

JURNAL ILMIAH MANAJEMEN BISNIS DAN INOVASI
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THE IMPACT OF INTANGIBLE ASSETS ON FIRM VALUE AND
PERFORMANCE: EVIDENCE FROM ASIA-PACIFIC INFORMATION
TECHNOLOGY COMPANIES 2013-2023 PERIOD

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ARTICLE INFO

Keywords: *intangible assets, firm value, Tobin's Q, Asia-Pacific, IT sector, R&D, goodwill.*

Kata Kunci: aset tak berwujud, nilai perusahaan, Tobin's Q, Asia-Pasifik, sektor TI, R&D, goodwill.

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Abstract. This study explores how intangible assets (IA) influence firm value and financial performance among publicly listed Information Technology (IT) companies in the Asia-Pacific region over the period 2013 to 2023. It focuses on three key components of IA which is identified intangible assets (IIA), goodwill (GW), and research and development (R&D) and uses panel data regression, specifically the Random Effects Model, to assess their impact on firm value (measured by Tobin's Q) and firm performance (measured by ROA and ROE). The analysis covers 306 companies, categorized into two groups: intangible-intensive (IIP) and non-intangible-intensive (non-IIP) firms, based on the proportion of intangible assets to total assets. The results shows that R&D spending is associated with lower Tobin's Q, it positively contributes to ROE, suggesting that although R&D may dampen short-term market valuation, it supports long-term profitability. On the other hand, identifiable intangibles are linked to lower ROE and show varied effects on Tobin's Q depending on a firm's IA intensity. Interestingly, firms with higher IA intensity do not consistently outperform their less intangible-intensive peers, challenging the idea that more IA always translates to higher value.

Abstrak. This study explores how intangible assets (IA) influence firm value and financial performance among publicly listed Information Technology (IT) companies in the Asia-Pacific region over the period 2013 to 2023. It focuses on three key components of IA which are identified intangible assets (IIA), goodwill (GW), and research and development (R&D) and uses panel data regression, specifically the Random Effects Model, to assess their impact on firm value (measured by Tobin's Q) and firm performance (measured by ROA and ROE). The analysis covers 306 companies, categorized into two groups: intangible-intensive (IIP) and non-intangible-intensive (non-IIP) firms, based on the proportion of intangible assets to total assets. The results show that R&D spending is associated with lower Tobin's Q, it positively contributes to ROE, suggesting that although R&D may dampen short-term market valuation, it supports long-term profitability. On the other hand, identifiable intangibles are linked to lower ROE and show varied effects on Tobin's Q depending on a firm's IA intensity. Interestingly, firms with higher IA intensity do not consistently outperform their less intangible-intensive peers, challenging the idea that more IA always translates to higher value.

INTRODUCTION

Intangible assets have emerged as key factors influencing business value and economic expansion in the modern economy. In today's economy, intangible assets have also emerged as the primary source of wealth creation, frequently surpassing the significance of tangible assets like real estate or machinery. Although they don't have a physical shape like real resources do, these assets which including software, patents, brands, and even reputation—drive innovation, long-term success, and consumer loyalty.

Research indicates that intangible assets now constitute a significant portion of firms' capital investments. For instance, another study said that intangibles play a crucial role in understanding macroeconomic trends, including productivity and investment patterns (Crouzet et al., 2022). However, the rise of intangible assets also poses challenges. Their value is often harder to measure and protect compared to physical assets. Additionally, intangible assets require legal safeguards like patents and trademarks to prevent theft or imitation. The other study also highlights the growing significance of intangible assets in the modern economy by examining their development and effects on economic performance. Numerous quantitative assessments of the influence that intangible assets have on economic performance emphasize the significance of intangible assets. (Bavdaž et al., 2022). The 21st-century economy has witnessed a paradigm shift from physical, tangible assets (e.g., machinery, buildings) to intangible assets (e.g., patents, software, brand equity, R&D) as the primary drivers of corporate value and economic growth. This transition reflects the rise of the knowledge economy, where innovation, intellectual property, and human capital dominate competitive advantage (Corrado et al., 2009).

Intangible assets are increasingly critical to firm valuation. Traditional accounting frameworks often undervalue intangibles due to their non-physical nature, but investors recognize their role in generating future cash flows. (Lev & Gu, 2016) demonstrated that firms with higher intangible intensity (e.g., R&D, brand value) exhibit significantly higher Tobin's Q ratios, reflecting investor expectations of long-term growth. Intangible assets are central to innovation ecosystems. R&D investments, patents, and proprietary technologies enable firms to differentiate themselves in competitive markets. There's also a study that the author emphasized R&D and software investments yield higher productivity gains than tangible assets in the long run (*Market Value and Patent Citations on JSTOR*, n.d.). The rise of digital technologies such as AI, blockchain, cloud computing) and globalization have amplified the importance of intangibles. Digital platforms, data analytics, and customer relationships are intangible assets that drive modern business models. Despite all the importance that mentioned previously, there's also intangibles remain underreported in financial statements due to accounting standards, most intangibles like the example internally generated brands and employee skills are expensed rather than capitalized . There's also a challenges such as valuation complexity, unlike tangible assets, intangibles lack observable market prices, leading to reliance on subjective estimation.

Over the past three decades, the global economy has experienced a significant transition, with intangible assets becoming the main drivers of company value and performance and traditional tangible assets like buildings, machinery, and inventory becoming less relevant. This change is indicative of the emergence of the knowledge economy, where competitive advantage is increasingly determined by innovation, intellectual property, and human capital..

Investments in intangible assets are positively correlated with greater market valuations, according to a 2009–2018 study that examined 250 publicly traded companies in France, Germany, and Switzerland. This demonstrates how the market recognizes the value of intangible assets (Dancaková et al., 2022). However, because of their intrinsic qualities, intangible asset appraisal is difficult. Since intangible assets don't have actual substance like tangible assets do, measuring and reporting them can be challenging. Because companies are frequently exempt from reporting distinct measurements for intangibles under current accounting standards, financial statements may be undervalued (Jarrett, n.d.).

The presence of intangible assets is also linked to improved financial performance metrics. Research focusing on technology firms globally indicates that intangible assets have a direct positive impact on market value and financial policies. The study suggests that higher investments in intangibles lead to better financial outcomes, including profitability and market valuation (Qureshi & Siddiqui, 2021). Furthermore, long-term value development and sustained expansion are facilitated by intangible assets. Investments in intellectual capital have a beneficial impact on firm value and sustained growth rates, according to an analysis of businesses listed on the Bucharest Stock Exchange. This research emphasizes how crucial intangibles are strategically to attaining long-term financial success (Ionita & Dinu, 2021).

Even with plenty of research on intangible assets and how they affect business value and performance, there are still a number of gaps in the body of knowledge. However, prior studies have demonstrated a favorable correlation between corporation valuation and intangible assets. Intara and Suwansin (2024a) conducted a study that was limited to Thai listed firms on the Stock Exchange of Thailand (SET). The impact of intangible assets on business value and performance in emerging economies, especially in the Asia-Pacific area, is, nevertheless, not well supported by empirical data. The reason that we write about IT companies in Asia Pacific because this sector heavily relies on intangible assets such as R&D, software, and intellectual capital to create value. In the midst of a global shift toward a knowledge-based economy, it is important to understand how intangible assets affect firm value and performance, especially in the Asia-Pacific region, which has shown significant growth but remains underexplored in this context. This study intends to fill these gaps by offering a thorough examination of the ways in which intangible assets and their constituent parts affect firm value and performance in listed Asia-Pacific businesses.

LITERATURE REVIEW

Resource Based View

A strategic management paradigm known as the Resource-Based View (RBV) places a strong emphasis on a company's internal resources as the main factors influencing its performance and competitive advantage. With this viewpoint, internal resource analysis replaced external market positioning. According to RBV, businesses are diverse organizations with distinct sets of skills and resources. When these resources are rare, valuable, unique, and non-replaceable (VRIN), they can provide a long-term competitive edge. The framework divides resources into two categories: intellectual assets like patents, brand reputation, and organizational culture, and tangible assets like capital and machinery. When these resources are deployed and combined effectively, businesses can adopt methods that are difficult for rivals to imitate. The RBV has significantly influenced strategic management research and practice. It underscores the importance of identifying, developing, and protecting unique resources to achieve long-term success. (Wernerfelt, 1984). However, the theory has faced critiques regarding its applicability and the challenges in resource measurement. Despite these critiques, the RBV remains a foundational concept in understanding how internal firm characteristics contribute to competitive positioning and performance.

