
The Influence Of Firm Size, Firm Age and Leverage On Intellectual Capital Disclosure

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Abstract:

The disclosure of intellectual capital an intangible asset category governed by PSAK No. 19 (Revised 2009) is typically reported within a firm's annual report. Such reporting customarily addresses three principal dimensions: human capital, structural capital, and relational capital. This research investigates whether firm size, firm age, and financial leverage exert significant effects on the extent of intellectual capital disclosure. The study population comprises property and real-estate firms listed on the Indonesia Stock Exchange over the 2020–2024 period. Using purposive sampling, the research selects 33 firms, yielding 165 panel observations. A quantitative methodology and panel regression analysis are implemented with EViews 12 to test the hypotheses. The findings are intended to illuminate determinants of intellectual capital disclosure for practitioners and to underscore the need for firms to monitor evolving disclosure requirements and standards pertaining to intangible information.

Keywords: firm size , firm age,intellectual capital disclosure, leverage

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1. Introduction

According to Law No. 8 of 1995 Article 4, the Indonesia Stock Exchange (IDX) functions as the regulatory body overseeing the public offering and trading of securities, ensuring fair, orderly, and efficient transactions among market participants (Indonesia Stock Exchange, 2023). Companies that go public have their shares listed on the IDX, allowing investors to access their annual reports and disclosures. Between 2020 and 2024, the number of property and real estate firms listed on the IDX increased from 79 to 92, reflecting consistent sectoral growth. The sector's contribution to Indonesia's GDP also showed a steady rise, from approximately IDR 450 trillion in 2020 to IDR 505 trillion in 2023, although it slightly slowed to IDR 507 trillion in 2024 due to oversupply in certain sub-sectors and post-pandemic shifts in consumer preferences. Despite these challenges, fiscal incentives, particularly for landed housing, have continued to sustain demand.

In the digital economy, firms are increasingly driven not only by tangible assets but also by intangible assets that create sustainable competitive advantage

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(Wahyuningtyas et al., 2018; Hatane et al., 2018). Among these, intellectual capital (IC)—which comprises human, structural, and relational capital—is widely recognized as a strategic resource that enhances innovation, operational efficiency, and financial performance (Kurniawati et al., 2020; Ulum, 2015). Intellectual capital includes a company's collective knowledge, employee skills, technological capabilities, and stakeholder relationships that together drive value creation (Setiawan & Prawira, 2018, as cited in Kurniawati et al., 2020).

Transparency in disclosing intellectual capital is increasingly essential in corporate governance, as it provides stakeholders with insights into how organizations manage and leverage knowledge-based resources (Anna & Dwi RT, 2018; Elly Tulung et al., 2018). Under PSAK No. 19 (Revised 2009), firms are encouraged to disclose intangible assets, including IC, in their annual reports. However, disclosure remains largely voluntary, resulting in variations in practice across sectors (Sari et al., 2019). Prior studies demonstrate that intellectual capital disclosure (ICD) can enhance investor confidence and firm valuation (Rivandi & Septiano, 2021; Rambe et al., 2020) while contributing to ethical and managerial transparency (Anna & Dwi RT, 2018).

Despite the growing recognition of intellectual capital, the level of ICD in Indonesia remains inconsistent and relatively low compared to global standards (Fauziah & Murharsito, 2021; Suzan & Nurhakim, 2023). For instance, data from 2020–2024 show that no property or real estate firm disclosed more than 80% of possible IC items. Bekasi Asri Pemula Tbk disclosed the fewest (15–18 items, 0.23–0.28 disclosure index), while Pakuwon Jati Tbk reported the most (32–35 items, 0.43–0.54 index). Similar variation is observed across Agung Podomoro Land Tbk, Bukit Darmo Property Tbk, and Kawasan Industri Jababeka Tbk, highlighting inconsistencies in reporting human, structural, and relational capital components. This limited disclosure suggests that firms may still underestimate the role of IC in signaling performance to investors (Mulyana & Daito, 2021; Tang & Angeline, 2022).

Several firm-specific factors are known to influence the extent of ICD. Firm size is one of the most widely examined determinants, with larger firms typically having more complex operations, stronger stakeholder pressures, and higher visibility, leading to greater disclosure levels (Fauziah & Murharsito, 2021; Tang & Angeline, 2022). However, some studies show an insignificant or negative relationship, suggesting that larger firms may selectively disclose information to maintain strategic advantages (Mulyana & Daito, 2021; Suzan & Anisha, 2024). Firm age has also been shown to influence ICD; older firms are likely to have more established reporting systems and reputational concerns that encourage disclosure (Novrian et al., 2020; Inayah & Difa, 2024), although some sectors such as infrastructure and utilities show the opposite trend, where older firms disclose less due to rigid bureaucratic structures (Dewi & Nahar, 2020).

Another determinant, leverage, reflects financial risk and creditor monitoring. Firms with higher leverage may disclose more IC information to reduce information asymmetry and reassure creditors (Mujiani et al., 2020; Herlina et al., 2021).

However, some studies find no significant link, as leveraged firms may prioritize internal resource utilization over external reporting (Suzan & Nurhakim, 2023; Sariningsih & Saputro, 2021). Moreover, previous findings across industries remain inconsistent, suggesting that contextual factors—such as governance structures, audit types, and industry characteristics—mediate these relationships (Joson & Susanti, 2017; Widiatmoko et al., 2020).

