA* is *CEE*, *HCE*, –0.192 (0.002), and 0.243 (0.000), respectively, and the only *CEE* that affects *ROE* is 0.658 (p = 0.000). Based on the sensitivity analysis of the *ROI* and *ROA* models, each has adjusted R square value of 0.314 (p = 0.000) when using *ROI* which is greater than 0.274 (p = 0.000) for *ROA*, while *ROE* shows unstable results before and after entering the control variables *Size* and *Interest*. Thus, the model is robust when firm performance uses *ROI* measurements. Firm performance (*ROI*) and *DER* act as fully mediating variables in the relationship between *CEE*, *HCE* and firm value (Tobin'sQ). The results of this study support Bassetti et al. (2019). For details, see Tables 4 and 5.

The second path of the VAIC component on the debt-to-equity ratio ($DER_{i,t}$) with *Interest* and *Size* as control variables in Model 4_a and 4_b with the equation model:

- Model $4_{a;b}$

$$DER_{2.2i,t} = \alpha + \beta_1 HCE_{i,t} + \beta_2 SCE_{i,t} + \sum_{k=4}^{m} \beta_k Interest_k + \sum_{k=5}^{m} \beta_k Size_k + \sum_{i,t}$$

Table 3 Pearson correlation coefficients

Pearson correlation	*Size*	*Interest*	*CEE*	*HCE*	*SCE*	*ROE*	*LAG_ROI*	*LAG_ROA*	*LAG_DER*	*LAG_DAR*	*LAG_Tobin's Q*	*LAG_PER*	*LAG_PBV*
Size	1												
Interest	*0.769****	*1*											
CEE	0.062	0.072	*1*										
HCE	*0.211****	0.073	*0.243****	*1*									
SCE	0.024	*0.074**	–0.009	0.018	*1*								
ROE	*0.112***	*0.080**	*0.667****	*0.216****	–0.009	*1*							
LAG_ROI	*0.105***	0.049	*0.524****	*0.243****	–0.060	*0.447****	*1*						
LAG_ROA	*0.171****	0.041	*0.403****	*0.365****	–0.058	*0.507****	0.503**	*1*					
LAG_DER	0.005	0.013	*0.145****	0.013	0.017	0.016	0.06	–0.078*	*1*				
LAG_DAR	0.019	*0.159****	–0.054	–0.013	0.005	–0.043	–0.00	–0.152***	0.592***	*1*			
LAG_Tobin's Q	0.067	*0.091***	0.075	0.035	0.023	0.082*	0.114*	0.175***	–0.073	–0.041	*1*		
LAG_PER	0.015	–0.039	*0.140****	*0.147****	–0.052	*0.095***	*0.175***	*0.145****	0.015	*–0.087**	0.073	*1*	
LAG_PBV	*–155****	*–135****	*0.322****	*0.155****	0.003	*0.240****	*0.243***	*0.184****	*0.097***	*–0.003*	*0.255****	*0.125****	*1*

Notes: Number of observations: 507. See Table 1 for variable definitions.
***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 4 Robustness test of the model using panel regression with size and interest as control variables

Variables	*Description*	*Model 1a* *Log_ROI$_{it}$*	*Model 2a* *ROE$_{it}$*	*Panel 3a* *ROA$_{it}$*	*Model 4a* *Log_DER$_{it}$*	*Model 5a* *Log_Tobin's Q$_{it}$*	*Model 6a* *Log_PER$_{it}$*	*Model 7a* *Log_PBV$_{it}$*
CEE_{it}	Capital employee efficiency	*0.507* *(0.000)****	*0.608* *(0.000)****	*0.344* *(0.000)****	*0.152* *(0.001)****	−0.007 (0.892)	0.052 (0.340)	*0.270* *(0.000)****
HCE_{it}	Human capital efficiency	*0.123* *(0.002)****	0.045 (0.191)	*0.254* *(0.000)****	−0.024 (0.607)	0.031 (0.520)	*0.100* *(0.037)***	*0.082* *(0.067)**
SCE_{it}	Structural capital efficiency	−0.057 (0.136)	−0.006 (0.848)	−0.051 (0.192)	0.016 (0.725)	0.013 (0.777)	−0.041 (0.369)	0.007 (0.863)
$Interest_{it}$	*Interest as control variable*	0.073 (0.218)	0.020 (0.687)	*−0.192* *(0.002)****	0.058 (0.407)	*0.192* *(0.007)****	−0.078 (0.267)	0.017 (0.794)
$Size_{it}$	Assets *as control variable*	0.101 (0.092)*	0.020 (0.699)	*0.243* *(0.000)****	−0.042 (0.555)	−0.098 (0.170)	039 (0.580)	*−0.227* *(0.001)****
LAG_ROI_{it}	Return on investment					*0.121* *(0.023)***	*0.122* *(0.023)***	*0.111* *(0.051)***
LAG_DER_{it}	Debt-to-equity ratio					*−0.109* *(0.017)***	−.037 (0.418)	0.038 (0.374)
Constant		−0.228 (0.218)	−0.237 (0.430)	*−0.209* *(0.002)****	0.783 (0.352)	0.896 (0.548)	10.195 (0.549)	33.279 (0.000)***
Number of observation		507	507	507	507	507	507	507
R^2	R squared	*0.314*	*0.495*	*0.274*	*0.024*	*0.042*	*0.049*	*0.165*
Sig. F change		*(0.000)****	*(0.000)****	*(0.000)****	*(0.059)***	*(0.005)****	*(0.001)****	*0.000****

Notes: Number of observations: 507. See Table 1 for variable definitions.
***, ** and * denote significance at the 1%, 5% and 10% levels, respective.

Table 5 Robustness test using panel regression with deleted the control variables

Variables	Description	Model 1 Log_ROI$_{i,t}$	Model 2 ROE$_{i,t}$	Panel 3 ROA$_{i,t}$	Model 4 Log_DER$_{i,t}$	Model 5 Log_Tobin's Q$_{i,t}$	Model 6 Log_PER$_{i,t}$	Model 7 Log_PBV$_{i,t}$
CEE$_{i,t}$	Capital employee efficiency	*0.493*	*0.658*	*0.341*	*0.150*	−0.025	0.051	*0.264*
		*(0.000)******	*(0.000)******	*(0.000)******	*(0.001)******	(0.638)	(0.338)	*(0.000)******
HCE$_{i,t}$	Human capital efficiency	*0.139*	0.055	*0.289*	−0.023	0.024	*0.104*	0.049
		*(0.000)******	(0.110)	*(0.000)******	(0.620)	(0.617)	*(0.026)****	(0.275)
SCE$_{i,t}$	Structural capital efficiency	−0.060	−0.004	−0.061	0.019	0.026	−0.046	0.005
		(0.118)	(0.906)	(0.124)	(0.670)	(0.577)	(0.311)	(0.910)
Interest$_{i,t}$	*Interest as control variable*	-	-	-	-	-	-	-
Size$_{i,t}$	Assets *as control variable*	-	-	-	-	-	-	-
LAG_ROI$_{i,t}$	Return on investment					*0.125*	*0.123*	*0.088*
						*(0.020)****	*(0.022)****	*(0.091)**
LAG_DER$_{i,t}$	Debt-to-equity ratio					*−0.108*	−0.036	0.052
						*(0.018)****	(0.422)	(0.229)
Constant		*0.044*	*0.032*	*−0.010*	*0.623*	*1.173*	*8.760*	*1.931*
		*(0.000)******	*(0.063)**	*(0.007)******	*(0.000)******	*(0.000)******	*(0.000)******	*(0.000)******
Number of observation		507	507	507	507	507	507	507
R^2	R-squared	*0.293*	*0.454*	*0.247*	*0.022*	*0.026*	*0.046*	*0.119*
Sig F change		*(0.000)******	*(0.000)******	*(0.000)******	*(0.014)****	*(0.032)****	*(0.000)******	*0.000******

Notes: Number of observations: 507. See Table 1 for variable definitions.
***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Leverage measurement robustly using DER has been supported by Liu and Wong (2011) and Modigliani and Miller (1963) after and before entering *Interest* and *Size* as control variables, the consistently standardised coefficient beta of *CEE* affects *DER*, 0.137 (p = 0.003). Meanwhile, the *HCE* and *SCE* were not significant.