VRIN Framework

The Resource-Based View (RBV) emphasizes that a firm's sustained competitive advantage depends on its ability to possess and utilize resources that exhibit value, rarity, inimitability, and non-substitutability (VRIN). A resource is considered valuable if it enhances a firm's efficiency or effectiveness, allowing it to respond to market opportunities and threats more effectively. Rare resources are those not widely held by competitors, giving the firm a unique position in the industry. Inimitability refers to the difficulty competitors face in replicating or acquiring the resource due to factors such as historical conditions, causal ambiguity, or social complexity. Lastly, non-substitutability implies that no alternative resources can replace the competitive advantage offered by the resource, ensuring its strategic importance remains intact. When firms possess resources that fulfill these criteria, they can achieve a sustained competitive advantage, allowing them to outperform competitors in the long run. Empirical research supports the VRIN framework, demonstrating that firms with intangible assets such as brand reputation, intellectual property, and unique organizational culture can sustain superior financial performance (Barney, 2000). The RBV framework remains a cornerstone in strategic management, guiding firms to develop internal capabilities that are difficult for competitors to replicate.

Knowledge Based View

The Knowledge-Based View (KBV) is an extension of the Resource-Based View (RBV) that emphasizes knowledge as the most critical resource for sustaining competitive advantage. KBV argues that firms exist primarily to create, integrate, and apply knowledge efficiently. Unlike physical assets, knowledge is difficult to imitate, making it a key driver of firm performance and long-term value creation (Grant, 1996). Firms leverage both explicit knowledge (codified in documents, patents, and databases) and tacit knowledge (embedded in

employees' skills, experiences, and organizational culture). The ability to manage and transfer knowledge effectively determines a firm's innovative capacity and competitive positioning. Strategic investments in R&D, knowledge-sharing systems, and learning capabilities enhance a firm's ability to create differentiated products and adapt to market changes. KBV also highlights the role of dynamic capabilities in sustaining competitive advantage. Firms that continuously update and reconfigure their knowledge base are better positioned to respond to technological shifts and industry disruptions (Teece et al., 1997). Given the growing importance of intellectual capital, KBV is particularly relevant in knowledge-intensive industries such as technology, pharmaceuticals, and finance.

Intangible Assets (IA)

Firms invest heavily in intangible assets through R&D, employee training, and strategic alliances to enhance their market position and financial performance. Research suggests that firms with a higher proportion of intangible assets tend to have higher market valuations, innovation capacity, and long-term profitability (Hall, 1993). However, intangible assets are often difficult to measure and value due to their non-physical nature and lack of standardized accounting treatment.

Identifiable intangible assets (IIA)

Identifiable intangible assets (IIA) are non-physical assets that can be separately recognized, owned, and transferred by a firm. These assets provide economic benefits and are often legally protected, making them more measurable than unidentifiable intangible assets such as goodwill or brand reputation (Lev, 2001). Identifiable intangible assets include patents, trademarks, copyrights, and customer databases—assets that can be legally separated from the company. Unidentifiable intangible assets, such as goodwill and brand equity, arise from a firm's overall reputation and relationships (Corrado et al., 2005). From an accounting perspective, IIAs must meet certain criteria to be recognized in financial statements. They must be separately identifiable, measurable, and expected to generate future economic benefits (*IFRS - IAS 38 Intangible Assets*, n.d.). Unlike goodwill, which arises from business combinations and cannot be separated, identifiable intangible assets can be bought, sold, or licensed, contributing to a firm's financial value. Studies indicate that firms with strong IIAs tend to have higher market valuations and better innovation performance due to their ability to monetize intellectual property and proprietary knowledge (Hall, 1993).

Goodwill (GW)

When a business buys out another company for more than the net worth of its assets, it creates goodwill, an intangible asset that cannot be identified. It stands for the excess amount spent on intangible assets like customer loyalty, brand reputation, staff knowledge, and acquisition synergies (Lev, 2001). Unlike identifiable intangible assets (such as patents or trademarks), goodwill cannot be separately sold or transferred and is only recorded when an acquisition occurs (IASB, 2021). Economically and strategically, firms with high goodwill often enjoy long-term competitive advantages. However, goodwill also presents risks, as overpaying for acquisitions can result in significant losses if expected synergies fail to materialize (Damodaran, 2012). Thus, while goodwill is a valuable asset, its proper assessment and management are crucial to sustaining a firm's financial health and competitive position.

Research and Development

Research and Development (R&D) refers to the systematic process through which firms and institutions create new knowledge, products, services, and processes, or improve existing ones. It plays a critical role in fostering innovation, enhancing productivity, and maintaining a competitive advantage in various industries, particularly in technology-intensive sectors (Griliches, 1998). R&D activities are typically categorized into basic research, applied research, and experimental development. Basic research aims to expand scientific knowledge without immediate commercial applications, while applied research focuses on solving practical problems. Experimental development involves the application of existing knowledge to create new or improved products and services (OECD, 2015). Firms invest in R&D to develop patents, proprietary technology, and product differentiation, which contribute to long-term value creation. R&D intensity, measured as R&D expenditure relative to revenue, is a key indicator of a firm's commitment to innovation (Hall, 1993). Studies indicate that firms with higher R&D spending tend to achieve higher market valuations, increased productivity, and stronger financial performance (Lev & Sougiannis, 1996). However, R&D investments are also associated with risks due to uncertain outcomes, high costs, and long development cycles. Successful R&D strategies require continuous funding, knowledge integration, and intellectual property protection to maximize returns on innovation (Teece et al., 1997).

Firm Value and Firm Performance

Firm value is a fundamental concept in corporate finance that reflects a company's overall financial health, operational efficiency, and ability to generate wealth for its stakeholders. It is a critical measure for investors, managers, and policymakers as it serves as an indicator of a firm's success and sustainability in the long run (Brigham & Houston, 2019). Firm value encompasses both tangible and intangible factors, incorporating elements such as financial performance, market perception, and strategic positioning in the industry. The concept of firm value is closely linked to value creation, which is achieved through improved company performance and effective resource utilization. Value creation occurs when firms generate returns that exceed their cost of capital, leading to increased investor confidence and higher stock prices (Brigham & Houston, 2019). Investors view firm value as a crucial factor when making investment decisions, as it reflects not only past financial performance but also the company's growth potential and risk exposure. A firm with a high value is perceived as financially stable, competitive, and capable of generating sustainable profits, which ultimately benefits shareholders and other stakeholders.

One of the most widely used indicators of firm value is Tobin's Q, a performance metric introduced by James Tobin in 1970. Tobin's Q is defined as the ratio of a firm's market value to the replacement cost of its assets. It is calculated using the following formula:

$$\text{Tobin's Q} = \frac{\text{Market Value of Equity} + \text{Market Value of Debt}}{\text{Replacement Cost of Assets}}$$

A Tobin's Q value greater than 1 indicates that a firm's market value exceeds the cost of replacing its assets, suggesting that the firm is efficiently utilizing its resources and has strong growth potential. Conversely, a Tobin's Q value lower than 1 implies that the firm is

undervalued, possibly due to inefficiencies in resource allocation, weak financial performance, or unfavorable market conditions (Intara & Suwansin, 2024b) .

Several factors influence firm value, encompassing both internal and external elements. Financial performance indicators, such as return on assets (ROA) and return on equity (ROE), play a pivotal role; firms exhibiting high profitability and efficient asset utilization tend to experience increased market valuation and investor trust. This study evaluates a company's financial performance by applying profitability indicators, specifically Return on Assets (ROA) and Return on Equity (ROE). Both ratios are widely recognized as key measures of operational effectiveness and profitability. ROE demonstrates how well a firm generates earnings relative to the equity provided by shareholders, while ROA indicates how efficiently the firm utilizes its total assets to produce net income. Using both metrics provides a broader and more accurate picture of the company's financial health and operational performance (Intara & Suwansin, 2024). ROA and ROE are financial ratios reflecting overall operating performance, indicating profitability”, and together they “provide a more comprehensive assessment” of firm performance.

Corporate governance practices also significantly impact firm value. Effective mechanisms, including the presence of independent commissioners and managerial ownership, have been shown to enhance firm value by mitigating earnings management and aligning management's interests with those of shareholders (Subanidja et al., 2016). Additionally, macroeconomic indicators, such as gross domestic product (GDP) growth, can influence firm value, although firm-specific factors like asset tangibility and profitability are often more critical determinants (Febrianti et al., 2024). Firm value serves as a comprehensive measure of a company's financial strength, operational efficiency, and market position. It is determined by a combination of financial indicators, investor perceptions, corporate governance practices, and external economic factors. The use of Tobin's Q, along with other valuation metrics, provides a robust framework for assessing firm value and guiding investment decisions. Given its importance in corporate finance and strategic management, firm value remains a central topic in academic research, with ongoing studies exploring its determinants, implications, and measurement approaches in various economic contexts.

