Do Size and Age of Acquisition Goodwill Matter for Value Relevance? Evidence from Thai Listed Firms

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ABSTRACT

Manuscript type: Research paper
Research aims: To examine the value relevance of total and age-based goodwill of different sizes.
Design/Methodology/Approach: The study modifies Ohlson (1995) model and uses data from top 100 listed firms on the Stock Exchange of Thailand.
Research findings: Goodwill of all ages has no significant effect on market value in the full sample, but it is value relevant in a subsample of firm-years with relatively large goodwill. Its value relevance persists in the years following acquisitions because goodwill impairment losses are infrequent and small.
Theoretical contribution/Originality: Updated and long-period databases are applied to contribute to empirical literature on value relevance of goodwill by size and age in emerging economies.
Practitioner/Policy implications: Targets should be strategically chosen to provide future earnings corresponding to increased amount of goodwill. Accounting standard setters should provide timely and high-quality information to benefit investors' decision-making. The government should provide a conducive environment for acquirers and targets to develop goodwill for firm and economic growth.
Research limitation: More studies from additional emerging markets, expanded database, and variety of research methods are needed to generalise the results.

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1. Introduction

In today's rapidly changing business environment, mergers and acquisitions (M&As) have been used more frequently by firms to increase their investment returns and lower business risks. Acquiring firms are willing to pay more for targets that are likely to generate the most synergies and result in the greatest future financial gains after the M&As. When the price paid by the acquiring firm is higher than the fair value of the target's identifiable net assets, the positive difference is called goodwill. Thus, goodwill results only from acquisitions. It is recognised in financial statements by acquiring firms as a noncurrent asset or an unidentifiable intangible asset that can potentially generate benefits to the combined firms in the future. However, it cannot be sold separately from the target and is not legally protected.

Sands (1963) regards goodwill as expected future earnings that exceed normal profits due to market imperfections, and Bloom (2008) defines it as the rent generated by legal protection on the use of the target's assets over competitors of the acquiring firm. Nelson (1953) views goodwill as the amount potential buyers are willing to pay the target to avoid the cost of starting a new business from scratch. Meanwhile, Johnson and Petrone (1998) distinguish core goodwill from other goodwill components and specified it as the component crucial for acquirers to earn an abnormal return after a business combination. Core goodwill comprises internally-generated goodwill or a going concern of the target and synergistic benefits. Lonergan (1995) labels goodwill as an unidentifiable intangible asset that captures the quality of management team, know–how, marketing expertise, distribution network, economies of scale, technical skills, locational advantage, advertising impact, customer loyalty and synergies between the acquirer and the target. On the whole, within financial statements, goodwill is a as noncurrent asset with the potential to generate future extraordinary returns to the combined firms.

Despite the extra earnings generation power of goodwill, it is unclear whether the amount reported in financial statements fully contain information allowing equity investors to evaluate its value consistent with its potential future benefits and thus the market value of the firms. If it does, we would identify the goodwill information

as value relevance. Many studies have examined the value relevance of goodwill information in developed countries, but those in emerging and developing countries are scant. Selected literature from the developed countries to be reviewed in the following section show that the total goodwill balance in total assets is increasingly prominent and becoming value relevant. The size of goodwill matters in the investigation of its value relevance. Large goodwill tends to be more value relevant than other intangible assets. However, there is no consensus on the effect of goodwill classified by age on firms' market value. The synthesis of all findings from the literature will be used to form hypotheses of this study.

We aim to study the topic because the extant literature in emerging countries, particularly Thailand, is limited. Tangeakchit et al. (2019) examine the value relevance of total goodwill balance using data from Thai listed firms from 2012 to 2016 and conclude that besides the book value of equity excluding goodwill and net income, goodwill balance provides investors with relevant information for determining the value of the firms. Rojanarat (2007) examines the value relevance of goodwill and other intangible assets using a sample of publicly traded companies from 2001 to 2006 and finds that both assets have a significantly positive impact on companies' stock prices. However, Daorueng et al. (2020) use the data of listed firms from 2014 to 2019 to demonstrate that goodwill and identifiable intangible assets have no significant effect on share prices because the amount of each asset is small to reflect the market value of the firms. The proportion of goodwill to total assets is only 2 per cent, whereas that of identifiable intangible assets to total assets is 5 per cent.