In the third path, testing VAIC components: *CEE*, *HCE*, *SCE* affects firm value. To get a valid firm value measurement model using a regression panel between Tobin's Q, *PER* and *PBV*, with *Interest* and *Size* as control variables, we use the equation:

$$\{Tobin'sQ_{3.3} \mid PER_{3.2} \mid PBV_{3.1} \mid\}_{i,t} = \beta_0 + \beta_1 HCE_{i,t} + \beta_2 CEE_{i,t} + \beta_3 SCE_{i,t} + \beta_4 ROA_{i,t} + \beta_5 DER_{i,t} + \sum_{k=6}^{m} \beta_k Interest_k + \sum_{k=7}^{m} \beta_k Size_k + \sum_{i,t}$$

Note: {*Tobin'sQ* = Model 5_a; 5_b} | *PER* = Model 6_a; 6_b | *PBV* = Model 7_a; 7_b}, *Interest* and *Size* as control variables.

Based on Model $5_{a;b}$, Model $6_{a;b}$, and Model $7_{a;b}$ show consistent results when measuring firm value using *Tobin'sQ* and *PER* with the control variables *Interest* and *Size*, while *PBV* shows inconsistent results. In this case, the variables that affect Tobin's Q are leverage (*DER*) and firm performance (*ROI*), respectively, that is, –0.125 (p = 0.020), and 0.123 (p = 0.022), while *CEE*, *HCE*, and *SCE* statistically do not affect Tobin's Q. Tobin's Q value obtained from market capitalisation + debt market value divided by assets represents the response of investors and creditors to firm performance (*ROI*) and capital structure (*DER*).

When a firm value uses *PER*, the variables that directly affect *PER* are *HCE*, 0.100 (p = 0.037), and *ROI*, 0.122 (p = 0.025). *PER* obtained from price divided by earnings per share (*EPS*) reflects the response of investors to earnings (*ROI*), and responds to human capital in generating added value (*HCE*). Thus, the disclosure of intellectual capital information content can be seen directly from the relationship between the *VAIC* component and *PER* and indirectly through *ROI* and *DER* using Tobin's Q measurement. When firm values with *PBV*, variables that directly affect *PBV* when placing and remove the control variables interest and size, the model showing inconsistent.

These findings are robustly able to explain the inconsistent results of previous studies regarding the relationship between IC and firm value are caused by different firm value measurements produce different stakeholders responses.

The results of this study are methodologically robust, resulting in an integrated model that can reveal the information content of VAIC and its effect on firm value through firm performance and leverage. This is in line with research objectives and previous research (Harris and Raviv, 1991; Edvinsson, 1997; Bassetti et al., 2019; Stahle et al., 2011; Liu and Wong, 2011). For more details, see Tables 4 and 5.

4.4 Discussion

Equation model 1:

$$ROI_{i,t} = \beta_0 + \beta_1 HCE_{i,t} + \beta_2 CEE_{i,t} + \beta_3 SCE_{i,t} + \sum_{k=4}^{m} \beta_k Interest_k + \sum_{k=5}^{m} \beta_k Size_k + \sum_{i,t}$$

The first path analysis, testing the hypothesis (H1a, H1b, H1c), $CEE_{i,t}$, $HCE_{i,t}$, and $SCE_{i,t}$, have a positive effect on financial performance (*ROI*), with *Interest* and *Size* as control variables, the results show that $CEE_{i,t}$ and $HCE_{i,t}$ have a positive association with *ROI* each 0.493 (p = 0.000) and 0.139 (p = 0.000). Thus, this study is robustly in line with Bassetti et al. (2019) and Celenza and Rossi (2014). On the other hand, some of the previous studies showing inconsistent result, when $CEE_{i,t}$, $HCE_{i,t}$, and $SCE_{i,t}$, in influencing the firm performance, use different measures, namely *ROA*, *ROE*, and *ROI*, showing inconsistent results (Zéghal and Maaloul, 2010; Stahle et al., 2011; (Rehman *et al*., 2011).

To illustrate the comparison of HCE effect on company performance in Greek listed, on London Stock Exchange, and service companies in Spain (Zéghal and Maaloul, 2010; Maditinos et al., 2011; Alves et al., 2021). This phenomenon shows that HCE has a positive effect on the firm performance. On the other hand, in developing countries, *CEE* does not affect company performance (*ROA*) (Singla, 2020). Manufacturing conditions in Turkey show that *CEE* does not affect firm performance (*ROA*) (Janoševic and Dženopoljać, 2012). It can be seen that companies that have good intellectual capital will be able to encourage increased company performance inline with (Rehman *et al*., 2011; Vale et al. (2022; Bhattacharjee and Akter (2022).

Equation model 2:

$$DER_{i,t} = \beta_0 + \beta_1 HCE_{i,t} + \beta_2 CEE_{i,t} + \beta_3 SCE_{i,t} + \sum_{k=4}^{m} \beta_4 Interest_{i,t} + \sum_{k=5}^{m} \beta_5 Size_{i,t} + \sum_{i,t}$$

The second path analysis shows that CEE has an association with the capital structure (*DER*), with a regression coefficient of 0.150 (p = 0.001). The results of this study are in line with the research conditions of companies in Italy, Denmark, and the USA, and empirical evidence from companies in South Korea (Salvi et al., 2020; Eklund, 2020; Hu and Wong, 2011; Kim et al., 2011). Empirical evidence from Korea shows that RCE has a positive effect on capital structure (*DER*) (Kim et al., 2011). This is relevant to the theory of optimal capital structure (Modigliani and Miller, 1963).

Equation model 3:

$$Tobin's\ Q_{i,t} = \beta_0 + \beta_1 HCE_{i,t} + \beta_2 CEE_{i,t} + \beta_3 SCE_{i,t} + \beta_4 ROI_{i,t} + \beta_5 DER_{i,t} + \sum_{k=6}^{m} \beta_6 Interest_{i,t} + \sum_{k=7}^{m} \beta_7 Size_{i,t} + \varepsilon_{i,t}$$

The third path equation shows that the component *VAIC* = {*CEE*, *HCE*, *SCE*}, 3 ∈ *VAIC* does not have a direct effect on Tobin's Q, consistent with the research (Rossi and Celenza, 2013; Celenza and Rossi, 2014) on Italy. *ROI* has a positive effect on Tobin's Q with a regression coefficient of 0.125 (p = 0.020), and *DER* negatively affects Tobin's Q with a regression coefficient of –0.108 (p = 0.018). This is in line with Singla (2020), who examines the infrastructure and real estate construction industry as part of Indian firm values using the indicator *PBV*. This is different from what was done by Smriti and Das (2018), for these cases of companies in India show that all components of VAIC have a positive effect on *Tobin's* $Q_{i,t}$.