These inconsistencies indicate a research gap in understanding how firm size, firm age, and leverage jointly influence ICD, particularly in capital-intensive sectors like property and real estate, where knowledge assets, managerial expertise, and stakeholder relations are crucial for value creation (Anggraeni, 2021; Mulyana & Daito, 2021). Most prior studies have focused on manufacturing, banking, or service sectors (Elly Tulung et al., 2018; Kurniawati et al., 2020), leaving limited empirical evidence for property firms that face unique disclosure dynamics due to project-based operations and investor dependency (Suzan & Anisha, 2024).

Hence, this study aims to fill the gap by examining the effect of firm size, firm age, and leverage on intellectual capital disclosure in property and real estate companies listed on the Indonesia Stock Exchange during 2020–2024. The novelty of this research lies in integrating these three determinants simultaneously within a single sectoral analysis and period marked by post-pandemic recovery and digital transformation, where intellectual assets have become central to corporate sustainability and transparency in Indonesia's capital market context.

2. Theoretical Background

Stakeholder Theory

Stakeholder theory emphasizes that a company's responsibilities extend beyond shareholders to include all stakeholders such as employees, customers, the government, the community, and creditors. This theory explains that the management of company resources should consider the interests of all parties who can influence or be influenced by the firm's activities (Anna & Dwi RT, 2018). Within the context of corporate reporting, this theory provides a foundation for *intellectual capital disclosure* (ICD), as transparent reporting helps reduce information asymmetry between internal and external stakeholders (Rambe et al., 2020).

As intangible assets increasingly contribute to corporate profitability, management has recognized the importance of disclosing intellectual capital to provide a more accurate representation of a company's value and performance (Widiatmoko et al., 2020). Intellectual capital plays a vital role in strengthening corporate competitiveness and improving performance, especially in knowledge-based sectors such as property and real estate, which require innovation and managerial capability (Wahyuningtyas et al., 2018). Therefore, intellectual capital disclosure serves not only as an ethical responsibility to stakeholders but also as a managerial strategy to enhance investor confidence and firm value in the capital market (Elly Tulung et al., 2018; Rivandi & Septiano, 2021).

Intellectual Capital Disclosure, Firm Size, Firm Age, and Leverage

According to Indonesia's financial market regulation, public companies are required to disclose both financial and non-financial information in their annual reports to ensure transparency for stakeholders (Widiatmoko et al., 2020). One key element of non-financial disclosure is *intellectual capital disclosure* (ICD), which provides a more comprehensive picture of a firm's intangible resources. Ulum (2015) proposed an ICD model consistent with Indonesian reporting standards, classifying intellectual capital into three main components: **human capital** (8 items), **structural capital** (15 items), and **relational capital** (13 items). The extent of disclosure is commonly assessed using a *four-way numerical coding system*, evaluating whether each item is presented descriptively, numerically, or monetarily.

Firm size reflects a company's operational scale and resource capacity and often indicates its ability to manage resources effectively and attract investment (Fauziah & Murharsito, 2021). Larger firms generally exhibit higher levels of ICD due to greater public visibility and stronger investor demands for transparency (Hatane et al., 2018; Sariningsih & Saputro, 2021). In this study, firm size is measured as the natural logarithm of total assets.

Firm age represents a company's operational maturity and experience, which often lead to improved governance and transparency practices. Older firms tend to disclose more intellectual capital information to demonstrate their accountability to stakeholders (Novrian et al., 2020; Anggraeni, 2021). However, some research has found that older firms may also show conservative disclosure behavior, resulting in a weaker relationship between firm age and ICD (Mulyana & Daito, 2021; Inayah & Difa, 2024).

Leverage reflects the degree of debt financing used in company operations and serves as a proxy for financial risk. Firms with higher leverage are often motivated to disclose more information to reassure creditors about their ability to meet debt obligations (Mujiani et al., 2020). Nonetheless, other studies have reported an insignificant or even negative effect, arguing that leverage does not necessarily drive disclosure since intellectual capital information is often utilized internally rather than for external financing purposes (Suzan & Nurhakim, 2023; Dewi & Nahar, 2020). In this study, leverage is measured using the *Debt-to-Equity Ratio* (DER), calculated as total debt divided by total equity.

Therefore, this study adopts the *stakeholder theory* as its underlying framework and employs the intellectual capital disclosure model proposed by Ulum (2015) to examine how firm size, firm age, and leverage influence the level of intellectual capital disclosure among property and real estate companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period.