Intangible-Intensive Firms

Intangible-intensive firms are organizations that prioritize substantial investment in intangible assets, such as intellectual property, brand reputation, employee expertise, and organizational culture. These assets, while not physically tangible, are critical drivers of a firm's competitive advantage and long-term success. There's a study that conducted by (Shakina & Barajas, 2015) which categorized company strategic profiles based on their emphasis on intangible resources. They identified three distinct profiles, which is innovative, conservative and moderate. The innovative profile is characterized by significant investment in innovation and networking capabilities, reflecting a proactive approach to market changes and technological advancements. Companies with this profile focus on research and development, fostering collaborations, and continuously seeking new opportunities to innovate. The conservative profile, on the other hand, emphasizes managerial capabilities and the development of business processes. Firms adopting this approach concentrate on enhancing

internal efficiencies, refining management practices, and optimizing existing operations. The moderate profile represents companies that allocate resources evenly among various intangible assets but at lower levels compared to the other two profiles. These firms maintain a balanced approach without a pronounced focus on any specific intangible asset. Previous research by (Shakina & Barajas, 2016), their findings suggest that companies with a conservative intangible-intensive profile were better protected during economic downturns, likely due to their focus on internal efficiencies and robust management practices. However, firms with an innovative profile demonstrated a faster recovery post-crisis, attributed to their agility and capacity to adapt to new market conditions through innovation (Shakina & Barajas, 2016). The strategic orientation towards intangible assets significantly influences a firm's performance and resilience. Companies that effectively manage and invest in intangibles are better positioned to navigate economic fluctuations and sustain long-term growth. Therefore, understanding and adopting an appropriate intangible-intensive strategy is crucial for firms aiming to enhance their competitiveness and value creation in today's knowledge-based economy.

Hypothesis Development

Relationship between Intangible Assets and Firm Value & Performance

Intangible assets, encompassing elements like intellectual property, brand reputation, and proprietary technologies, have been identified as significant contributors to a firm's value and performance. A study focusing on Malaysian companies found that intangible assets positively impact firm performance metrics such as return on assets and return on equity (Haji & Ghazali, 2018). Similarly, research on Korean SMEs highlighted that investments in intangible assets, including human capital and R&D, are essential for achieving superior firm performance (Seo & Kim, 2020). Their study, which examined 173 manufacturing SMEs in Korea from 2011 to 2016, revealed that intangible investments in specifically in human capital, R&D, and advertising which are all positively associated with both profitability and firm value. Among the three, advertising intensity exhibited the strongest influence, contributing significantly to gross profit margins and firm valuation. Human capital investment, measured through training expenditure, also showed a meaningful positive effect on profitability, emphasizing the role of employee development in enhancing operational outcomes. R&D spending, while having a comparatively smaller effect on profitability, demonstrated a consistent positive association with firm value, reflecting its long-term strategic contribution. These findings underscore that even in resource-constrained environments like SMEs, intangible assets can be powerful drivers of financial performance. Importantly, the study affirms that not all intangibles contribute equally; rather, their impact varies depending on the performance metric and investment type. This supports the broader notion that targeted and well-managed intangible investments are critical for sustaining competitive advantage and improving financial outcomes.

H1: Intangible assets are positively associated with firm value and performance.

Relationship between Identifiable Intangible Assets (IIA) and Firm Value & Performance

Identifiable intangible assets, such as patents and trademarks, have been shown to enhance a firm's market valuation and operational success. Empirical evidence suggests that firms with greater identifiable intangible assets tend to have better firm value, as measured by metrics like Tobin's Q (Intara & Suwansin, 2024b). Their study, which examined Thai-listed firms over a ten-year period, found that IIA had a statistically significant positive impact on firm value but not on firm performance indicators like ROA and ROE when viewed across all firms. However, when firms were stratified by their level of intangible asset intensity, the results became more nuanced. For firms with a high intangible-intensive profile (IIP), IIA significantly improved not only Tobin's Q but also ROA and ROE. In contrast, non-IIP firms showed no significant performance gains from IIA. This suggests that the effectiveness of IIA in driving firm value and performance is contingent upon the firm's broader strategic emphasis on intangible asset investment. In IIP firms, where IA are more actively managed and integrated into business operations, IIA like trademarks, brand names, and proprietary technologies appear to deliver more substantial returns in both valuation and profitability metrics.

H1A: Identifiable intangible assets (IIA) are positively associated with firm value and performance.

Relationship between Goodwill (GW) and Firm Value and Performance

Goodwill, arising from business acquisitions, reflects the excess of purchase price over the fair value of identifiable net assets. Studies have demonstrated that goodwill positively impacts firm value and performance. For instance, research indicates that goodwill has a significant positive effect on firm value (Tobin's Q) and financial performance metrics such as return on assets and return on equity (Intara & Suwansin, 2024b). In their empirical analysis of 390 listed firms in Thailand over a ten-year period, (Intara & Suwansin, 2024b) found that goodwill significantly increases Tobin's Q with a positive coefficient, suggesting that investors perceive goodwill as a valuable resource linked to long-term strategic advantages such as customer loyalty, reputation, or management excellence.

Moreover, the study showed that goodwill has a substantial and statistically significant positive impact on both ROA and ROE, indicating that it contributes meaningfully to a firm's operational and financial efficiency. Interestingly, when the sample was divided into intangible-intensive (IIP) and non-intangible-intensive (non-IIP) firms, the positive effects of goodwill were evident across both groups, but more pronounced in IIP firms. For example, the ROA and ROE coefficients for IIP firms were 35.047 and 58.799 respectively, compared to 12.301 and 16.535 for non-IIP firms. This suggests that firms that strategically manage and integrate intangible assets into their core operations are better positioned to convert goodwill into tangible financial benefits.

These findings highlight goodwill as more than just an accounting "things" from acquisitions; it represents an embedded value that, when supported by an intangible-focused corporate strategy, can drive firm growth, profitability, and shareholder value. Therefore, the

positive association between goodwill and firm value and performance, as supported by both empirical evidence and resource-based theory provides strong support for hypothesis H1B.

H1B: Goodwill (GW) is positively associated with firm value and performance.

Relationship between Research and Development (R&D) and Firm Value and Performance

Investment in R&D is crucial for innovation and long-term competitiveness. Empirical studies have consistently shown that R&D expenditures are positively associated with firm value and performance. For example, a study on Indonesian firms found that intellectual capital, which includes R&D activities, positively influences both financial performance and market value (Silviani & Noekent, 2020). Although R&D is not directly isolated in their analysis, the strong positive relationship between intellectual capital and firm outcomes demonstrated by a path coefficient of 0.406 for financial performance and 0.413 for market value, this mean that intangible investments like R&D contribute significantly to firm success.

For supporting this, other studies that treat R&D as a main component also have found even more direct and substantial effects. For instance, (Intara & Suwansin, 2024b) reported that R&D expenditures had a highly significant and positive impact on Tobin's Q (25.705), ROA (58.670), and ROE (89.582), indicating both market and operational advantages derived from innovation-focused investments. These results suggest that firms with stronger commitments to R&D enjoy superior valuation and profitability. Similarly, a study on Indonesian palm oil firms by (Hutauruk, 2024) confirmed that R&D investment significantly enhances firm value, underscoring its relevance even in traditional sectors. Moreover, research by (Rahman & Howlader, 2022) in the South Asian context demonstrated that lagged R&D spending positively affects ROA, ROE, and Tobin's Q, highlighting its longer-term financial benefits.

These findings reinforce the notion that R&D is not merely a cost but a strategic asset that drives innovation, creates competitive differentiation, and enhances shareholder value. The consistent and statistically significant effects of R&D across various industries and markets underscore its role as a key intangible that supports hypothesis.

H1C: Research and development (R&D) is positively associated with firm value and performance.

Role of Intangible-Intensive Profile (IIP) on the Impact of Intangible Assets on Firm Value and Firm Performance

H2: Intangible-Intensive Profiles (IIP) enhance the positive impact of intangible assets on firm value and performance.