Based on the findings of this study and previous research, it can be understood that the effect of the information content of the VAIC component on firm value can be seen from three sides: First, when HCE is optimised by physical capital, namely *SCE* and *CEE*, can create earning before interest, tax, depreciation, and amortisation (*EBITDA*), and investors will respond to the firm performance. Second, the level of sophistication of market players in analysing information on the VAIC component will impact firm value. Third is the role of variable (*ROI*) and the funding strategy policy (*DER*) as fully mediating variables, between the information content of the VAIC components on firm value (Tobin's Q).

Path analysis model 4

Integrated path analysis based on equation model 1, model 2 and model 3

Based on the analysis equation models 1, 2, and 3, and answering the hypothesis of the effect of $VAIC = \{CEE, HCE, SCE\}$, $3 \in VAIC$. On Tobin's Q through the mediating variables *ROI* and *DER*, the results show that no VAIC component variable directly affects Tobin's Q. On the other hand, *CEE* and *HCE* affect the financial performance of *ROI*, with a regression coefficient of 0.493 (p = 0.000) and 0.139 (p = 0.020). Furthermore, *ROI* affects Tobin's Q with a regression coefficient of 0.125 (p = 0.020). In this case, the variable *ROI* fully meditates the relationship between *CEE* and *HCE* for Tobin's Q.

Table 6 Effect of CEE, HCE, and SCE on firm performance, DER and firm value (Tobin's Q) based on robust model

No.	*Description*	*ROI ($Y_{1.1}$)*	*DER (Y_2)*	*Tobin's Q ($Y_{3.1}$)*	*PER ($Y_{3.2}$)*
1	Capital employee efficiency (X_1)	*0.493* *(0.000)****	*0.150* *(0.001)****	–0.025 (0.638)	0.051 (0.338)
2	Human capital efficiency (X_2)	*0.139* *(0.000)****	–0.023 (0.620)	0.024 (0.617)	*0.104* *(0.026)***
3	Structural capital efficiency (X_3)	–0.060 (0.118)	0.019 (0.670)	0.026 (0.577)	–0.046 (0.311)
4	Financial performance ROI ($Y_{1.1}$)			*0.125* *(0.020)***	*0.123* *(0.022)***
5	Leverage DER (Y_2)			*0.108* *(0.018)***	–0.036 (0.422)
Constant		*0.044* *(0.000)****	*0.623* *(0.000)****	*1.173* *(0.000)****	*8.760* *(0.000)****
Number of observations		507	507	507	507
R^2 (R-squared)		*0.295*	*0.022*	*0.026*	*0.046*
Sig F change		*(0.000)****	*(0.014)***	*(0.032)***	*(0.000)****

Notes: *, ** and *** level of significance at the 10%, 5% and 1%. S = significant and NS = not significant. For variable definition, see Table 1.

Table 7 Effect of CEE, HCE, and RCE on Tobin's Q through ROI and DER based on robust modal

Indirect effect	*Direct effect of IC on ROI and DER*	*Direct effect of ROI, DER on Q*	*Direct effect of IC on Q*	*Indirect effect*	*Description*
$X_1 \rightarrow Y_1 \rightarrow Y_3$	$X_1 \rightarrow Y_1$: *0.493 (0.000)****	$Y_1 \rightarrow Y_3$: *0.123 (0.030)***	$X_1 \rightarrow Y_3$: −0.025 (0.638)	*0.0618**	S= (fully mediating)
$X_2 \rightarrow Y_1 \rightarrow Y_3$	$X_2 \rightarrow Y_1$: *0.119 (0.000)****	$Y_1 \rightarrow Y_3$: *0.123 (0.030)***	$X_2 \rightarrow Y_3$: 0.024 (0.617)	*0.0174***	S= (fully mediating)
$X_2 \rightarrow Y_2 \rightarrow Y_3$	$X_2 \rightarrow Y_2$: −0.060 (0.118)	$Y_2 \rightarrow Y_3$: *0.123 (0.030)***	$X_2 \rightarrow Y_3$: 0.026 (0.577)	−0.0073	NS=
$X_1 \rightarrow Y_2 \rightarrow Y_3$	$X_1 \rightarrow Y_2$: *0.170 (0.001)****	$Y_2 \rightarrow Y_3$: *0.108 (0.018)***	$X_1 \rightarrow Y_3$: −0.025 (0.638)	*−0.0182***	S= (fully mediating)
$X_2 \rightarrow Y_2 \rightarrow Y_3$	$X_2 \rightarrow Y_2$: −0.023 (0.620)	$Y_2 \rightarrow Y_3$: *0.108 (0.018)***	$X_2 \rightarrow Y_3$: 0.024 (0.617)	−0.0025	NS=
$X_2 \rightarrow Y_2 \rightarrow Y_3$	$X_2 \rightarrow Y_2$: 0.019 (0.670)	$Y_2 \rightarrow Y_3$: *0.108 (0.018)***	$X_2 \rightarrow Y_3$: 0.026 (0.577)	0.0021	NS

Notes: *, ** and *** level of significance at 10%, 5% and 1%. S = significant and NS = not significant. For variable definitions, see Table 1.

Table 8 Effect of CEE, HCE, and SCE on PER through ROI and DER based on robust model

Indirect effect	*Direct effect of IC on ROI and DER*		*Direct effect of ROI, DER on PER*		*Direct effect of IC on PER*		*Indirect effect*	*Description*
$X_1 \rightarrow Y_{11} \rightarrow Y_{12}$	$X_1 \rightarrow Y_{11}$	0.493 (0.000)***	$Y_1 \rightarrow Y_{12}$	0.123 (0.022)**	$X_1 \rightarrow Y_{12}$	0.051 (0.338)	0.0606*	S+ (fully mediating)
$X_2 \rightarrow Y_{11} \rightarrow Y_{12}$	$X_2 \rightarrow Y_{11}$	0.139 (0.000)***	$Y_1 \rightarrow Y_{12}$	0.123 (0.022)**	$X_2 \rightarrow Y_{12}$	0.104 (0.026)**	0.0171**	S+ (partial mediating)
$X_3 \rightarrow Y_{11} \rightarrow Y_{12}$	$X_3 \rightarrow Y_{11}$	−0.060 (0.118)	$Y_1 \rightarrow Y_{12}$	0.123 (0.022)**	$X_3 \rightarrow Y_{12}$	−0.046 (0.311)	−0.0074	NS
$X_1 \rightarrow Y_2 \rightarrow Y_{12}$	$X_1 \rightarrow Y_2$	0.150 (0.001)***	$Y_2 \rightarrow Y_{12}$	−0.036 (0.422)	$X_1 \rightarrow Y_{12}$	0.051 (0.338)	−0.0054	NS
$X_2 \rightarrow Y_2 \rightarrow Y_{12}$	$X_2 \rightarrow Y_2$	−0.023 (0.620)	$Y_2 \rightarrow Y_{12}$	−0.036 (0.422)	$X_2 \rightarrow Y_{12}$	0.104 (0.026)**	−0.0008	NS
$X_3 \rightarrow Y_2 \rightarrow Y_{12}$	$X_3 \rightarrow Y_2$	0.019 (0.670)	$Y_2 \rightarrow Y_{12}$	−0.036 (0.422)	$X_3 \rightarrow Y_{12}$	−0.046 (0.311)	−0.0007	NS

Note: *, ** and *** level of significance at 10%, 5% and 1%. S = significant and NS = not significant. For variable definition, see Table 1.