Research Hypothesis

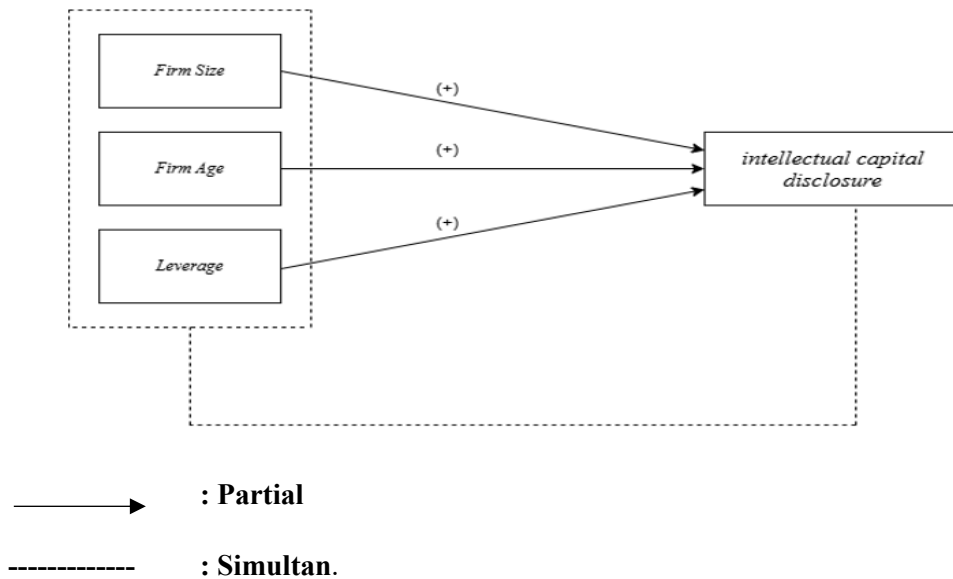


Figure 1. Conceptual Framework

Source: Data processed by the author (2025)

- H1: Firm size, firm age, and leverage simultaneously influence intellectual capital disclosure in property and real estate companies listed on the Indonesia Stock Exchange during the 2020-2024 period.
- H2: Firm size partially positively influences intellectual capital disclosure in property and real estate companies listed on the Indonesia Stock Exchange during the 2020-2024 period.
- H3: Firm age partially positively influences intellectual capital disclosure in property and real estate companies listed on the Indonesia Stock Exchange during the 2020-2024 period.
- H4: Leverage partially positively influences intellectual capital disclosure in property and real estate companies listed on the Indonesia Stock Exchange during the 2020-2024 period.

3. Methodology

This research adopts a quantitative methodology with a deductive theoretical framework to investigate how firm size, firm age, and leverage affect intellectual capital disclosure among property and real estate companies listed on the Indonesia Stock Exchange for the period 2020–2024. A case study approach is implemented in a real-world context, integrating both cross-sectional and time-series data across five years. Observations are selected using purposive sampling to ensure representativeness. Intellectual capital disclosure is assessed using the Framework for Intellectual Capital Disclosure, modified to comply with Indonesian regulations. Firm size is measured as the natural logarithm of total assets, firm age is determined based

on the year of establishment or IPO, and leverage is proxied by the debt-to-equity ratio. Data were collected from company annual reports, IDX publications, and relevant literature, while preliminary observation and theoretical framework development guided hypothesis formulation. Quantitative analysis involved descriptive statistics and panel data regression, with model selection based on Chow, Hausman, and Lagrange Multiplier tests, and classical assumption tests including multicollinearity and heteroskedasticity. Hypotheses were tested both simultaneously and partially at a 95% confidence level, with the coefficient of determination assessing the explanatory power of the independent variables, ensuring an empirically rigorous and comprehensive analysis.

4. Empirical Findings/Result

Descriptive Statistical Analysis

Descriptive statistics serve as a technique for examining data by organizing or summarizing raw information to provide a comprehensive overview of its attributes (Sugiyono, 2018). In the present research, descriptive statistics are applied to depict the characteristics of ratio-based variables, namely firm size, firm age, and leverage. The dataset comprises secondary data sourced from the financial reports of companies in the property and real estate sector listed on the Indonesia Stock Exchange over the period 2020–2024. The subsequent section elaborates on the results of the descriptive statistical analysis conducted in this study.

Table 1.
Results of Descriptive Statistical Analysis

Information	ICD	FS	FA	LV
Mean	0.4079	28.2842	19.4242	0.8838
Maximum	0.56250	31.96206	35.0000	7.30610
Minimum	0.2344	23.1640	1.0000	0.0093
Std Dev	0.0696	2.3674	9.4159	0.9896

Source: Eviews 12, Data processed by the author (2025)

Table 1 displays the descriptive statistics for both dependent and independent variables. The dependent variable, Intellectual Capital Disclosure (ICD), among property and real estate firms listed on the Indonesia Stock Exchange (IDX) from 2020 to 2024, exhibits an average value of 0.4079 with a standard deviation of 0.06, suggesting that the data are fairly consistent. The highest ICD value, 0.5625, was recorded by PT Pura Delta Lestari Tbk (DMAS) in 2024, while the lowest, 0.2344, was observed in PT Bekasi Asri Pemula Tbk (BAPA) in 2020. The first independent variable, firm size, measured by total assets, shows a mean of 28.2842 and a standard deviation of 2.37, with the maximum value of 31.9621 held by PT Bumi Serpong Damai Tbk (BSDE) in 2024 due to its high cash, inventories, short-term investments, receivables, goodwill, and tax receivables, and the minimum of 23.16 by PT Jaya Real Property (JRPT) in 2020. Firm age, the second independent variable, has a mean of 19.42 and a standard deviation of 9.41, indicating low variability; the oldest companies, PT Star Pacific (LPLI) and PT Pakuwon Jati (PWON), reached 35 years in 2024, whereas PT Bima Sakti Pertiwi (PMAG) was only 1 year old in 2020. Finally,

leverage, proxied by the debt-to-equity ratio (DER), has a mean of 0.88 and a standard deviation of 0.98, reflecting heterogeneous data. The highest DER, 7.306, was observed in PT PP Properti (PPRO) in 2024 due to its high debt relative to equity, while the lowest, 0.009, was recorded by PT Star Pacific (LPLI), reflecting minimal debt compared to equity.