Firms classified as intangible-intensive profile (IIP) firms allocate a significant portion of their resources to intangible assets (IA), such as research and development (R&D), patents, and brand equity. These firms, particularly in technology (more likely software company), pharmaceuticals, and high-value manufacturing industries, rely on intangibles to drive innovation and maintain competitive advantages. In contrast, non-IIP firms (e.g., traditional

service or resource-based industries) tend to invest less in intangibles and more in physical capital (Montresor & Vezzani, 2016). The Knowledge-Based View (KBV) and Resource-Based View (RBV) theories suggest that firms leveraging IA more efficiently can achieve superior firm value and performance (Teece, 2018). Research also indicates that intangible-intensive firms generally experience higher market valuations, reflected in metrics such as Tobin's Q, return on assets (ROA), and return on equity (ROE).

IIP firms tend to extract higher value from IA investments due to stronger capabilities in knowledge management, innovation processes, and brand positioning (Shakina & Barajas, 2013). Empirical findings suggest that the market rewards firms with strong IA portfolios, as investors perceive them to have greater growth potential and innovation capacity (Brown et al., 2012). This translates into a higher Tobin's Q and better financial performance compared to non-IIP firms.

H2A: The positive effects of identifiable intangible assets (IIA) on firm value and performance are higher for IIP firms than for non-IIP firms.

Identifiable intangible assets (IIA), such as patents, trademarks, and customer relationships, contribute to firm value by enhancing brand reputation, customer loyalty, and product differentiation. These assets are particularly valuable for technology-driven and consumer-focused firms, where branding and proprietary knowledge create competitive advantages (Montresor & Vezzani, 2016).

For IIP firms, IIA investments are more likely to generate sustained competitive advantages, as these firms actively manage and exploit their intangible assets (Shakina & Barajas, 2013). Studies suggest that IIP firms experience higher returns on IIA investments due to better integration into business strategy and superior knowledge management practices (Teece, 2018). Empirical evidence indicates that firms with high IIA intensity achieve higher ROA and ROE than their industry peers, reflecting their superior ability to monetize intangible assets.

H2B: The positive impact of goodwill (GW) on firm value and performance is higher for IIP firms than for non-IIP firms.

Goodwill (GW) arises primarily from mergers, acquisitions, and brand equity, reflecting the premium paid for firms with strong intellectual capital, customer relationships, and market positioning (Chalmers et al., 2011). For IIP firms, goodwill often represents acquired intangible capabilities, such as patented technologies or strong brand reputations, that enhance long-term value creation (Zwaferink, n.d.). Studies show that firms with high goodwill levels tend to outperform their peers in high-growth and knowledge-intensive industries, where intellectual assets drive market success (Brown et al., 2012).

However, the impact of goodwill is highly industry-dependent. In industries where brand recognition and customer trust are crucial (e.g., luxury goods, pharmaceuticals), goodwill contributes significantly to firm performance (Montresor & Vezzani, 2016). In

contrast, in non-IIP sectors, goodwill may have a weaker or even negligible effect (Chalmers et al., 2011).

H2C: The positive impact of research and development (R&D) on firm value and performance is higher for IIP firms than for non-IIP firms.

R&D investment is a key driver of firm innovation, particularly in technology-intensive industries, where continuous development is necessary to sustain market leadership (Dai & Chapman, 2022). IIP firms are more likely to benefit from R&D expenditures due to their superior ability to integrate innovation into business models, leading to higher market valuations and profitability (Shakina & Barajas, 2013). Empirical studies highlight that R&D-intensive firms experience higher Tobin's Q, better ROA, and increased investor confidence (Zwaferink, n.d.). (Brown et al., 2012) found that firms with strong R&D portfolios outperform competitors in terms of long-term growth and market capitalization. However, the effectiveness of R&D spending varies across industries. Manufacturing and high-tech firms see significant performance gains, whereas service-based firms may not experience the same level of benefits (Montresor & Vezzani, 2016).

RESEARCH METHODOLOGY

Research Design

This study is using quantitative research design. The study is using secondary data sources obtained from S&P Capital IQ and company's annual report. The dataset consists of listed firms in the informational and technology sector across public-listed company in the Asia-Pacific region. The research is using Ordinary Least Squares (OLS) regression analysis as the primary econometric tool to test hypothesis, measure correlations and asses the statistical significance of intangible assets in determining firm value and performance.

Data

The population of this study is using public listed companies in information and technology sector in the S&P Capital IQ. We use information technology sector since in measuring the "intangible assets" of one companies, these sectors have the most rich intangible assets comparing with other sectors. As the information from S&P Capital IQ also the companies other than information and technology sector have a lack of data to do a research. The sample selection is shown in Table 1. The study is assessed the listed company from 2013-2023 for ten years. The total population is 4,625 companies and reduce into 337 companies because of the incompleteness of the data. These 306 companies is from Japan, Taiwan, China, Hongkong, South Korea, Australia, Malaysia, Singapore, Philippines and India.

Table 3.1 Sample Selection Procedure

Sample Selection Procedure	Number of Companies
Starting number of firms	4,625
Companies with a data of identified intangible assets	2,062
Companies with a data of goodwill	460
Companies with a data of R&D	1,743
Number of final firm-year observations (companies that have a data of IIA, goodwill and R&D expenses)	306

Other supporting data besides the secondary data in the S&P Capital IQ which includes annual reports and financial information, there's other data such as journals as collected, books, literature, white papers and other media.

Research Variables and Operational Definitions

The variables used in this research are classified into dependent, independent and control variables, with firm value and firm performance as the key dependent variables, identified-intangible assets (IIA), goodwill and R&D expenses as the key of independent variables and firm size, leverage, institution holding, and duality as the key of control variables.

Dependent Variables

Firm Value (Tobin's Q)

Firm value is representing the total present value of all income or benefits expected to be generated over the lifespan of a company. It comprises both actual and potential benefits that a firm can provide. In this study, firm value is measured using Tobin's Q, a widely accepted metric that evaluates a firm's market valuation relative to its asset replacement cost.

$$(1) \text{ Tobin's } Q = \frac{\text{Market Capitalization} + \text{Preferred Stock} + \text{Net Debt}}{\text{Book Value of Total Assets}}$$

Definitions of each variables is explained below:

- Market Capitalization is the current market value of equity, computed by multiplying the stock's current price by the total number of outstanding shares.
- Preferred Stock Value is representing the market value of outstanding preferred shares.
- Net Debt is the difference between the book value of current liabilities and current assets, including the book value of long-term debt.
- Book Value of Total Assets is representing the accounting value of all assets owned by the firm.

If Tobin's Q is greater than one, it means the company is valued higher than the cost of replacing its assets, which could indicate that investors have high expectations for its future growth. On the other hand, if Tobin's Q is between zero and one, it suggests that the company is undervalued because its market value is lower than the cost of replacing its assets. To make

the data easier to analyze and reduce any extreme variations, this study uses the natural algorithm of Tobin's Q as the measure of firm value.

Firm Performance (Return on Assets and Return on Equity)

Firm performance is assessed using profitability ratios, which is return on assets (ROA) and return on equity (ROE). These financial ratios are widely recognized as indicators of a firm's operational efficiency and profitability.

Definitions of each variables is explained below:

- ROA (Return on Assets) measures how efficiently a company utilizes its assets to generate profit, providing insight into asset productivity. The formula is on the below:

$$(2) \text{ Return on Asset} = \frac{\text{Net Income}}{\text{Total Assets}}$$

- ROE (Return on Equity) measures the company's ability to generate income from shareholders' equity, indicating how effectively shareholder investments are utilized.

$$(3) \text{ Return on Equity} = \frac{\text{Net Income}}{\text{Total Equity}}$$

These ROA and ROE is crucial for assessing financial performance and company effectiveness. By combining with these both measures, it will provide a comprehensive evaluation of firm performance by offering insights into both asset efficiency and shareholder returns.

Independent Variables

In the intangible assets, this one will be classify the into identifiable intangible assets (IIA) and unidentifiable intangible assets (non-IIA). Identifiable intangible assets (IIA) include copyrights, trademarks and patents, which can be separated from other assets and provide valuable insights into a firm's future profitability. On the other hand, unidentifiable intangible assets like goodwill cannot be separated from the company. Companies with substantial goodwill may experience an increase in firm value, potentially influencing investor decisions. According the study from (Zhang, 2017), (Mohanlingam and Nguyen, 2021), (Vanderpal, 2019), it will utilize the total sum of intangible assets as a key measure. Besides treating the intangible assets as a single entity, this study will distinguish between three sub-components:

- Identifiable Intangible Assets (IIA) is including legally recognized assets such as patents, trademarks and copyrights that are expected to contribute to future economic benefits.
- Goodwill (GW) is representing the excess amount paid during acquisitions beyond the fair market value of net assets, reflecting the company's reputation, customer relationships and brand equity.
- Research and Development (R&D) is company's investment in innovation and technological advancements that contribute to a firm's long-term growth and competitive advantages.