Next, discussing the effect of *VAIC* = {*CEE*, *HCE*, *SCE*}, 3 ∈ *VAIC* to firm value (Tobin's Q) through *DER*, we find that no *VAIC* component variable directly affects Tobin's Q. On the other hand, *CEE* affects *DER* with a regression coefficient of 0.150 (p = 0.001), and *HCE* and *SCE* do not affect *DER*. Then, *DER* affects the Tobin's Q of 0.108 (p = 0.018). This shows that *DER* acts as a fully mediating variable on the effect of *CEE* on Tobin's Q. This research is in line with Liu and Wong (2011), Kim et al. (2011) and Smriti and Das (2018), in which intellectual capital affects firm value mediated by *DER*.

When measuring firm value using *PER*, *ROI* fully mediates the relationship between *CEE* and *PER* through *ROI*, with an indirect effect coefficient of 0.0606; partially mediates between *HCE* and *PER* 0.0171; and *HCE* directly affected *PER* 0.104 (p = 0.026), and *DER* does not act as a mediating variable between *IC* and *PER*. Thus, methodologically, the integrated model is able to show the role of the mediating variables *ROI* and *DER* robustly when measuring company value using Tobin's Q. The results of this empirical study are able to answer the research objectives, namely, being able to show information content disclosure of intellectual capital affecting firm value (Tobin's Q), through *ROI* and *DER*, see Tables 6, 7 and 8 in details.

5 Conclusions

First conclusion is that components of VAIC affecting firm performance (*ROI*) are *CEE* and *HCE* for manufacturing industry in line with Hoang et al. (2020), Maji and Goswami (2020), Bassetti et al. (2019) and Celenza and Rossi (2014).

The second is based on the robustness test of the valid firm performance measurement model concerning the VAIC component using *ROI* then *ROA* and *ROE*, in line with Bassetti et al. (2019). An important factor that needs to be considered which causes inconsistent research results is the type of industry and measurement of the variables used. In this case, the influence of the VAIC component on firm performance in the banking industry is *HCE* and *SCE* (Rosita et al., 2020).

The third is that firm value variables that are consistently valid when including control interest and firm size variables are *Tobin's Q* and *PER*, but they have different financial behavioural implications. When firm value uses *Tobin's Q*, the *ROI* and *DER* variables fully mediates the effect of *CEE* and *HCE* on the firm values. On the other hand, *DER* variable cannot mediate the relationship between VAIC component and *PER*. Thus, it cannot answer the research objectives and hypotheses to place company performance variables and leverage as mediating variables, only able to partially mediate the relationship between *HCE* and *PER*. Can be concluded, when using Tobin's Q obtained from (market capitalisation + book value of liabilities) divides book value of assets and implies the interaction of investors, creditors, and the management performance. Meanwhile, *PER* only focuses on earnings per share and stock market prices.

Therefore, in interpreting the relationship between the components of VAIC, it is necessary to pay attention to the involvement of the principals and agent relationships and their effect on firm value. In accordance with the research objectives, this research can show a robust integrated model in revealing the information content of intellectual capital, by placing firm performance variables (*ROI*) and leverage (*DER*) as mediating variables between intellectual capital and firm value (*Tobin's Q*) in line with agency

theory, optimum capital structure, and stakeholder theory as a medium for interaction between company stakeholders (Singla, 2020; Salenza and Rossi, 2014; Modigliani and Miller, 1963; Pulić, 2008; De Wet, 2006; Peng *et al.*, 2020; Jensen and Meckling, 1976; Cardorel et al., 2021; (Harmono *et al.*, 2023).

5.1 The implication for practice

For *management*, the existence of an indirect relationship between information content of VAIC using HCE and CEE measurements with *Tobin'sQ* through *ROI* and *DER* implies that management's efforts to increase the added value of intellectual capital must be proven by increasing profitability and being able to maintain an optimal capital structure. Of course, in increasing the profitability of a VAIC company that emphasises efficiency, developed on the effectiveness of the company operation, it can use measurement of ATO, relational capital, company innovation through research and development and other activities that lead to the measurement of multidimensional intellectual capital.

Investors and creditors will analyse the VAIC component: not only attention to the company performance and funding structure but also the need to evaluate the level of efficiency and productivity of the workforce in creating added value.

For policymakers, information on financial performance, IC, and capital structure can be used as a basis for determining indicators of a company sustainability, including the requirement of determining credit policies for companies. For the government, it is necessary to observe the tendency of companies to carry out tax planning by increasing debt and reducing taxable income.

5.2 Implications for researchers and civil society

For civil society, intellectual capital disclosure can be developed for corporate social responsibility and other innovation dimensions to create a multidimensional disclosure effect on company performance and firm value, useful for controlling social responsibility.

For academics, the novelty of this research can place the intervening variables *ROI* and *DER* between *IC* and firm value (*Tobin's Q*), which are the key variables that can be developed to reveal multidimensional IC indicators related to various business strategies both internal, such as technological innovation, patents, ATO, research, and development, and external, such as strategies related to promotions, sales strategies, and multidimensional customer focus, in line with the views of IC experts (Edvinsson, 2013, 1997; Sveiby, 1997; Kaplan and Norton, 1992; Iazzolino and Laise, 2013; Cavicchi and Vagnoni, 2018).

References

Alipour, M. (2012) 'The effect of intellectual capital on firm performance: an investigation of Iran insurance companies', *Measuring Business Excellence*, Vol. 16, No. 1, pp.53–66, DOI: 10.1108/13683041211204671.

Alves, H. et al. (2021) 'The role of intellectual capital in fostering SD-orientation and firm performance', *Journal of Intellectual Capital*, Vol. 22, No. 1, pp.57–75, DOI: 10.1108/JIC-11-2019-0262.

Bassetti, T. et al. (2019) 'A critical validation of the value added intellectual coefficient: use in empirical research and comparison with alternative measures of intellectual capital', *Journal of Management and Governance*, pp.1115–1145, Springer US, DOI [online] https://doi.org/10.1007/s10997-019-09494-wA.

Bhattacharjee, S. and Akter, R. (2022) 'Intellectual capital efficiency and firm performance: evidence from an emerging knowledge-economy', *International Journal of Learning and Intellectual Capital*, Vol. 19, No. 1, pp.30–52 [online] https://doi.org/10.1504/IJLIC.2022.119284.

Bontis, N. et al. (2018) 'Intellectual capital and financial performance in social cooperative enterprises', *Journal of Intellectual Capital*, Vol. 19, No. 4, pp.712–731, DOI: 10.1108/JIC-03-2017-0049.

Bouchaud, J.P., Matacz, A. and Potters, M. (2001) 'Leverage effect in financial markets: the retarded volatility model', *Physical Review Letters*, Vol. 87, No. 22, pp.228701–228701-4, DOI: 10.1103/PhysRevLett.87.228701.

Cardorel, O.C., Appiah, B.K. and Majumder, S.C. (2021) 'Determinants of market to book value and financial performance of Chinese listed firms: implication of MVAIC model', *International Journal of Learning and Intellectual Capital*, Vol. 1, No. 1, p.1 [online] https://doi.org/10.1504/ijlic.2021.10034909.