Intellectual capital disclosure

The outcomes of the descriptive statistical evaluation pertaining to the intellectual capital disclosure construct are presented below:

Table 2.
Descriptive Statistics for Intellectual Capital Disclosure

CODE	2020	2021	2022	2023	2024
APLN	0,4843	0,375	0,4218	0,5	0,5
ASRI	0,4843	0,4843	0,5	0,4843	0,4531
BAPA	0,2343	0,2812	0,2656	0,2812	0,2656
BCIP	0,2812	0,3593	0,3593	0,3593	0,3281
BEST	0,4062	0,4531	0,4375	0,4531	0,3906
BKDP	0,3906	0,3906	0,3906	0,3906	0,3906
BSDE	0,3437	0,4218	0,4062	0,3906	0,3906
CTRA	0,4531	0,4375	0,4375	0,4218	0,4375
DILD	0,4687	0,4687	0,4375	0,4531	0,4687
DMAS	0,3593	0,4375	0,4062	0,4375	0,5625
DUTI	0,3281	0,4218	0,3906	0,375	0,375
ELTY	0,4531	0,4687	0,4843	0,4531	0,4687
EMDE	0,3906	0,3125	0,4687	0,4687	0,4531
FMII	0,2968	0,3593	0,3593	0,3593	0,3437
GMTD	0,3906	0,4218	0,4218	0,4375	0,4218
GPRA	0,3906	0,4531	0,46875	0,5156	0,5156
INPP	0,5625	0,5156	0,5	0,3437	0,375
JRPT	0,4375	0,4062	0,4375	0,4218	0,4843
KIJA	0,2656	0,3593	0,3437	0,3906	0,5
LPCK	0,4843	0,4531	0,4062	0,4062	0,3437
LPKR	0,375	0,4531	0,4531	0,3593	0,375
LPLI	0,2968	0,3437	0,3281	0,3437	0,3281
MDLN	0,5	0,375	0,4062	0,375	0,375
MKPI	0,3437	0,3437	0,3593	0,375	0,375
MTLA	0,5156	0,4843	0,5	0,5156	0,5
OMRE	0,3125	0,3593	0,3437	0,3437	0,3281
PAMG	0,2968	0,3437	0,4375	0,5156	0,4843
PPRO	0,5468	0,4062	0,4062	0,4218	0,4062
PWON	0,5	0,5468	0,5312	0,5312	0,4375
RDTX	0,25	0,2968	0,3281	0,3437	0,3437
SATU	0,2812	0,3281	0,3906	0,375	0,3437
SMRA	0,3437	0,3593	0,4531	0,4375	0,4375
TARA	0,40625	0,40625	0,40625	0,40625	0,40625
Maksimum	0,5625	0,5468	0,5312	0,5312	0,5625
Minimum	0,2343	0,2812	0,2656	0,2812	0,2656
Mean	0,3902	0,4038	0,4157	0,4157	0,4142
Std. Dev	0,0908	0,0638	0,0588	0,0615	0,0687

Source: Eviews 12, Data processed by the author (2025)

Based on Table 2, the dependent variable, intellectual capital disclosure (ICD), exhibited a fluctuating trend, increasing from 2020 to 2022 and declining from 2022 to 2024. The highest average was recorded in 2022 at 0.4157, while the lowest was in 2020 at 0.3901. In 2020, the mean of 0.39 exceeded the standard deviation of 0.09, indicating data homogeneity. The maximum ICD value of 0.5625 was observed in Indonesian Paradise Property (INPP), with 36 disclosed items, including 7 human capital, 9 structural capital, and 9 relational capital items, reflecting relatively high disclosure. The minimum value of 0.23 belonged to PT Bekasi Asri Pemula Tbk (BAPA) with 15 disclosed items (3 human, 7 structural, 2 relational), indicating low disclosure. In 2021, the mean ICD was 0.40 with a standard deviation of 0.06, showing homogeneity. PT Pakuwon Jati (PWON) reported the maximum value of 0.54 with 35 disclosed items (7 human, 6 structural, 8 relational), while BAPA had the minimum of 0.28 (18 items), representing a 5% increase from 2020. In 2022, the mean increased to 0.41 with SD 0.05, with PWON again showing the highest disclosure (0.53, 34 items: 7 human, 7 structural, 7 relational) and BAPA the lowest (0.26, 17 items: 3 human, 8 structural, 3 relational). Similar patterns persisted in 2023 (mean 0.41, SD 0.06), with PWON at 0.53 and BAPA at 0.28. In 2024, the mean remained 0.41 (SD 0.06), the highest disclosure reached 0.56 by PT Puradelta Lestari (DMAS) with 36 items (7 human, 8 structural, 8 relational), while BAPA remained the lowest at 0.26 (17 items), consistently indicating relatively high disclosure by leading firms and relatively low disclosure by BAPA across the observed period.