Evidently, not only are the studies on the value relevance of goodwill in Thailand exceeding rare and rudimentary, but there is also no consensus on the value relevance of goodwill and identifiable intangible assets. Each study's duration is extremely brief with none exploring the value relevance of goodwill by age. Thus, we contribute to the limited literature by applying a set of updated and long-period database to the carefully-specified estimation models. We search for evidence of the effects of goodwill balance in total amount and by age on the market value of acquiring firms in Thailand by using data from the 100 largest listed firms on the Stock Exchange of Thailand (SET). These firms are selected because their market capitalisation is large and correlated with the level of their market efficiency (Sukpitak and Hengpunya, 2016). They are also firms that engage in the most domestic and cross-border M&As. If the effect of goodwill on stock prices is significantly positive, it will constitute evidence

that goodwill is value relevant in emerging economies as well. Apart from determining the effect of the total amount of goodwill balance on stock prices, we shall also disaggregate the total amount into goodwill acquired over different periods to examine whether the value relevance of goodwill persists over time.

Our empirical research findings are expected to contribute to the limited knowledge literature on the value relevance of accounting and financial information with special focus on the impact of the amount of goodwill on the market value of acquiring firms in Thailand, which is a relatively large emerging market in the ASEAN region. Over the last two decades, the Thai economy has grown at a higher rate than the global average (OECD, 2021), and the value of M&As has increased from the late 1990s to 2019, directly before the emergence of the COVID-19 pandemic. Its average growth rate of nearly 10 per cent per year was higher than the global and Asia-Pacific developing countries' average rates (Institute for Mergers, Acquisitions and Alliances, 2019). Furthermore, the average proportion of positive goodwill in the purchase price for firms in all nonfinancial industries is 47.30 per cent (Poramapojn and Wiboonchutikula, 2024), and the amount of goodwill to total assets has been increasing over the last decade (see Section 4). Indeed, it is interesting to know more about the value relevance of goodwill and to draw policy implications for the acquiring firms to grow and contribute to Thailand's economic development.

The remainder of this paper is organised as follows. Section 2 introduces the conceptual framework and reviews the empirical literature on goodwill value relevance in various countries to formulate the study hypotheses. Section 3 presents our estimation models and the database to be used for investigating the effects of total goodwill balance and goodwill by age on the market value of acquiring firms in Thailand. Section 4 reports and discusses the study findings. Lastly, Section 5 summarises and concludes the findings on the value relevance of goodwill and implications for M&As that benefit the acquiring firms and the whole economy.

2. Concept, Empirical Literature and Hypotheses Development

Investors seek information to assess a firm's value and maximise equity returns. Information in a financial statement is deemed value relevant if it is fully captured by the firm's market value as represented by stock prices, under the assumption of market efficiency. Fama (1970) introduces the concept of the Efficient Market

Hypothesis (EMH) in three different forms: strong, semi-strong, and weak. According to the strong form, the market is believed to be extremely efficient whereby stock prices reflect all privately and publicly available information of the firm and its market as a whole. For the semi-strong form, stock prices reflect purely on publicly available information released in the firm's financial statement and other media. Finally, in the weak form, stock prices reflect only historical or past prices in the stock market. Most studies investigating the value relevance of accounting information employ the concept of EMH in the semi-strong form because they focus directly on the effect of the information from the financial statement on the market value or stock prices only (Acaranupong, 2021; Al Jifri & Citron, 2009; Omarjee et al., 2019).