Cavicchi, C. and Vagnoni, E. (2018) 'Intellectual capital in support of farm businesses' strategic management: a case study', *Journal of Intellectual Capital*, Vol. 19, No. 4, pp.692–711, DOI: 10.1108/JIC-11-2017-0150.

Celenza, D. and Rossi, F. (2014) 'Intellectual capital and performance of listed companies: empirical evidence from Italy', *Measuring Business Excellence*, Vol. 18, No. 1, pp.22–35, DOI: 10.1108/MBE-10-2013-0054.

Chen, M.C., Cheng, S.J. and Hwang, Y. (2005) 'An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance', *Journal of Intellectual Capital*, Vol. 6, No. 2, pp.159–176, DOI: 10.1108/14691930510592771.

Cheng, M.Y., Lin, J., Hsiao, T. and Lin, T.W. (2010) 'Invested resource, competitive intellectual capital, and corporate performance', *Journal of Intellectual Capital*, Vol. 11, No. 4, pp.433–450, DOI: 10.1108/14691931011085623.

Connelly, B.L., Certo, S.T., Ireland, R.D. and Reutzel, C.R. (2011) 'Signaling theory: a review and assessment', *Journal of Management*, Vol. 37, No. 1, pp.39–67, DOI: 10.1177/0149206310388419.

De Wet, J. (2006) 'Determining the optimal capital structure: a practical contemporary approach', *Meditari Accountancy Research*, Vol. 14, No. 2, pp.1–16.

Edvinsson, L. (1997) 'Developing intellectual capital at Skandia', *Long Range Planning*, Vol. 30, No. 3, pp.366–373, DOI: 10.1016/s0024-6301(97)90248-x.

Edvinsson, L. (2002) 'The new knowledge economics', *Business Strategy Review*, Vol. 13, No. 3, pp.72–76, DOI: 10.1111/1467-8616.00225.

Edvinsson, L. (2013) 'IC 21: reflections from 21 years of IC practice and theory', *Journal of Intellectual Capital*, Vol. 14, No. 1, pp.163–172, DOI: 10.1108/14691931311289075.

Edvinsson, L. et al. (2022) 'From a value-based knowledge economy to a worth economy. New reflections and perspectives on intellectual capital research', *International Journal of Learning and Intellectual Capital*, Vol. 19, No. 1, pp.83–101 [online] https://doi.org/10.1504/IJLIC.2022.119282.

Eklund, C.M. (2020) 'Why do some SME's become high-growth firms? The role of employee competences', *Journal of Intellectual Capital*, Vol. 21, No. 5, pp.691–707, DOI: 10.1108/JIC-07-2019-0188.

Fama, E.F. (1970) 'Efficient Capital Market: A Review of Theory and Empirical Work', *The Journal of Finance*, Vol. 25, No. 2, Papers and Proceedings of the Twenty-Eighth Annual Meeting of the American Finance Association New York, N.Y. December, 28-30, 1969 (May, 1970), pp. 383-417, doi:10.2307/2325486

Frank, M.Z. and Goyal, V.K. (2003) 'Testing the pecking order theory of capital structure', *Journal of Financial Economics*, Vol. 67, No. 2, pp.217–248, DOI: 10.1016/S0304- 405X(02)00252-0.

Gupta, K. and Raman, T.V. (2021) 'Intellectual capital: a determinant of firms' operational efficiency', *South Asian Journal of Business Studies*, Vol. 10, No. 1, pp.49–69 [online] https://doi.org/10.1108/SAJBS-11-2019-0207.

Rehman, W. ul *et al.* (2011) 'Intellectual Capital Performance and Its Impact on Corporate Performance: an Empirical Evidence From Modaraba Sector of Pakistan.', *Australian Journal of Business and Management Research*, 01(05), pp. 08–16. Available at: https://doi.org/10.52283/nswrca.ajbmr.20110105a02.

Harmono, H. *et al.* (2023) 'Financial Performance and Ownership Structure: Influence on Firm Value Through Leverage', in (University of Kansas USA) Barnett, William A and B.S. (Harvard U.U. Sergi (eds) *Macroeconomic Risk and Growth in the Southeast Asian Countries: Insight from SEA*. Emerald Publishing Limited (International Symposia in Economic Theory and Econometrics), pp. 63–85. Available at: https://doi.org/10.1108/S1571-03862023000033B005.

Harris, M. and Raviv, A. (1991) 'The theory of capital structure', *The Journal of Finance*, Vol. 46, No. 1, pp.297–355, DOI: 10.1111/j.1540-6261.1991.tb03753.x.

Hoang, H.T. et al. (2020) 'Intellectual capital and firm performance in Vietnam 2012–2016', *International Journal of Learning and Intellectual Capital*, Vol. 17, No. 1, pp.27–46 [online] https://doi.org/10.1504/IJLIC.2020.105325.

Iazzolino, G. and Laise, D. (2013) 'Value added intellectual coefficient (VAIC): a methodological and critical review', *Journal of Intellectual Capital*, Vol. 14, No. 4, pp.547–563, DOI: 10.1108/JIC-12-2012-0107.

Janoševic, S. and Dženopoljać, V. (2012) 'Impact of intellectual capital on financial performance of Serbian companies', *Actual Problems of Economics*, Vol. 133, No. 7, pp.554–564.

Javornik, S., Tekavcic, M. and Marc, M. (2012) 'The efficiency of intellectual capital investments as a potential leading indicator', *International Business & Economics Research Journal (IBER)*, Vol. 11, No. 5, pp.535–558, DOI: 10.19030/iber.v11i5.6972.

Jensen, C. and Meckling, H. (1976) 'Theory of the firm: managerial behavior, agency costs and ownership structure', Journal of Financial Economics, Vol. 3, No. 4, pp.305–360, DOI:10.1016/0304405x(76)90026-x

Kaplan, R.S. and Norton, D.P. (1992) 'The balanced scorecard – measures that drive performance', *Harvard Business Review*, Vol. 70, No. 1, pp.71–79.

Kim, J., Kim, S. and Lee, H. (2011) 'An effect of technology innovation activity on firm value and a mediation effect of leverage: evidence from Korean firms', *Asian Journal of Technology Innovation*, Vol. 19, No. 1, pp.37–51, DOI: 10.1080/19761597.2011.578430.

Lin, C.Y-Y. and Edvinsson, L. (2008) 'National intellectual capital: comparison of the Nordic countries', *Journal of Intellectual Capital*, Vol. 9, No. 4, pp.525–545, DOI: 10.1108/14691930810913140.

Liu, Q. and Wong, K.P. (2011) 'Intellectual capital and financing decisions: evidence from the U.S. patent data', *Management Science*, Vol. 57, No. 10, pp.1861–1878, DOI: 10.1287/mnsc.1110.1380.

Maditinos, D., Chatzoudes, D., Tsairidis, C. and Theriou, G. (2011) 'The impact of intellectual capital on firms' market value and financial performance', *Journal of Intellectual Capital*, Vol. 12, No. 1, pp.132–151, DOI: 10.1108/14691931111097944.

Maji, S.G. and Goswami, M. (2020) 'Is the influence of intellectual capital on firm performance homogeneous? Evidence from India employing quantile regression model', *International Journal of Learning and Intellectual Capital*, Vol. 17, No. 2, pp.187–211 [online] https://doi.org/10.1504/ijlic.2020.108897.