Firm size

The following are the results of the descriptive statistical analysis of the firm size variable:

Table 3.
Descriptive Statistics for Firm Size

CODE	2020	2021	2022	2023	2024
APLN	24,1374	24,1114	24,0772	24,0671	23,9859
ASRI	23,7785	23,8113	23,8278	23,8249	23,8151
BAPA	25,6812	25,6618	25,6317	25,6275	25,61121
BCIP	27,5359	27,5111	27,5077	27,5374	27,54274
BEST	29,4687	29,4304	29,4357	29,4127	29,39356
BKDP	27,3963	27,3750	27,3519	27,3542	27,34633
BSDE	31,7396	31,7495	31,8054	31,8331	31,96206
CTRA	31,3011	31,3364	31,3694	31,4178	31,48165
DILD	30,3848	30,4320	30,4253	30,3123	30,24868
DMAS	29,5408	29,4415	29,5216	29,5358	29,7418
DUTI	30,2523	30,3594	30,3774	30,3478	30,29563
ELTY	30,1011	30,089	29,9249	29,7873	29,79916
EMDE	28,5287	28,9470	28,9511	28,8892	28,95218
FMII	27,4925	27,4906	27,3471	27,3855	27,3791
GMTD	27,6182	27,7014	27,7802	27,8166	27,88882
GPRA	28,1776	28,1966	28,2084	28,3010	28,31042
INPP	29,6666	29,7995	29,8462	29,8658	29,90468
JRPT	23,164	23,1869	23,2289	23,3040	23,36963
KIJA	30,1324	30,1399	30,2044	30,1919	30,27132

LPCCK	29,9051	29,8430	29,8663	29,9012	30,2417
LPKR	31,5796	31,5838	31,5404	31,5344	31,61599
LPLI	27,5640	27,6047	27,7492	28,152	28,20098
MDLN	30,3290	30,3078	30,2358	30,2476	30,23825
MKPI	29,6621	29,7097	29,7297	29,7579	29,8215
MTLA	29,4114	29,4888	29,5384	29,6079	29,63729
OMRE	29,0502	29,0442	29,0147	29,0209	29,02272
PAMG	27,0911	27,0924	27,0907	27,0908	27,09993
PPRO	30,5486	30,6796	30,7135	30,6113	30,53476
PWON	23,9988	24,0859	24,1443	24,2109	24,28916
RDTX	28,7199	28,7819	28,8510	28,8665	28,86855
SATU	26,2862	26,2818	26,1954	26,1628	26,08643
SMRA	23,9390	23,9832	24,0708	24,1626	24,23583
TARA	27,7140	27,7128	27,7082	27,7063	27,7049
Maksimum	31,7396	31,7495	31,8054	31,8331	31,9620
Minimum	23,1640	23,1869	23,2289	23,3040	23,3696
Mean	28,2393	28,2718	28,2809	28,2983	28,3302
Std. Dev	2,3985	2,4031	2,4004	2,3813	2,3994

Source: Eviews 12, Data processed by the author (2025)

Table 3, the independent variable firm size shows a consistent upward trend in average values from 2020 to 2024, ranging from 28.23 in 2020 to 28.33 in 2024, all exceeding the respective standard deviations (around 2.38–2.40), indicating data homogeneity. The maximum values each year were consistently recorded by PT Bumi Serpong Damai (BSDE), increasing from 31.73 in 2020 to 31.96 in 2024, driven by growth in total assets including cash and cash equivalents, inventories, short-term investments, receivables, goodwill, and tax receivables. Conversely, the minimum values were held by PT Jaya Real Property (JRPT), rising from 23.16 in 2020 to 23.36 in 2024, reflecting relatively smaller total assets and lower cash and cash equivalents. Overall, firm size demonstrates gradual growth across the observed period, with BSDE consistently leading in asset size and JRPT at the lower end.

Firm age

The outcomes of the descriptive statistical assessment for the variable representing firm age are presented below:

Table 4.
Descriptive Statistics for Firm Age

CODE	2020	2021	2022	2023	2024
APLN	10	11	12	13	14
ASRI	13	14	15	16	17
BAPA	12	13	14	15	16
BCIP	11	12	13	14	15
BEST	8	9	10	11	12
BKDP	13	14	15	16	17
BSDE	12	13	14	15	16
CTRA	26	27	28	29	30
DILD	29	30	31	32	33
DMAS	5	6	7	8	9
DUTI	26	27	28	29	30

ELTY	25	26	27	28	29
EMDE	9	10	11	12	13
FMII	20	21	22	23	24
GMTD	20	21	22	23	24
GPRA	13	14	15	16	17
INPP	16	17	18	19	20
JRPT	26	27	28	29	30
KIJA	25	26	27	28	29
LPCK	23	24	25	26	27
LPKR	24	25	26	27	28
LPLI	31	32	33	34	35
MDLN	27	28	29	30	31
MKPI	11	12	13	14	15
MTLA	9	10	11	12	13
OMRE	26	27	28	29	30
PAMG	1	2	3	4	5
PPRO	5	6	7	8	9
PWON	31	32	33	34	35
RDTX	30	31	32	33	34
SATU	2	3	4	5	6
SMRA	30	31	32	33	34
TARA	6	7	8	9	10
Maksimum	31,0000	32,0000	33,0000	34,0000	35,0000
Minimum	1,0000	2,0000	3,0000	4,0000	5,0000
Mean	17,4242	18,4242	19,4242	20,4242	21,4242
Std. Dev	9,4241	9,4241	9,4241	9,4241	9,4241

Source: Eviews 12, Data processed by the author (2025)

Based on Table 4, the independent variable *firm age* shows a consistent upward trend from 2020 to 2024. The average increased from 17.42 in 2020 to 21.42 in 2024, always exceeding the standard deviation of 9.42, indicating homogeneous data throughout the period. The maximum values were consistently recorded by PT Star Pacific (LPLI) and PT Pakuwon Jati (PWON), rising from 31 in 2020 to 35 in 2024, while the minimum values belonged to PT Bima Sakti Pertiwi (PAMG), increasing from 1 in 2020 to 5 in 2024.