Goodwill is a balance sheet item that reflects an acquiring firm's anticipated future earnings. Based on the concept that the stock market is efficient in the semi-strong form, it is value relevant if investors can use the disclosed amount to predict a firm's market value after a business combination and consequently, increase their investment returns. A widely-used approach to assess the value relevance of goodwill or all other financial information is based on the Ohlson (1995) model. It is an accounting-based valuation model where the firm's value is expressed in accounting variables, namely, the book value of various net assets and net income.

The empirical literature on the value relevance of goodwill measures investor reactions to the amount of goodwill balance on a firm's market value or stock prices and is mostly conducted in developed countries. We shall review the literature and use the synthesis to formulate various hypotheses on the effect of total goodwill balance on stock prices, the effect of goodwill relative to other identifiable intangible assets and finally, the effect of goodwill acquired at different periods in Thailand.

The first hypothesis is the effect of total goodwill balance on an acquiring firm's market value. Although studies use different methods and datasets, findings are quite in common, namely, total goodwill has a significant effect on stock prices. In early 1990s studies, Chauvin and Hirschey (1994) uses a three-part recursive system of simultaneous equations to compare the effect of goodwill balance on the market price of the common stock of acquirers in the US from 1989 to 1991. They find that goodwill has a significantly positive effect on the market value of firms in the nonmanufacturing sector because they can benefit from future revenue and cost savings generated by unidentifiable intangible assets such as reputational value. McCarthy and Schneider (1995) examine the effect of goodwill

balance using data from US publicly traded companies from 1988 to 1992, concluding that because goodwill a productive asset to the same extent as other assets, goodwill balance positively affects stock price. Meanwhile, Jennings et al. (1996) examine the effect of goodwill balance on the market value of US nonfinancial firms from 1982 to 1988. They find that goodwill to total assets increases over time and goodwill balance has a significantly positive effect on the market value of common stock, as firms with M&As tend to be intrinsically more profitable than others. Furthermore, after an acquisition, goodwill incorporates benefits from the target firm's pre-acquisition goodwill and other M&A benefits that are not captured in the fair value of the target's net assets. In the 2000s, an increasing number of studies use an alternative method based on the Ohlson (1995) model to explore the value relevance of total goodwill balance. Examples are Petersen (2006) for Denmark across 1984-1997, Al Jifri and Citron (2009) for the US in 2002 and Eloff and de Villiers (2015) for South Africa over 2001-2009. All find that the disclosed goodwill amount has a significantly positive impact on stock prices, and they attribute the effect to the acquiring firms' ability to generate super earnings power, market efficiency and expected future cash flows.

According to most studies in developed countries, total goodwill balance is value relevant. Investors recognise goodwill as an unidentifiable intangible asset capable of generating expected future earnings. Once the goodwill amount is released to the public, it is fully captured by the stock prices. Thus, we propose the following hypothesis:

> *H_1: Total goodwill balance accumulated from goodwill acquired from different acquisitions and periods is value relevant.*

The second hypothesis considers the effect of goodwill on the stock price relative to identifiable intangible assets. Most of the following literatures find that all types of accounting information disclosed in financial statements have a significantly positive effect on a firm's stock prices. However, goodwill is more value relevant than all other assets, particularly when goodwill in total assets is large relative to the rest. Godfrey and Koh (2001) explore Australian firms in 1999 and conclude that disclosed information on total intangible assets significantly and positively affects share prices. However, when total intangible assets are disaggregated into goodwill, capitalised R&D and identifiable intangible assets (e.g. patents, brand name and licences), all but capitalised R&D are value relevant. In particular, the amount of capitalised R&D to total assets is much smaller than that

of goodwill to total assets, and goodwill is more value relevant than all other assets in the balance sheet. Shahwan (2004) compares the market value effect of goodwill with various types of assets, using data from Australian firms during 1997–2000. Although the effects of all accounting variables on stock prices are significantly positive, the magnitude of each asset's effect varies. It is highest for goodwill and lowest for identifiable intangible assets. Goodwill explains stock price variation better than other assets because it is correlated with an omitted variable, particularly acquirers' internally-generated goodwill, which is not visible in financial statements.