Modigliani, F. and Miller, M.H. (1958) 'Addison's anaemia', *The American Economic Review*, Vol. 48, pp.261–297, DOI: 10.1136/bmj.2.3594.952.

Modigliani, F. and Miller, M.H. (1963) 'Income taxes and the cost of capital', *The American Economic Review*, Vol. 53, No. 3, pp.433–443.

Ordóñez de Pablos, P. (2023) 'Editorial: building intellectual capital for the green transition and sustainable development', *International Journal of Learning and Intellectual Capital*, Vol. 20, No. 4, pp.351–354 [online] https://doi.org/10.1504/IJLIC.2023.134139.

Peng, Z., Johnstone, D. and Christodoulou, D. (2020) 'Asymmetric impact of earnings news on investor uncertainty', *Journal of Business Finance and Accounting*, Vol. 48, Nos. 1–2, pp.3–26, DOI: 10.1111/jbfa.12428.

Pulić, A. (2000) 'VAIC – an accounting tool for intellectual capital management', *International Journal Technology Management*, Vol. 20, Nos. 5–8, pp.702–714.

Pulić, A. (2004) 'Do we know if we create or destroy value?', *International Journal of Entrepreneurship and Innovation Management*, Vol. 4, No. 4, pp.349–359, DOI: 10.1504/IJEIM.2004.005479.

Pulić, A. (2008) *The Principles of Intellectual Capital Efficiency – A Brief Description*, No. 76, pp.1–24, Croatian Intellectual Capital Center.

Rehman, W. ul *et al.* (2011) 'Intellectual Capital Performance and Its Impact on Corporate Performance: an Empirical Evidence From Modaraba Sector of Pakistan.', *Australian Journal of Business and Management Research*, 01(05), pp. 08–16. Available at: https://doi.org/10.52283/nswrca.ajbmr.20110105a02.

Riahi-Belkaoui, A. (2003) 'Intellectual capital and firm performance of US multinational firms: a study of the resource-based and stakeholder views', *Journal of Intellectual Capital*, Vol. 4, No. 2, pp.215–226, DOI: 10.1108/14691930310472839.

Rosita et al. (2020) 'Intellectual capital and financial performance of state-owned banking: evidence from Indonesia', *International Journal of Learning and Intellectual Capital*, Vol. 17, No. 1, pp.47–60 [online] https://doi.org/10.1504/IJLIC.2020.105322.

Rossi, F. and Celenza, D. (2013) 'Ownership concentration, intellectual capital, and firm performance: evidence from Italy', *China-USA Business Review*, Vol. 12, No. 12, pp.1157–1174

Salvi, A., Vitolla, F., Raimo, N., Rubino, M. and Petruzzella, F. (2020) 'Does intellectual capital disclosure affect the cost of equity capital? An empirical analysis in the integrated reporting context', *Journal of Intellectual Capital*, Vol. 21, No. 6, pp.985–1007, DOI: 10.1108/JIC-12-2019-0283.

Sardo, F. and Serrasqueiro, Z. (2018) 'Intellectual capital, growth opportunities, and financial performance in European firms: dynamic panel data analysis', *Journal of Intellectual Capital*, Vol. 19, No. 4, pp.747–767, DOI: 10.1108/JIC-07-2017-0099.

Sharpe, W.F. (1964) 'American Finance Association capital asset prices: a theory of market equilibrium under conditions of risk', *The Journal of Finance*, Vol. 19, No. 3, pp.425–442.

Singla, H.K. (2020) 'Does VAIC affect the profitability and value of real estate and infrastructure firms in India? A panel data investigation', *Journal of Intellectual Capital*, Vol. 21, No. 3, pp.309–331, DOI: 10.1108/JIC-03-2019-0053.

Smriti, N. and Das, N. (2018) 'The impact of intellectual capital on firm performance: a study of Indian firms listed in COSPI', *Journal of Intellectual Capital*, Vol. 19, No. 5, pp.935–964, DOI: 10.1108/JIC-11-2017-0156.

Soewarno, N. and Tjahjadi, B. (2020) 'Measures that matter: an empirical investigation of intellectual capital and financial performance of banking firms in Indonesia', *Journal of Intellectual Capital*, Vol. 21, No. 6, pp.1085–1106, DOI: 10.1108/JIC-09-2019-0225.

Soriya, S. (2019) 'Performance of intellectual capital during pre and post crisis: a study of S&P CNX 500 companies', *International Journal of Learning and Intellectual Capital*, Vol. 16, No. 4, pp.399–419, DOI: 10.1504/IJLIC.2019.102649.

Stahle, P., Stahle, S. and Aho, S. (2011) 'Value added intellectual coefficient (VAIC): a critical analysis', *Journal of Intellectual Capital*, Vol. 12, No. 4, pp.531–551, DOI: 10.1108/14691931111181715.

Sveiby, K.E. (1997) 'The intangible assets monitor', *Journal of Human Resource Costing & Accounting*, Vol. 2, No. 1, pp.73–97, DOI: 10.1108/jhrca.2010.31614cac.001.

Tarsakoo, P. and Charoensukmongkol, P. (2020) 'Dimensions of social media marketing capabilities and their contribution to business performance of firms in Thailand', *Journal of Asia Business Studies*, Vol. 14, No. 4, pp.441–461, DOI: 10.1108/JABS-07-2018- 0204.

Tran, D.B. and Vo, D.H. (2018) 'Should bankers be concerned with Intellectual capital? A study of the Thai banking sector', *Journal of Intellectual Capital*, Vol. 19, No. 5, pp.897–914, DOI: 10.1108/JIC-12-2017-0185.

Tran, N.P., Van, L.T.H. and Vo, D.H. (2020) 'The nexus between corporate governance and intellectual capital in Vietnam', *Journal of Asia Business Studies*, Vol. 14, No. 5, pp.637–650, DOI: 10.1108/JABS-01-2020-0007.

Tripathy, T., Sahoo, D., Kesharwani, A. and Mishra, A.K. (2016) 'Competition, intellectual capital efficiency and firms' performance outcome in India: a structural equation modelling', *International Journal of Learning and Intellectual Capital*, Vol. 13, No. 1, pp.72–95, DOI: 10.1504/IJLIC.2016.074350.

Vale, J.A.F.L.O., Vale, V.C.F.T. and Lopes, V.S.C. (2022) 'Intellectual capital efficiency and financial performance in the hotel sector', *International Journal of Learning and Intellectual Capital*, Vol. 19, No. 1, pp.53–71 [online] https://doi.org/10.1504/IJLIC.2022.119276.

Van Horne, J.C. (1971) 'Management and policy implications', in *Financial Management and Policy*, 2nd ed., pp.1–709, Prentice-Hall, Inc., Englewood Cliffs, NJ, DOI: 10.5849/jof.12-915.

Vo, X.V. and Ellis, C. (2017) 'An empirical investigation of capital structure and firm value in Vietnam', *Finance Research Letters*, Vol. 22, pp.90–94, DOI: 10.1016/j.frl.2016.10.014.

Vrontis, D., Christofi, M., Battisti, E. and Graziano, E.A. (2020) 'Intellectual capital, knowledge sharing and equity crowdfunding', *Journal of Intellectual Capital*, Vol. 22, No. 1, pp.95–121, DOI: 10.1108/JIC-11-2019-0258.