Leverage

Presented below are the findings from the descriptive statistical examination of the leverage variable:

Table 5.
Descriptive Statistics for Leverage

CODE	2020	2021	2022	2023	2024
APLN	1,6764	1,8094	1,2950	1,1059	0,8949
ASRI	1,2615	1,3001	1,0952	0,9728	0,9424
BAPA	0,0603	0,0541	0,0511	0,0720	0,099
BCIP	1,0360	0,9858	0,9062	0,8932	0,8541
BEST	0,4419	0,4080	0,4042	0,3599	0,3165
BKDP	0,6430	0,7335	0,8306	0,9853	1,1756
BSDE	0,7656	0,7125	0,7084	0,6219	0,6066
CTRA	1,2486	1,0969	1,0001	0,9498	0,9103

DILD	1,5956	1,7290	1,6307	1,2332	1,0310
DMAS	0,2214	0,1425	0,1569	0,1425	0,1441
DUTI	0,3313	0,3966	0,4264	0,3202	0,2102
ELTY	0,4015	0,4336	0,3689	0,4090	0,4511
EMDE	3,4752	1,1998	1,3020	1,5915	0,9935
FMII	0,3927	0,3670	0,1547	0,1688	0,1436
GMTD	0,6879	0,9260	1,0495	0,7290	0,5574
GPRA	0,6400	0,5919	0,5115	0,5407	0,4421
INPP	0,3265	0,5294	0,5965	0,5763	0,5431
JRPT	0,4579	0,4408	0,4193	0,4245	0,3935
KIJA	0,9488	0,9290	1,0153	0,867946	0,8593
LPCK	0,4773	0,4257	0,3964	0,4256	1,2791
LPKR	1,2001	1,3161	1,6056	1,5282	0,7379
LPLI	0,2650	0,0126	0,0127	0,0418	0,0092
MDLN	2,5187	2,4749	2,2015	2,3251	2,9270
MKPI	0,3594	0,3697	0,2684	0,2243	0,2191
MTLA	0,4551	0,4546	0,4166	0,4023	0,3301
OMRE	0,1645	0,2136	0,2617	0,1141	0,1597
PAMG	0,3385	0,3698	0,3778	0,3766	0,3712
PPRO	3,1546	3,6878	3,7882	4,9917	7,3061
PWON	0,5034	0,5051	0,4770	0,4349	0,4295
RDTX	0,0856	0,0882	0,1395	0,1924	0,1343
SATU	2,0239	2,7527	2,8939	3,0233	3,3587
SMRA	1,7430	1,31960	1,4198	1,5333	1,4242
TARA	0,0436	0,0212	0,0194	0,0200	0,0205
Maksimum	3,4752	3,6878	3,7882	4,9917	7,3061
Minimum	0,0436	0,0127	0,0127	0,0201	0,0093
Mean	0,9074	0,8730	0,8546	0,8666	0,9175
Std. Dev	0,8689	0,8365	0,8409	0,9994	1,3615

Source: Eviews 12, Data processed by the author (2025)

Table 5, the leverage variable exhibits fluctuating patterns in annual averages. The highest average was recorded in 2024 at 0.91, while the lowest occurred in 2022 at 0.85. In 2020, the average of 0.90 exceeded the standard deviation of 0.86, indicating homogenous data, with a maximum of 3.47 for PT Megapolitan Development (EMDE) and a minimum of 0.04 for PT Agung Semesta Sejahtera (TARA). In 2021, the average was 0.87 with a standard deviation of 0.83, showing homogeneity, with a maximum of 3.68 at PT PP Properti (PPRO) and a minimum of 0.01 at PT Star Pacific (LPLI). In 2022, the average leverage of 0.85 remained higher than the standard deviation of 0.84, confirming homogeneity, with a maximum of 3.78 (PPRO) and a minimum of 0.01 (LPLI). In 2023, the average slightly increased to 0.86, but the standard deviation of 0.99 indicated heterogeneity, with a maximum of 4.99 (PPRO) and a minimum of 0.02 (Agung Semesta Sejahtera). Finally, in 2024, the average rose to 0.91 with a standard deviation of 1.36, still reflecting heterogeneity, with a maximum of 7.30 (PPRO) and a minimum of 0.009 (LPLI).

Classical Assumption Test

In this research, the classical assumption tests for linear regression analysis encompassed assessments of multicollinearity and heteroskedasticity (Basuki & Prawoto, 2016). The multicollinearity test evaluates the degree of correlation among the independent variables, typically measured using the centered Variance Inflation Factor (VIF). A VIF value below 10 indicates the absence of multicollinearity, whereas a value exceeding 10 signals its existence. The analysis of the independent variables firm size, firm age, and leverage revealed centered VIF values under 10, suggesting that multicollinearity is not an issue and that the predictors are not highly linearly correlated.