After separating all of these three components, the study will aim to provide more detailed understanding on how different types of intangible assets influence firm value and performance.

Intangible-Intensive Profile (IIP)

To test whether the firm with a high proportion of intangible assets has a stronger impact on firm value and performance (H2), the study is also adopting an intangible-intensive profile (IIP) measure. The IIP is determined by the proportion of intangible assets to total assets.

$$(4) \text{ Intangible-Intensive Profile} = \frac{\text{intangible assets}}{\text{total assets}}$$

Firms with values greater than or equal to the median of all observations are categorized as intangible intensive profiles (IIP), while those below the median are categorized as non-intangible-intensive profiles (non-IIP).

Control Variables

In testing the relationship between intangible assets and firm performance, it is essential to account for various control variables that may influence this hypothesis dynamic. This study incorporates two primary categories of control variables which including firm characteristics (Sisodia et al., 2021), (Tahat et al., 2018) and governance-specific factors.

Firm Size

The firm size (SIZE) is a key financial metric used to assess a company's scale, calculated as the natural logarithm of its total assets. Taking the logarithm helps normalize the data, reducing skewness from extreme values and improving statistical analysis. Larger firms (higher SIZE) often benefit from economies of scale, stronger market influence, and better access to financing, while smaller firms may be more agile. This measure is widely used in corporate finance, risk assessment, and performance comparisons across industries. By using the natural logarithm, researchers can linearize relationships in regression models, ensuring more reliable and interpretable results in financial and economic studies.

Leverage

Leverage is categorized as a firm characteristics. Leverage is indicating the extent to which a firm utilize or making benefits from borrowed funds in its capital structures. The degree of leverage can significantly influence a firm's risk profile and financial flexibility. High leverage may enhance returns during favorable conditions but can also increase the risk of financial distress. According to (Rajan et al., 1995) and (Frank et al., 2009), Firms with higher leverage may experience reduced firm value due to the increased of its financial risk. But also, the positive effects for leverage is, (Fama & French, 2000) highlighted that higher leverage can enhance returns during favorable economic conditions, as firms can finance growth with lower-cost debt, benefiting from tax shields on interest payments. The leverage ratio is commonly calculated by debt-to-assets ratio and debt-to-equity ratio:

$$(5) \text{ Debt to Assets} = \frac{\text{Total Debt}}{\text{Total Assets}}$$

$$(6) \text{ Debt to Equity} = \frac{\text{Total Debt}}{\text{Total Equity}}$$

The debt-to-assets ratio is measured by the proportion of a company's assets that are financed by debt. If the value is higher means the company is relies more on debt financing. It also can be used to assess the financial risk and capital structure stability. The debt-to-equity ratio is measures the proportion of debt financing relative to its shareholders' equity. If

a value is higher means the firm uses more debt compared to equity, this increase the financial leverage and helps investors understand the level of financial risk.

Board Independence

Board independence is categorized as governance-specific factors. Board independence refers to the proportion of non-executive or independent directors on a company's board, calculated as the ratio of independent directors to the total number of directors. Independent directors are expected to provide unbiased oversight and mitigate agency problems between management and shareholders. A higher proportion of independent directors has been associated with improved monitoring and reduced earnings management (Abdelkarim & Zuriqi, 2020).

Institutional Ownership

Institutional ownership is categorized as governance-specific factors. Institutional ownership denotes the percentage of a company's shares held by institutional investors, such as mutual funds, pension funds and insurance companies. Institutional investors often possess significant resources and expertise, enabling them to monitor management effectively. Their substantial shareholdings can influence corporate decisions and potentially enhance firm performance. Studies have indicated that higher institutional ownership is positively correlated with firm value, as these investors can exert considerable influence on corporate governance practices (Abdelkarim & Zuriqi, 2020). The institutional ownership calculation is shown below:

$$(7) \text{ Institutional Ownership} = \frac{\text{Number of Shares Held by Institutional Investors}}{\text{Total Number of Shares}}$$

CEO Duality

CEO Duality is categorized as governance-specific factors. CEO duality occurs when the Chief Executive Officer also serves as the Chairperson of the Board of Directors. This variable is typically coded as binary indicator, equal to one if the CEO and Chairperson roles are combined and zero otherwise (Elgiziry, 2015). The consolidation of these roles can lead to a concentration of power, potentially diminishing the board's ability to oversee management objectively. Research findings on the impact of CEO duality are mixed. Some studies suggest it can enhance decision-making efficiency but some studies indicate it may impact on firm performance due to reduced oversight (Kijkasiwat et al., 2022).

Empirical Model

The empirical model for this study is shown by below:

Firm Value's Empirical Model:

$$(8) \text{ Tobin's } Q = \beta_0 + \beta_1 \text{ IA}_{i,t} + \beta_2 \text{ LEV}_{i,t} + \beta_3 \text{ SIZE}_{i,t} + \beta_4 \text{ InsHold}_{i,t} \\ + \beta_5 \text{ Indep}_{i,t} + \beta_6 \text{ DUAL}_{i,t} + \varepsilon_{it}$$

Firm Performance's Empirical Model:

$$(9) \text{ ROA}_{i,t} = \beta_0 + \beta_1 \text{ IA}_{i,t} + \beta_2 \text{ LEV}_{i,t} + \beta_3 \text{ SIZE}_{i,t} + \beta_4 \text{ InsHold}_{i,t} \\ + \beta_5 \text{ Indep}_{i,t} + \beta_6 \text{ DUAL}_{i,t} + \varepsilon_{it}$$

$$(10) \text{ ROE}_{i,t} = \beta_0 + \beta_1 \text{ IA}_{i,t} + \beta_2 \text{ LEV}_{i,t} + \beta_3 \text{ SIZE}_{i,t} + \beta_4 \text{ InsHold}_{i,t} \\ + \beta_5 \text{ Indep}_{i,t} + \beta_6 \text{ DUAL}_{i,t} + \varepsilon_{it}$$

The first equation examines how the total value of intangible assets (IA) impacts firm value (measured by Tobin's Q) and firm performance (measured by ROA and ROE). The second equation, however, breaks down this analysis by exploring the individual effects of identifiable intangible assets, goodwill, and research & development (R&D) on the same metrics which is Tobin's Q, ROA, and ROE.

Firm Value's Empirical Model:

$$(11) \text{ Tobin's Q} = \beta_0 + \beta_1 \text{ IIA}_{i,t} + \beta_2 \text{ GW}_{i,t} + \beta_3 \text{ R\&D}_{i,t} + \beta_4 \text{ LEV}_{i,t} \\ + \beta_5 \text{ SIZE}_{i,t} + \beta_6 \text{ InsHold}_{i,t} + \beta_7 \text{ Indep}_{i,t} + \beta_8 \text{ DUAL}_{i,t} + \varepsilon_{it}$$

Firm Performance's Empirical Model:

$$(12) \text{ ROA}_{i,t} = \beta_0 + \beta_1 \text{ IIA}_{i,t} + \beta_2 \text{ GW}_{i,t} + \beta_3 \text{ R\&D}_{i,t} + \beta_4 \text{ LEV}_{i,t} \\ + \beta_5 \text{ SIZE}_{i,t} + \beta_6 \text{ InsHold}_{i,t} + \beta_7 \text{ Indep}_{i,t} + \beta_8 \text{ DUAL}_{i,t} + \varepsilon_{it}$$

$$(13) \text{ ROE}_{i,t} = \beta_0 + \beta_1 \text{ IIA}_{i,t} + \beta_2 \text{ GW}_{i,t} + \beta_3 \text{ R\&D}_{i,t} + \beta_4 \text{ LEV}_{i,t} \\ + \beta_5 \text{ SIZE}_{i,t} + \beta_6 \text{ InsHold}_{i,t} + \beta_7 \text{ Indep}_{i,t} + \beta_8 \text{ DUAL}_{i,t} + \varepsilon_{it}$$

To test whether firms with high and low intangible-intensive profiles (IIP) experience different effects of identifiable intangible assets (IIA), goodwill (GW), and R&D on firm value and performance (Hypothesis 2 or H2). This study will split the data into two groups based on the ratio of intangible assets to total assets. Firms with ratios at or above median were classified as intangible-intensive (IIP), while those below the median were labelled non-intangible-intensive (non-IIP). This division allowed us to compare how IIA, GW and R&D influence firm value (Tobin's Q) and firm performance (ROA and ROE) across the two profiles.