Zéghal, D. and Maaloul, A. (2010) 'Analysing value added as an indicator of intellectual capital and its consequences on company performance', *Journal of Intellectual Capital*, Vol. 11, No. 1, pp.39–60, DOI: 10.1108/14691931011013325.

17% Overall Similarity

Top sources found in the following databases:

- 13% Internet database
- 13% Publications database
- Crossref database
- Crossref Posted Content database
- 0% Submitted Works database

TOP SOURCES

The sources with the highest number of matches within the submission. Overlapping sources will not be displayed.

1	Harmono Harmono, Sugeng Haryanto, Grahita Chandrarin, Prihat Assih... Crossref	1%
2	ijefm.co.in Internet	1%
3	researchgate.net Internet	<1%
4	ualresearchonline.arts.ac.uk Internet	<1%
5	Amelia Limijaya, Yanthi Hutagaol Martowidjojo, Elisabeth Hartanto. "Int... Crossref	<1%
6	inderscienceonline.com Internet	<1%
7	hdl.handle.net Internet	<1%
8	journal.um-surabaya.ac.id Internet	<1%

9	umpir.ump.edu.my Internet	<1%
10	article.sciencepg.com Internet	<1%
11	repository.uwl.ac.uk Internet	<1%
12	cmaaustralia.edu.au Internet	<1%
13	econjournals.com Internet	<1%
14	iiste.org Internet	<1%
15	repository.up.ac.za Internet	<1%
16	"Prelims", Emerald, 2023 Crossref	<1%
17	Marco Botta. "Currency change and capital structure decisions: eviden... Crossref	<1%
18	Mehtap Öner, Asli Aybars, Murat Çinko, Emin Avci. "Intellectual Capital,... Crossref	<1%
19	nova.newcastle.edu.au Internet	<1%
20	M. Kabir Hassan, Mamunur Rashid, Sirajo Aliyu. "Islamic Corporate Fin... Publication	<1%

21	eprints.unmer.ac.id Internet	<1%
22	openaccess.nhh.no Internet	<1%
23	Krishna Dayal Pandey, Tarak Nath Sahu. "Capital Structure, Equity Own... Publication	<1%
24	Springer Proceedings in Business and Economics, 2016. Crossref	<1%
25	escholarship.org Internet	<1%
26	Irwan Trinugroho, Evan Lau. "Business Innovation and Development in ... Publication	<1%
27	Yassine Maleh, Justin Zhang, Abderrahim Hansali. "Advances in Emerg... Publication	<1%
28	frontiersin.org Internet	<1%
29	Liangyu Zhu, Yulong Sun. "Accounting information quality and cash hol... Crossref	<1%
30	Muhammad Nadeem, Christopher Gan, Cuong Nguyen. "Does intellectu... Crossref	<1%
31	inderscience.com Internet	<1%
32	Faris Shalahuddin Zakiy, Falikhatun Falikhatun. "The role of intellectual... Crossref	<1%

33	Funmilola O. Omotayo, Ojinga G. Omiunu. "Intellectual capital manage... Crossref	<1%
34	Mahmoud, Fatima Bisola. "Intellectual Capital and Performance of Pub... Publication	<1%
35	Viktoria Goebel. "Estimating a measure of intellectual capital value to t... Crossref	<1%
36	emrbi.org Internet	<1%
37	rjoas.com Internet	<1%
38	"Current Issues in Economics and Finance", Springer Science and Busi... Crossref	<1%
39	Ahmed Jinjiri Bala, Aminu Hassan, Muhammad Liman Muhammad. "Do... Crossref	<1%
40	Ruud A.I. van Frederikslust, James S. Ang, P.S. Sudarsanam. "Corporat... Publication	<1%
41	acikbilim.yok.gov.tr Internet	<1%
42	media.neliti.com Internet	<1%
43	repository.ub.ac.id Internet	<1%
44	Angi Skhvediani, Anastasia Koklina, Tatiana Kudryavtseva, Diana Maks... Crossref	<1%

45	Filomena Izzo, Viktoriia Tomnyuk, Rosaria Lombardo. "4.0 digital transi... Crossref	<1%
46	Forte William, Matonti Gaetano, Nicolò Giuseppe. "The impact of intelle... Crossref	<1%
47	eprints.bbk.ac.uk Internet	<1%
48	etd.uum.edu.my Internet	<1%
49	journals.ums.ac.id Internet	<1%
50	open.uct.ac.za Internet	<1%
51	scidar.kg.ac.rs Internet	<1%
52	Akrum Helfaya, Ahmed Aboud, Essam Amin. "An Examination of Corpo... Crossref	<1%
53	Ali İhsan Akgün, Serap Pelin Türkoğlu. "Intellectual capital and perform... Crossref	<1%
54	Mahesh Joshi, Daryll Cahill, Jasvinder Sidhu, Monika Kansal. "Intellect... Crossref	<1%
55	Mike Wright, Ken Robbie. "Venture Capital", Routledge, 2022 Publication	<1%
56	Shahid Amin, Shoaib Aslam. "Intellectual Capital, Innovation and Firm ... Crossref	<1%

57	Stefania Vignini. "Chapter 886 Environmental Law", Springer Science a... Crossref	<1%
58	Stevo Janosevic, Vladimir Dzenopoljac. "The relevance of intellectual c... Crossref	<1%
59	Znar Ahmed, Muhammad Rosni Amir Hussin, Kashan Pirzada. "The Im... Crossref	<1%
60	academic-conferences.org Internet	<1%
61	bc.umcs.pl Internet	<1%
62	bircu-journal.com Internet	<1%
63	ebin.pub Internet	<1%
64	epubs.surrey.ac.uk Internet	<1%
65	ekof.bg.ac.rs Internet	<1%
66	incp.org.co Internet	<1%
67	scielo.sa.cr Internet	<1%
68	International Journal of Managerial Finance, Volume 9, Issue 1 (2013-0... Publication	<1%

69	Katper, Naveeda Akhter. "Determinants and Managerial Trustworthines... Publication	<1%
70	"Proceedings of the 2nd Advances in Business Research International ... Crossref	<1%
71	"The Dynamics of Intellectual Capital in Current Era", Springer Science ... Crossref	<1%
72	Cornelius Rante Langi, Sugeng Raharjo, Swadia Gandhi Mahardika, Adi ... Crossref	<1%
73	Duc Hong Vo, Ngoc Phu Tran. "Intellectual capital and bank performan... Crossref	<1%
74	Fawad Ahmad. "The Relationship Between Intellectual Capital, Financi... Crossref	<1%
75	Giuseppe Marzo, Stefano Bonnini. "Uncovering the non-linear associati... Crossref	<1%
76	Kaveh Asiaei, Omid Barani, Nick Bontis, Maryam Arabahmadi. "Unpacki... Crossref	<1%
77	Md. Jahidur Rahman, Hongyi Liu. "Intellectual capital and firm perform... Crossref	<1%
78	Златковић, Матеа В.. "Uticaj Intelektualnog Kapitala na Efektivnost Pr... Publication	<1%
79	bura.brunel.ac.uk Internet	<1%
80	eprints.umm.ac.id Internet	<1%

81	onlinelibrary.wiley.com Internet	<1%
82	Ahmed Mohamed Habib, Tamanna Dalwai. "Does the Efficiency of a Fir... Crossref	<1%
83	emeraldinsight.com Internet	<1%