Heteroskedasticity testing evaluates whether the variance of residuals is constant across observations. If residual variance is equal for all observations, the model is homoskedastic and considered appropriate. Using the Harvey test, the chi-square probability value obtained was 0.14, which is greater than the 0.05 threshold, indicating no heteroskedasticity. This result demonstrates that the residual variance is constant, and thus the regression model meets the assumption of being free from heteroskedasticity.

Regression Model Selection

Chow Test

In this study, the Chow test was conducted by comparing the common effect and fixed effect models. The null hypothesis (H_0) assumes a common effect model, while the alternative hypothesis (H_1) assumes a fixed effect model. The rule for deciding the model is as follows: if the p-value of the cross-sectional chi-square test exceeds 0.05, the null hypothesis is not rejected, suggesting that the common effect model is appropriate. Conversely, if the p-value is 0.05 or lower, the null hypothesis is rejected, favoring the fixed effect model.

Table 6.
Chow Test

Effect Test	Statistic	d.f.	Prob
Cross-section F	8.299349	(32, 129)	0.0000
Cross-section Chi-Square	184.471220	32	0.0000

According to Table 6, the Chow test produces a Cross-Section Chi-Square Probability of 0.00, which falls below the 0.05 significance threshold. Based on the criteria for Chow hypothesis testing, this result leads to the rejection of the null hypothesis (H_0). Consequently, the Fixed Effect Model (FEM) is deemed the most suitable approach for this study.

Hausman test

In this research, the Hausman test was applied to determine the suitability between the random effects model and the fixed effects model. The null hypothesis (H_0) posits that the random effects model is appropriate, whereas the alternative hypothesis (H_1) suggests that the fixed effects model is more suitable. The decision rule states that if the cross-sectional chi-square probability exceeds 0.05, H_0 is not rejected and the

random effects model is preferred; conversely, if the probability is 0.05 or below, H_0 is rejected in favor of the fixed effects model.

Table 7.
Hausman Test

Test summary	Chi-Sq Statistic	Chi-Sq d.f.	Prob
Cross-section Random	9.086515	3	0.0282

According to Table 7, the Hausman test produced a Prob. Cross-Section Random value of 0.02, which falls below the 0.05 significance level. This result leads to the rejection of the null hypothesis (H_0), suggesting that the Fixed Effect Model (FEM) is the most suitable model for this analysis. Given that both the Chow and Hausman tests indicate FEM as the appropriate model, conducting the Lagrange Multiplier test is unnecessary.

Panel Data Regression Analysis

The outcomes of the panel data analysis were obtained using the Fixed Effects Model (FEM) approach.

Table 8.
Fixed Effect Model (FEM) test results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C (Constant)	0.970343	1.210934	0.801318	0.4244
X1 (Firm size)	-0.023766	0.043334	-0.548448	0.5843
X2 (Firm age)	0.006536	0.002623	2.491441	0.0140
X3 (Leverage)	-0.019376	0.010387	-1.865429	0.0644
R squared				0.675240
Adj R-Squared				0.587127
F-Statistic				7.663317
Prob(F-statistic)				0.00000

Table 8 presents the panel data regression results, which analyze the impact of firm size, firm age, and leverage on the disclosure of intellectual capital among property and real estate firms listed on the Indonesia Stock Exchange for the period 2020–2024. The corresponding panel regression model is expressed as follows:

$$\text{Intellectual capital disclosure} = 0.970 - 0.024 \cdot X1 + 0.006 \cdot X2 - 0.019 \cdot X3 + \varepsilon$$

The panel data regression analysis shows that the intercept value of 0.970 represents the baseline level of Intellectual Capital Disclosure (Y) when the independent variables exert no influence. The coefficient for firm size (X1) is -0.024, indicating that an increase of one unit in firm size is associated with a decrease of 0.024 units in Y. Conversely, the firm age coefficient (X2) of 0.006 implies that each additional unit in firm age leads to an increase of 0.006 units in Y. Meanwhile, the leverage coefficient (X3) of -0.019 suggests that a one-unit rise in leverage corresponds to a reduction of 0.019 units in Y.

According to the data in Table 8, the adjusted coefficient of determination (Adjusted R^2) is 0.5871, meaning that approximately 58.71% of the variability in Intellectual Capital Disclosure (Y) is accounted for by firm size, firm age, and leverage. The remaining 41.29% of variation is attributable to other factors not included in this study, indicating that the model has a moderate capacity to explain changes in the dependent variable.

The simultaneous (F) test presented in Table 8 yields a Prob(F-statistic) of 0.00, which is below the 0.05 threshold, demonstrating that collectively, the independent variables significantly influence Intellectual Capital Disclosure among property and real estate companies listed on the Indonesia Stock Exchange from 2020 to 2024.

Furthermore, the partial (t) test results indicate that firm size (X1) has a p-value of 0.5843, and leverage (X3) has 0.06, both exceeding the 0.05 significance level, implying that individually they do not have a significant effect on Intellectual Capital Disclosure. In contrast, firm age (X2) has a p-value of 0.01, which is below 0.05, showing that it has a positive and statistically significant impact on Intellectual Capital Disclosure for the same companies during the observed period.