EMPIRICAL RESULTS

Descriptive Statistics

Descriptive statistical analysis is used to provide a comprehensive overview of the sample data collected in the study. This descriptive analysis also involves an interpretation of each emerging finding. Any trends or patterns identified in the data are analyzed, and logical conclusions are drawn to support the research statements.

Table 4.1. Descriptive Statistics

	Mean	Std. Dev	Minimum	Maximum
IA	0.0884682	0.1106505	0.0006116	0.6288004
RD_EXP	0.0417032	0.0410762	5.60e-06	0.4204474
GW	0.0542899	0.0833866	6.39e-06	0.6662182
IIA	0.0339667	0.047158	0	0.28833
FIRM_SIZE	6.967942	0.7393474	4.627051	9.743287
DEBT_EQUITY	0.4689726	2.185484	-11.406	94.92
DEBT_ASSET	0.1597137	0.1336601	0	0.772234
INSHOLD	17.87719	16.82863	0	79.4
BOARD_INDEP	0.4171846	0.1469035	0	0.909090
DUAL	0.444444	0.587414	0	10
TOBINS_Q	1.722359	1.558112	0.1140605	16.51044
ROA	0.040579	0.093124	-0.8745786	2.698479
ROE	0.0439034	1.176753	-63.24885	14.51148

Tobin's Q is the ratio of the market value of a firm to the replacement cost of its assets. A Tobin's Q greater than 1 indicates that the market values the company more than the book value of its physical and intangible assets. This suggests that the firm is expected to generate returns above the cost of capital, and investors believe that the company has valuable growth opportunities, strong intangible assets like R&D or brand equity, or other competitive advantages. In this case, since the average Tobin's $Q > 1$ across the Asia-Pacific IT firms in

my sample, we can interpret that these firms are perceived by the market as value-creating entities that possibly due to their innovation capacity, scalability, or intellectual capital.

The mean ROA and ROE are 4.06% and 4.38%, respectively. As a result, on average, Asia Pacific's Information Technology firms generated 4.06% and 4.38% profits from their assets and equity. Table 4.1 also presents intangible assets (IA) with its three components: research and development expenses, goodwill, and identified intangible assets, measured in ratio. As the previous study from (Intara & Suwansin, 2024), all the ratio is calculated as:

Table 4.4. Independent Variable Description

Types of Intangible Assets	Description	Measurement
Intangible Assets (IA)	The total of R&D, goodwill and identified intangible assets	Total intangible assets divided by total assets (IA/TA)
Identified Intangible Assets (IIA)	The value of the identified intangible asset can be subtracted from total intangible assets and goodwill	Total identified intangible assets divided by total assets (IIA/TA)
Goodwill (GW)	Goodwill value is reported from balance sheet	Goodwill divided by total assets (GW/TA)
Research and Development Expenses (R&D_EXP)	Research and development expenses is reported from profit and loss report in financial statement	Research and development expenses divided by total assets (R&D/TA)

Meanwhile, the independent variables, namely R&D expenses, goodwill, and identified intangible assets, have mean values of approximately 0.042, 0.054 and 0.035 respectively. For the control variables, the mean values are 6.97 (firm size), 57.09 (debt to equity), 0.16 (debt to assets), 17.88 (institutional holding), 16.68 (board independence), and 0.45 (CEO duality).

The descriptive statistics suggest that Asia Pacific's Information Technology firms, on average, create value (Tobin's $Q > 1$) and maintain moderate profitability (ROA: 4.06%, ROE: 4.38%). However, the wide ranges in key variables (e.g., Tobin's Q , ROE, and intangible assets) indicate substantial heterogeneity across firms, necessitating further regression analysis to assess the precise impact of intangible assets on firm valuation and performance.

Full Regression Results

The regression equation used in the study involves the dependent variable, Tobin's Q , as a firm valuation measure proxied by TOBINS_ Q , and Return on Asset and Return on Equity

as firm performance measures proxied by ROA and ROE. The independent variables include RD_EXP (research & development expenses), GW (goodwill), IIA (identified intangible assets), along with control variables in the study: FIRM_SIZE (firm size), DEBT_EQUITY (debt to equity), DEBT_ASSET (debt to asset), INSHOLD (institutional shareholding), BOARD_INDEP (board independence ratio), and DUAL (CEO duality). The regression equations for Tobin's Q, ROA, and ROE employ the Random Effect Model, the results of which can be seen in the following table.

Table 4.8. Regression Results (Tobin's Q = Independent Variable + Control Variable)

Dependent Variable: TOBINS_Q				
Regression with Driscoll-Kraay standard errors				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.762387	0.3330275	5.29	0.000
RAIA	-2.68795	4.079749	-0.66	0.525
RD_EXP	5.650231	1.412687	4.00	0.003
GW	4.869719	3.7768	1.29	0.226
IIA	5.645149	2.963114	1.91	0.086
FIRM_SIZE	0.0014685	0.0380255	0.04	0.970
DEBT_EQUITY	0.0012586	0.0028611	0.44	0.669
DEBT_ASSET	-2.159885	0.3181696	-6.79	0.000
INSHOLD	-0.0049751	0.0035448	-1.40	0.191
BOARD_INDEP	-0.0643456	0.2611939	-0.25	0.810
DUAL	-0.1637996	0.0458217	-3.57	0.005

The independent variables of RD_EXP (R&D Expenses) has the t-statistics value of 4.00 with a Prob. value (significance) of 0.003 (<0.05). This can be concluded that the RD_EXP variable has a significance influence in dependent variable (TOBINS_Q). In this finding, we can also conclude that firms that invest more in research and development are likely to have higher market valuation relative to their asset base. This is consistent with the theoretical view that firms that do R&D activities give the good innovation potential and future earnings growth, which this one is positively valued by investors (Lev & Sougiannis, 1996). In fact, R&D-intensive firms often operate in sectors where intangible capital is critical to competitive advantage, such as technology and pharmaceuticals (Eberhart et al., 2004.).

Therefore, investors incorporate these expectations into the firm's valuation, thereby increasing Tobin's Q.

The next independent variable is GW (Goodwill) has the t-statistics value of 1.29 with a Prob. value (significance) of 0.226 (>0.05). This can be concluded that the GW variable hasn't a significance influence in dependent variable (TOBINS_Q). Here also we can conclude that firms with higher goodwill often to arise from acquisitions and tend to have a higher market valuation. As mentioned also in previous study by (Lev, 2001), goodwill reflects reputation, brand strength, customer loyalty, and synergies obtained through business combinations. These are valuable intangible assets that are not easily replicated by competitors.

The last independent variable is IIA (identified intangible asset) has the t-statistics value of 1.91 with a Prob. value (significance) of 0.086 (>0.05). This can be concluded that the IIA variable has a significance influence in dependent variable (TOBINS_Q). These assets may include patents, trademarks, and customer relationships that are recognized separately during acquisitions. As stated by (Wyatt, 2012), intangible assets like intellectual property are crucial in value creation, particularly in knowledge-based industries. Therefore, their presence enhances the firm's perceived value in the market.

For the control variable, including debt to asset (DEBT_ASSET), institutional shareholding (INSHOLD) and CEO duality (DUAL) have the t-statistics value of -6.79, -1.40 and -3.57 respectively and the Prob. value (significance) of 0.000, 0.191, and 0.005 respectively which can be concluded that these three control variables (debt to asset, institutional shareholding and CEO duality) have a significance influence in dependent variable (TOBINS_Q). Although these three variables have a significance influence, these three have a negative impact toward Tobin's Q (firm valuation).

The first one, debt-to-asset control variable that suggest that higher financial leverage is more associate with lower firm valuation. This also aligns with traditional financial theory, namely pecking order theory, firstly introduced by (Donaldson, 1961), which suggests that higher debt levels increase financial risk and bankruptcy costs, leading to lower market value. (Chen, 2011) also found a negative relationship between leverage and Tobin's Q, indicating that investors penalize overly-leveraged firms. The second one, higher institutional ownership is associated with lower Tobin's Q. This finding is somewhat unexpected and could suggest that in certain contexts (e.g., emerging markets), institutional investors might act more as passive monitors rather than active value enhancers. Alternatively, high institutional ownership might signal governance concerns or agency conflicts, as discussed in previous research studies like (Ferreira & Matos, 2008). The last one, CEO duality means that when the same person serves as both CEO and chairman, it negatively affects firm valuation. This result supports the agency theory argument that CEO duality can reduce the effectiveness of the board's oversight and lead to decisions that benefit management at the expense of shareholders.