Excluded from Similarity Report

- Bibliographic material
- Manually excluded text blocks

EXCLUDED TEXT BLOCKS

et al. (2019), therelationship between

www-emerald-com-443.webvpn.sxu.edu.cn

the relationship between the

www-emerald-com-443.webvpn.sxu.edu.cn

as a

www-emerald-com-443.webvpn.sxu.edu.cn

book value of liabilities

www-emerald-com-443.webvpn.sxu.edu.cn

to obtain a robust

eprints.unmer.ac.id

companieslisted on the Indonesian capital market

eprints.unmer.ac.id

Using purposive sampling

eprints.unmer.ac.id

International Journal of Learning and Intellectual CapitalISSN online: 1479-4861 - I...

www.inderscience.com

Insights on knowledge management and intellectual capitalfor a greener and digit...

econpapers.repec.org

Article History:Received:Accepted:Published online:14

www.inderscience.com

Department of Accounting,Faculty of Economics and Business,University of Merde...

iieta.org

Orcid ID: https://orcid.org/0000-0002-1933-5017

www.ijefm.co.in

Faculty of Islamic Economics and Business,State Islamic Institute (IAIN) Kediri

etheses.iainkediri.ac.id

capital employee efficiency(CEE

eprints.unmer.ac.id

Harmono is an Associate Professor as a Lecturer andsenior researcher in Econom...

eprints.unmer.ac.id

using Tobin’s Q, PER, and

eprints.unmer.ac.id

firm performance, leverage andfirm value

eprints.unmer.ac.id

Relationship between intellectual capital and leverage

eprints.unmer.ac.id

theinfluence of intellectual capital on

eprints.unmer.ac.id

Relationship between intellectual capital, firm performance and leverage

eprints.unmer.ac.id

et al., 2011

www.emeraldinsight.com

the relationship between intellectualcapital and

www.emeraldinsight.com

H1a There is

www.emeraldinsight.com

H1b There is a positive association between

www.emeraldinsight.com

There is a positive association between ‘value-added

www.emeraldinsight.com

H2a There is

www.emeraldinsight.com

There is a positive association between ‘value-added

www.emeraldinsight.com

H3a There is

www.emeraldinsight.com

H3b There is a positive association between

www.emeraldinsight.com

p = 0

www.emeraldinsight.com

Zéghal and Maaloul, 2010;Maditinos et al., 2011

www.emeraldinsight.com

the optimal capital structure theory

eprints.unmer.ac.id

Tobin’s Q, PER and PBV

eprints.unmer.ac.id

Vo and Ellis, 2017

eprints.unmer.ac.id

and leverage, with size

eprints.unmer.ac.id

CEEHCESCEROAROE

eprints.unmer.ac.id

with an average of0

eprints.unmer.ac.id

Thepattern of relationships between variables

eprints.unmer.ac.id

Tobin’s Q,PER and PBV, with

eprints.unmer.ac.id

whenmeasuring firm value using Tobin’sQ

eprints.unmer.ac.id

p = 0

eprints.unmer.ac.id

1Capital employeeefficiency (X1)2Human capitalefficiency

eprints.unmer.ac.id

Model 1a; 1b

Lei Guo, Kate Mays, Yiyan Zhang, Derry Wijaya, Margrit Betke. "What Makes Gun Violence a (Less) Prominen...

Model 5a;b, Model 6a;b

Lei Guo, Kate Mays, Yiyan Zhang, Derry Wijaya, Margrit Betke. "What Makes Gun Violence a (Less) Prominen...

VA ? HC ? SC

repository.uwl.ac.uk

If HCE = 1, or SCE = 0, then VA

repository.uwl.ac.uk

ICE ? HCE ? SCE ? HCE ???1?1HCE ???.???Or

repository.uwl.ac.uk

the productivity of knowledge workers

repository.uwl.ac.uk

Tobin’s Q. Tobin’s Q

repository.uwl.ac.uk

Iazzolino and Laise, 2013

Springer Proceedings in Business and Economics, 2016.

firm value measured by Tobin’s Q

Tifanny Dwijaya Hendratama, Zuni Barokah. "Related party transactions and firm value: The moderating role...

firm value measured

Tifanny Dwijaya Hendratama, Zuni Barokah. "Related party transactions and firm value: The moderating role...

There is a positive

Cătălin Gabriel Ioniţă. "The need for rethinking the model of assessing value in the digital economy context",...

There is a positive

Cătălin Gabriel Ioniţă. "The need for rethinking the model of assessing value in the digital economy context",...

and firm value (Tobin’s Q)based on

nova.newcastle.edu.au

There is

nova.newcastle.edu.au

VAIC = {CEE, HCE, SCE}, 3 ? VAIC to

Syed Quaid Ali Shah, Fong-Woon Lai, Muhammad Kashif Shad, Zdeňka Konečná et al. "The Inclusion of Intel...

Then:?1

Journal of Intellectual Capital, Volume 14, Issue 4 (2013-10-12)

1 ? HC

repository.uwl.ac.uk

Effect of

John Kwaku Mensah Mawutor, Isaac Boadi, Samuel Antwi, Anthony Buawolor Tetteh. "Improving banks' pro...

et al

Monika Barak, Rakesh Kumar Sharma. "Does intellectual capital impact the financial performance of Indian ...

Tobin's Q

Monika Barak, Rakesh Kumar Sharma. "Does intellectual capital impact the financial performance of Indian ...

Tobin's Q

Monika Barak, Rakesh Kumar Sharma. "Does intellectual capital impact the financial performance of Indian ...

as an intervening variablebetween the

Harmono Harmono, Sugeng Haryanto, Grahita Chandrarin, Prihat Assih. "Financial Performance and Owners...

of VAIC

Rumeysa Bilgin. "A machine learning analysis of the value-added intellectual coefficient's effect on firm perf...

of VAIC and its

Rumeysa Bilgin. "A machine learning analysis of the value-added intellectual coefficient's effect on firm perf...

Harris and Raviv, 1991

dro.deakin.edu.au

Tran and Vo, 2018; Smriti and Das, 2018

Harishankar Vidyarthi, Ranjit Tiwari. "Cost, revenue, and profit efficiency characteristics, and intellectual capi...

Stahle

Harishankar Vidyarthi, Ranjit Tiwari. "Cost, revenue, and profit efficiency characteristics, and intellectual capi...

i,t ? ?0

moam.info

manufacturing companies that wentpublic in the Indonesian capital market

Harmono Harmono, Sugeng Haryanto, Grahita Chandrarin, Prihat Assih. "Financial Performance and Owners...

as follow:VA ? OUT ? INOUT = total

Shiri, Mahmoud Mousavi, and Khadijeh Mousavi. "Relationship between intellectual capital with productivity ...

Value-added can be

www.scribd.com

Riahi-Belkaoui, 2003; Chen et al., 2005

Harish Kumar Singla. "Does VAIC affect the profitability and value of real estate and infrastructure firms in I...

which is calculated by

Harish Kumar Singla. "Does VAIC affect the profitability and value of real estate and infrastructure firms in I...

as:VAIC ? HCE ? SCE ? CEE

Harish Kumar Singla. "Does VAIC affect the profitability and value of real estate and infrastructure firms in I...

et al

Harish Kumar Singla. "Does VAIC affect the profitability and value of real estate and infrastructure firms in I...