In recent decades, a number of studies have used the Ohlson (1995) model to compare the value relevance of goodwill balance with identifiable intangible assets. Most studies find that both identifiable and unidentifiable (goodwill) intangible assets are value relevant, but goodwill has a greater impact on stock prices than other assets. For example, Dahmash et al. (2009) use Australian firm data from 1994 to 2003 and discover that although both assets have a significantly positive impact on the stock price, the market attaches greater value to goodwill than to identifiable intangible assets. This is because investors believe that goodwill is understated, whereas identifiable intangible assets are overstated in the financial reports under the goodwill amortisation accounting standard. Oliveira et al. (2010) examine the value relevance of goodwill in comparison with identifiable intangible assets disaggregated into intellectual property and rights, R&D expenditure, and other intangible assets using data from nonfinancial listed firms in Portugal across 1998-2008. The results show that all assets are value relevant, except for intellectual property rights due to its relatively small proportion in total assets. Ji and Lu (2014) and Kimouche and Rouabhi (2016) study the effect of goodwill and other intangible assets on the market value of listed firms in Australia (2001–2009) and France (2005–2013), respectively. They both discover that although both goodwill and identifiable intangible assets can explain the variation of stock prices, goodwill as a percentage of total assets is relatively large and has a greater impact on stock prices than all other types of intangible assets. Consequently, the amount of goodwill relative to other intangible assets has an effect on its value relevance, leading to the following hypothesis:

> *H_2: The size of goodwill matters in the investigation of the value relevance of goodwill relative to other assets.*

The third hypothesis considers the effect of goodwill classified by age on its market value. Since goodwill balance is an accumulation of

various M&A transactions from different periods, the value relevance of goodwill acquired at different times may vary. Besides, different studies also present varying results. Bugeja and Gallery (2006) apply the Ohlson (1995) model to separate goodwill balance by age and examine how Australian investors value goodwill acquired in various periods during the goodwill amortisation accounting standard from 1995 to 2001. They discover that goodwill acquired in the year of acquisition, the year prior and two years prior all have a significant positive impact on the firm's market value. In contrast, goodwill acquired more than two years does not. Essentially, the value of goodwill recognised by investors decreases with age to a maximum of two years. That is, investors do not view aged goodwill as an asset. They offer two justifications. First, the unidentified future economic benefits represented by goodwill are rapidly consumed. Second, the benefits of internally-generated goodwill and anticipated synergies following a business combination are quickly absorbed by net income and consequently incorporated into the firm's normal performance.

Bepari and Mollik (2017) apply the model of Bugeja and Gallery (2006) to examine the value relevance of goodwill by age in Australia using an updated dataset from 2006 to 2009, when the goodwill accounting standard shifted from amortisation to impairment charges. They find a different conclusion that older goodwill is value relevant, whereas goodwill acquired in the current year is not. Under the new impairment regime, acquiring firms with high investment opportunities can maintain goodwill balances through infrequent and small goodwill write-offs, whereas firms with low investment opportunities are required to adjust for impairment losses more frequently.

Inspired by Bugeja and Gallery (2006) (under the goodwill amortisation standard) and Bepari and Mollik (2017) (under the goodwill impairment standard), Omarjee et al. (2019) examine the value relevance of goodwill under the goodwill impairment standard in South Africa over 2010-2013. They find that the positive effect of goodwill on stock prices is not statistically significant until two years after the acquisition date, suggesting that the value relevance of goodwill increases as time passes. They explain that the amount of goodwill acquired in the current year captures only preliminary information that investors cannot use to determine a firm's market value. However, as new information is collected and incorporated into the adjusted goodwill amount in later periods, investors' confidence in the new goodwill number as an indicator of acquiring firms' future cash flows increases, which is reflected in stock price fluctuations.