Table 4.9. Regression Results (ROA = Independent Variable + Control Variable)

Dependent Variable: ROA				
Regression with Driscoll-Kraay standard errors				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.0094131	0.0181581	0.52	0.615
RA_IA	0.7730335	0.7793753	0.99	0.345
RD_EXP	0.158053	0.069071	2.29	0.045
GW	-0.7576204	0.7447538	-1.02	0.333
IIA	-0.984498	0.846976	-1.16	0.272
FIRM_SIZE	0.004702	0.0017458	2.69	0.023
DEBT_EQUITY	-0.0023346	0.0009508	-2.46	0.034
DEBT_ASSET	-0.1322608	0.0127948	-10.34	0.000
INSHOLD	0.0008852	0.0002069	4.28	0.002
BOARD_INDEP	0.0101193	0.007876	1.28	0.228
DUAL	0.000442	0.0029956	0.15	0.886

For the regression analysis that shown above is ROA (Return on Asset) as a one of the firm performance dependent variable. The independent variables of RD_EXP (R&D Expenses) has the t-statistics value of 2.29 with a Prob. value (significance) of 0.0045 (<0.05). This can be concluded that the RD_EXP variable has a significance influence in dependent variable (ROA). In here the writer analyze that firms that allocate more resources to research and development activities tend to generate higher returns on assets. From a theoretical perspective, R&D spending drives innovation, which can lead to new products, improved processes, and increased operational efficiency, this will boost future potential profitability. The previous theory that mentioned in the literature review, this is supported also by resource-based view, which emphasizes that intangible capabilities such as R&D provide sustainable competitive advantages. Previous study, (Lev & Sougiannis, 1996) and (Eberhart et al., n.d.) also found similar results showing that R&D investment significantly enhances firm performance metrics, including ROA.

For the control variables, including firm size debt to equity (DEBT_EQUITY), debt to asset (DEBT_ASSET) and institutional shareholding (INSHOLD) has a t-statistics value of -2.46, -10.34, and 4.28 respectively with a Prob. Value of 0.034, 0.000 and 0.002 respectively

which can be concluded that these three control variables have a significance influence in dependent variable (ROA). Debt to equity ratio and debt to assets ratio have a negative impact, but only institutional shareholding has a positive impact on ROA.

The first one, debt to equity ratio suggests that Higher debt relative to equity implies greater financial risk, which can reduce profitability due to increased interest burden and pressure to meet fixed obligations. This is consistent with findings by (Abor, 2005), who observed a negative relationship between leverage and profitability in emerging markets. The second one, debt to asset ratio, this reinforces the idea that over-leveraged firms tend to underperform in terms of asset utilization and profit generation. It also supports (Chen, 2011) who observed that higher financial leverage decreases operational performance. The last one, the greater the institutional ownership, the greater it will enhance firm performance, possibly due to better monitoring and governance. This finding aligns with (Shleifer & Vishny, 1997) who argue that institutional investors can play an effective role in reducing agency costs and improving profitability.

Table 4.12. Regression Results (ROE = Independent Variable + Control Variable)

Dependent Variable: ROE				
Regression with Driscoll-Kraay standard errors				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.1313412	0.0169059	-7.77	0.000
IA	1.809727	2.023683	0.89	0.392
RD_EXP	0.9756778	0.272222	3.58	0.005
GW	-1.559058	1.820768	-0.86	0.412
IIA	-2.904357	2.781266	-1.04	0.321
FIRM_SIZE	-0.0123536	0.0141978	-0.87	0.405
DEBT_EQUITY	-0.4324402	0.2230114	-1.94	0.081
DEBT_ASSET	1.38251	0.6319033	2.19	0.054
INSHOLD	0.0048229	0.0019132	2.52	0.030
BOARD_INDEP	0.312915	0.1329836	2.35	0.040
DUAL	-0.0246991	0.141728	-1.74	0.112

For the regression analysis shown in the table above is ROE (return on equity) as one of the firm performance dependent variable. The independent variables of RD_EXP (R&D

Expenses) has the t-statistics value of 3.58 with a Prob. Value (significance) of 0.005 (<0.05). This can be concluded that the RD_EXP variable has a significance influence in dependent variable (ROE). It means firms with the greater investment in R&D will enhance a firm's return on equity. This result is consistent with the Resource-Based View (RBV) theory, which R&D creates unique intangible resources like technology, innovation, and know-how so that can improve financial performance and competitiveness. This also supported by (Lev & Sougiannis, 1996) and (Chen, 2011) that firms with higher R&D intensity tend to generate higher profitability and shareholder returns over time. Therefore, the result indicates that R&D activities are not just expenses, but value-generating investments that enhance equity returns.

The next independent variable is IIA (identified intangible asset) has the t-statistics value of -1.04 with a Prob. Value (significance) of 0.321 (<0.05). This can be concluded that IIA variable has a significance influence in dependent variable (ROE). Although this variable have the negative impact toward ROE. We analyse that IIA such as licenses, trademarks, and customer lists (often recorded through acquisitions), may not always be revenue-generating in the short term. Their amortization and potential overvaluation can depress net income, reducing ROE. (Wyatt, 2012) also mention that not all intangibles contribute equally to financial performance, especially those that arise externally (through M&A) rather than internally developed.

For the control variables, including debt to equity (DEBT_EQUITY), debt to asset (DEBT_ASSET), institutional shareholding (INSHOLD) and board independence (BOARD_INDEP) has a t-statistics of -1.94, 2.19, and 2.52 respectively with a Prob. Value (significance) of 0.081, 0.054, 0.030, 0.040 (<0.05) which can be concluded that these control variables have a significance influence in dependent variable (ROE).

The first one, debt to equity ratio is consistent with pecking order theory that excessive debt can increase financial risk and interest burden, which reduces net income available to shareholders. The second one, debt to asset ratio suggests that firms are able to use debt efficiently to enhance returns to equity holders, especially if the cost of debt is lower than the return on assets example like positive financial leverage effect. The third one is institutional shareholding have the resources and incentives to monitor management more effectively, thus reducing agency problems and improving profitability. The last one is board independence suggests that having more independent directors may lead to better decision-making, oversight, and ultimately better returns for equity holders. This also supported by previous research by (Fama & Jensen (Deceased), 1998), who argue that independent boards can reduce agency conflicts, protect shareholder interests, and improve firm outcomes. The result also confirms recent governance literature emphasizing board structure as a key determinant of firm performance.

The control variables include firm size, debt to equity, debt to asset, institutional holding, board independence, and CEO duality. Firm size refers to the size of a company, measured by its market capitalization. Debt to equity and debt to asset are control variables for

leverage (used to assess the level of debt in a company). Institutional holding represents the percentage (%) of shares held by institutions or corporations, rather than individual shareholders. Among the control variables, board independence measures the proportion of independent directors or commissioners within the board of directors or board of commissioners. Lastly, CEO duality examines how many companies have a CEO who simultaneously serves as Chairman of the board while performing the company's executive role as CEO.

Intangible Intensive Profile (IIP) with the impact of IA on firm valuation and firm performance.

To get deeper insights into how intangible assets affect firm value and performance, this study divides the sample into two groups: Intangible-Intensive Profile (IIP) firms and Non-Intangible-Intensive Profile (non-IIP) firms. This grouping is based on each company's ratio of total intangible assets to total assets (IA/TA). Companies with ratios at or above the median are classified as IIP firms, while those below the median fall into the non-IIP category. The reason behind this classification is that companies vary in how much they rely on intangible resources to drive their operations and growth. IIP firms typically dedicate a larger share of their assets to elements like R&D, software, patents, trademarks, and goodwill. These firms, especially those in sectors like information technology often depend heavily on innovation and knowledge-based assets to maintain competitiveness and create value over time. In contrast, non-IIP firms may still hold intangible assets, but they place more emphasis on physical or tangible resources. As a result, the way intangible assets influence value and performance in these firms might not be as significant or direct.

By separating the sample in this way, we can see to understand whether the impact of intangible assets varies depending on how much firms depend on them. This approach allows for a clearer comparison between the two groups and offers a clearer view of how different types of companies benefit from their intangible investments. This classification also serves as one of the unique contributions of the study. It provides a framework to explore whether firms with higher intangible intensity actually gain greater advantages in terms of firm valuation and financial performance. This supports the second hypothesis (H2) and its sub-hypotheses (H2A, H2B, H2C), which propose that the benefits of intangible assets, such as R&D, goodwill, and identifiable intangible assets that are more pronounced in IIP firms.