5. Discussion

The Influence of Firm Size on Intellectual Capital Disclosure

Based on the results presented in Table 8, the t-test significance value for firm size (X_1) is 0.58, which exceeds the 0.05 threshold. This finding indicates that firm size does not have a significant partial effect on Intellectual Capital Disclosure (ICD) among property and real estate companies listed on the Indonesia Stock Exchange during the 2020–2024 period. This result contradicts the initial hypothesis predicting a positive relationship between firm size and ICD but aligns with the findings of Mulyana and Daito (2021), who also reported no significant effect.

The lack of significance suggests that the magnitude of a company's assets or operational scale does not necessarily determine the extent of its intellectual capital reporting. In Indonesia, ICD practices remain largely voluntary, allowing both large and small firms to disclose information based on internal managerial policies rather than size-driven obligations (Fauziah & Murharsito, 2021; Sariningsih & Saputro, 2021). Furthermore, larger firms may already gain investor trust through mandatory financial reporting, reducing their incentive to disclose additional non-financial information (Hatane et al., 2018). These results indicate that firm size alone is not a sufficient determinant of ICD, emphasizing that disclosure behavior is more likely influenced by internal governance quality, managerial awareness, and organizational culture rather than firm scale (Elly Tulung et al., 2018; Widiatmoko et al., 2020).

The Influence of Firm Age on Intellectual Capital Disclosure

Referring to Table 8, the t-test results for firm age (X_2) show a significance value of 0.01, which is below the 0.05 threshold, with a positive coefficient of 0.00. This result indicates that firm age exerts a positive and statistically significant influence on

Intellectual Capital Disclosure among property and real estate companies listed on the Indonesia Stock Exchange during the 2020–2024 period. The finding supports the proposed hypothesis and is consistent with the studies of Novrian et al. (2020) and Anggraeni (2021), which demonstrated that older firms tend to disclose more intellectual capital due to their experience and established credibility.

Older firms generally possess more mature information systems, structured corporate governance, and established stakeholder relationships, all of which facilitate higher-quality disclosures (Kurniawati et al., 2020; Inayah & Difa, 2024). Moreover, mature companies are typically subject to greater scrutiny from regulators and investors, motivating them to enhance transparency and accountability (Anna & Dwi RT, 2018). This result supports the perspective of stakeholder theory, suggesting that firms with longer operational histories are more responsive to stakeholder demands and more likely to disclose intellectual capital to maintain trust and reputation in the market (Rambe et al., 2020; Wahyuningtyas et al., 2018).

The Influence of Leverage on Intellectual Capital Disclosure

Based on Table 8, the t-test significance value for leverage (X_3) is 0.06, which exceeds the 0.05 threshold. This indicates that leverage does not have a significant partial effect on Intellectual Capital Disclosure within property and real estate companies listed on the Indonesia Stock Exchange from 2020 to 2024. This finding contradicts the initial hypothesis, which expected a positive relationship, yet it is consistent with the results of Inayah and Difa (2024) and Suzan and Nurhakim (2023), who also found that leverage had an insignificant impact on ICD.

The result implies that a company's level of debt does not necessarily influence its disclosure of intellectual capital, as ICD remains voluntary and is not mandated by financial reporting regulations (Dewi & Nahar, 2020; Mujiani et al., 2020). Highly leveraged firms may prioritize mandatory financial information over voluntary disclosures, given their focus on meeting short-term debt obligations and satisfying creditor requirements (Sariningsih & Saputro, 2021). This outcome further supports the notion that ICD decisions are influenced more by managerial discretion and organizational strategy than by financial leverage or capital structure (Rivandi & Septiano, 2021; Widiatmoko et al., 2020).

Overall, the results reinforce that while firm age significantly contributes to ICD, firm size and leverage do not show substantial effects, highlighting that internal experience, maturity, and stakeholder orientation play a more central role than scale or financing in determining the extent of intellectual capital disclosure.

6. Conclusions

Based on the data analysis, the study concludes that the dependent variable, Intellectual Capital Disclosure, has a mean of 0.40 with a standard deviation of 0.06, indicating homogeneity, while the independent variables show varying characteristics: firm size (mean 28.28, SD 2.36) and firm age (mean 19.42, SD 9.41)

are relatively homogeneous, whereas leverage (mean 0.88, SD 0.98) is heterogeneous. Simultaneous testing shows that firm size, firm age, and leverage collectively influence Intellectual Capital Disclosure in property and real estate sector companies listed on the Indonesia Stock Exchange during 2020–2024. Partially, firm age has a positive and significant effect, while firm size and leverage do not. The study suggests that future research should expand the scope by including additional variables such as profitability, liquidity, and ownership structure, extend the research period, and consider companies from other sectors to gain a more comprehensive understanding of factors affecting intellectual capital. Practically, for companies, firm age can serve as an important factor in developing and documenting intellectual capital through internal knowledge systems, employee training, and continuous innovation. For investors, firm age may be considered when evaluating intellectual capital disclosure, as older companies typically offer stability, market experience, and mature management, though it remains important to assess how such experience is leveraged to create innovation and manage intellectual resources for competitiveness.

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