The table below evaluates the effect of each component of intangible assets (IIA, GW, and R&D) on firm valuation and performance, in order to observe whether intangible-intensive profile (IIP) firms strengthen the impact of intangible assets on firm valuation and performance (H2). In this study, 153 companies are classified as intangible-intensive profile (IIP) firms and the other 153 companies are classified as non-intangible intensive profile (non-IIP) firms.

Table 4.10. Effect of intangible assets on firm value and performance separated by IIP and Non-IIP firms (t-statistics in bracket).

	Tobin's Q		ROA		ROE	
	Non-IIP Firms	IIP Firms	Non-IIP Firms	IIP Firms	Non-IIP Firms	IIP Firms
Constant	omitted	omitted	omitted	omitted	omitted	omitted
IA	0.1751956** [2.87]	0.0052915* [0.32]	-0.0013201* [-0.73]	0.0027054** [3.43]	0.0048556* [1.29]	0.009741* [4.94]
RD_EXP	0.0304271* [1.08]	0.0357309* [1.22]	-0.0000214* [-0.02]	-0.00024* [-0.12]	0.0052604** [2.67]	0.004468** [1.23]
GW	-0.202829** [-4.50]	0.0375513** [2.34]	0.0033092* [1.17]	0.001544* [1.58]	-0.012023* [-1.77]	-0.00256* [-1.38]
IIA	-0.222613** [-3.63]	-0.1189899** [-2.94]	-0.0000844* [-0.02]	-0.008588** [-2.91]	-0.015027* [-2.19]	-0.02128** [-3.66]
FIRM_SIZE	0.1043529** [2.55]	-0.0287061* [-0.30]	0.0005255* [0.17]	0.00256* [0.51]	0.0011552* [0.38]	0.0102855* [1.45]
DEBT_EQUITY	-0.2437243* [-1.79]	-0.0589992* [-0.97]	-0.0119102* [-0.26]	-0.0316431* [-1.61]	-0.089674** [-2.77]	-0.23847** [-6.78]
DEBT_ASSET	0.0925387* [0.18]	-1.749666* [-2.09]	-0.2404763* [-1.36]	-0.1692892* [-1.97]	-0.0689256* [-0.58]	0.308932** [3.10]
INSHOLD	0.0401581** [2.53]	0.1343029** [4.88]	0.0053574** [3.37]	0.0027327* [1.40]	0.0071627** [5.45]	0.0006286* [0.26]
BOARD_INDEP	omitted	omitted	omitted	omitted	omitted	omitted
DUAL	omitted	omitted	omitted	omitted	omitted	omitted

**p < 0.05, *p > 0.05

The research and development expenses (RD_EXP) has a positive coefficient across both IIP and non-IIP firms, this suggests that R&D generally contributes positively to firm value and performance. But in case of Tobin's Q, the coefficient is slightly higher for IIP firms (0.0357309) compared to non-IIP firms (0.0304271), indicating a potentially stronger effect of

R&D on firm valuation among IIP firms. When assessing firm performance through ROA, R&D expenses also show a positive coefficient in both groups, with a slightly higher value for non-IIP firms (-0.0000214 and -0.00024). When assessing firm performance through ROA, R&D expenses also show a positive coefficient in both groups, with a slightly higher value for non-IIP firms (0.0052604 vs. 0.004468). However, R&D expenses on Tobin's Q, ROA and ROE have no significance influence since the Prob. Value > 0.05.

Goodwill (GW) has a positive coefficient across all models and both firm groups, indicating that goodwill generally contributes positively to firm value and performance, although the statistical significance varies. For Tobin's Q, the effect is slightly higher in non-IIP firms (-0.202829, $t = -4.50$) than in IIP firms (0.0375513, $t = 2.34$). When it comes to ROA, goodwill remains positive in IIP firms (0.001544, $t = 1.58$) but is slightly positive in non-IIP firms (0.0033092, $t = 1.17$), suggesting that goodwill might have a more favorable effect on asset returns in intangible-intensive firms. Similarly, in the ROE model, the coefficient is negative for non-IIP firms (-0.012023, $t = -1.77$), while slightly negative for IIP firms (-0.00256, $t = -1.38$). However, goodwill on Tobin's Q, ROA and ROE have significance influence since the Prob. Value < 0.05.

Identified Intangible Assets (IIA) have a negative impact in all across IIP and Non IIP firms. For Tobin's Q, the coefficients are negative in both groups. In non-IIP firms, the coefficient is -0.0222613, while in IIP firms, the effect is more negative (-0.1189899). For ROA, the coefficient for IIA is again negative in both groups. It is -0.0000844 for non-IIP firms and slightly lower at -0.008588 for IIP firms. For ROE, the coefficient is negative for non-IIP firms (-0.015027), while negative in IIP firms (-0.02128).

CONCLUSION AND SUGGESTIONS

Conclusion

This study explores how intangible assets, with more specific which is R&D, goodwill, and identifiable intangible assets affect firm value and financial performance in Information Technology companies across the Asia-Pacific region. Our main focus is to examine whether intangible assets specifically identifiable intangible assets (IIA), goodwill (GW), and research and development expenses (R&D) positively associated Tobin's Q, ROA, and ROE, and whether these effects have a different between intangible-intensive profile (IIP) firms and non-IIP firms. The overall hypothesis that intangible assets positively associated firm value and performance (H1). While most components show a positive effect, the results are not consistently significant across all models. So H1 is accepted. Goodwill (GW) shows a generally positive relationship with firm value and performance, but the results are not statistically significant in most cases. So H1B is accepted. R&D expenses have a positive and significant effect on ROE in the full-sample regression, suggesting some relevance. So H1C is accepted. Regarding the second hypothesis (H2), which examines whether Intangible-Intensive Profile (IIP) firms enhance the positive impact of intangible assets on firm value and performance. In most cases, the regression results show that the coefficients of intangible asset variables which is identifiable intangible assets (IIA), goodwill (GW), and R&D expenditure (RD_EXP) are higher in IIP firms than in non-IIP firms. This pattern suggests that IIP firms tend to benefit

more from their intangible assets, particularly in terms of firm value (Tobin's Q), so H2 is accepted. However, the differences between these 2 groups are not significant. Another sub-hypothesis, H2A, H2B, and H2C are all partially supported, the coefficients for IIA, GW, and R&D are generally larger in IIP firms across most dependent variables, especially Tobin's Q and ROE. Although the lack of strong significance, these results still indicate a directional tendency that supports the assumption that IIP firms may be better positioned to convert intangible assets into greater firm value and firm performance outcomes.

So this study already answers the first research problem whether intangible assets influence firm value and financial performance. The regression results show that R&D and goodwill significantly increase firm value (Tobin's Q). R&D also has a positive effect on ROE. This supports the view that intangible assets play an important role in driving firm value and profitability, particularly for growth-oriented sectors like information technology sector. It's also answer the second research problem that R&D has the most consistent and significant positive effect, supporting H1C. Goodwill positively affects firm value, supporting H1B. However, IIA surprisingly shows a negative and significant relationship with ROE, meaning H1A is not supported. The last research problem also already answered that IIP firms show stronger value/performance effects than non-IIP firms. When the sample is split into IIP and non-IIP, the coefficients of IIA, GW, and R&D are higher in IIP firms for Tobin's Q and ROE. Although these results are not statistically significant, we suggest that IIP firms tend to benefit more from intangible assets.

Scope and Limitations of the Research

This study has several limitations that should be acknowledged:

1. The research is only limited to publicly listed information technology sector firms in the Asia-Pacific region. As a result, the findings may not be generalizable to other industries, especially those where intangible assets behave differently (example manufacturing, retail, or heavy industry).
2. While the sample covers various Asia-Pacific countries, the study does not control for country-level differences in accounting standards, regulatory environments, or economic development. These factors may influence how intangible assets are recognized and their impact on firm outcomes.
3. While the comparison between IIP and non-IIP firms shows higher coefficients in IIP groups, many of the subgroup regression results are not statistically significant, limiting the strength of the research interpretation.

Suggestions for Future Research

To build on the findings of this study, future research may consider:

1. Future studies can apply the same framework to other sectors such as healthcare, fintech, or consumer goods to explore whether the influence of intangible assets is industry-specific.
2. Future research could integrate qualitative variables such as the level and transparency of intangible asset disclosures

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