Pechlivanidis et al. (2022) examine the value relevance of goodwill ages of nonfinancial listed firms in Greece from 2007 to 2018 and compare the results between the subperiods preceding the debt crisis of 2009 and after from 2010 to 2018. The results indicate that the goodwill balance is value relevant in both subperiods. Interestingly, goodwill is more value relevant during the subperiod of the debt crisis than it was before the crisis. This is because investors perceive M&As in turbulent times as a strategy that could help firms improve their future performance, which is reflected by the amount of goodwill. Accordingly, current year acquired goodwill is more value relevant than older goodwill because investors attach greater expectations on the benefits of goodwill immediately after implementing a business combination strategy than uncertain future prospects.

Apparently, the literature shows that the effect of goodwill of different ages on the market value of the firm is ambiguous. Some studies find that goodwill is value relevant to the maximum of two years while others find that the value relevance of goodwill increases with age. The current year goodwill contains only preliminary information, but old goodwill has been adjusted for updated information and earnings forecast in the following years under the current goodwill impairment accounting standard. Therefore, we propose the following hypothesis:

H_3: The value relevance of goodwill varies with its age.

3. Estimation Models and Sample Data

We use the Ohlson (1995) model as the conceptual foundation for our study on the value relevance of goodwill, and we apply Bugeja and Gallery's (2006) estimation model to analyse the effects of total goodwill balance, other assets and goodwill disaggregated by age on the market value of the firm. Ohlson (1995) show that firm's market value is determined by two key information from financial statements, namely, the book value of equity from the balance sheet and the net income from the income statement. The operational relationship can be expressed as follows.

$$MVE_{i,t} = \alpha_0 + \alpha_1 BVE_{i,t} + \alpha_2 NI_{i,t} + \varepsilon_{i,t}$$

All the above variables are on a per-share basis to cope with the scale effect problem.

Using Ohlson (1995) and Barth and Clinch (1996) as foundation,

Bugeja and Gallery (2006) study the value relevance of individual assets by disaggregating the book value of equity into three major assets: identifiable intangible assets, goodwill and the remaining balance. Moreover, they examine how long-term investors value goodwill acquired at various times as an asset by further disaggregating goodwill by acquisition year.

Our goodwill value relevance estimation model modifies the Ohlson (1995) model by adding three control variables and employing Bugeja and Gallery's (2006) approach to decompose the book value of equity into components. We further separate goodwill into goodwill acquired in the current year, the previous few years and the remaining goodwill balance to test whether we could confirm Bugeja and Gallery's (2006) results that goodwill's economic value is up to the maximum of a few years. In each of the following estimation equations, the book value of equity, including goodwill, is disaggregated step by step.

Model (1) is the modified Ohlson (1995) model.

$$MVE_{i,t} = \alpha_0 + \alpha_1 BVE_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 SIZE_{i,t} + \alpha_4 INVOPP_{i,t} + \alpha_5 ECON_t + \varepsilon_{i,t} \quad (1)$$

The three additional control variables are *SIZE*, *INVOPP* and *ECON*. The first two variables are firm-specific, whereas the third variable is macroeconomic.

Model (2) separates the book value of equity into total intangible assets and the remaining book value balance.

$$MVE_{i,t} = \alpha_0 + \alpha_1 BVExTIA_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 TIA_{i,t} + \alpha_4 SIZE_{i,t} + \alpha_5 INVOPP_{i,t} + \alpha_6 ECON_t + \varepsilon_{i,t} \quad (2)$$

Model (3) further disaggregates the total intangible assets into identifiable and unidentifiable intangible assets, the latter of which is goodwill.

$$MVE_{i,t} = \alpha_0 + \alpha_1 BVExTIA_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 IIA_{i,t} + \alpha_4 GW_{i,t} + \alpha_5 SIZE_{i,t} + \alpha_6 INVOPP_{i,t} + \alpha_7 ECON_t + \varepsilon_{i,t} \quad (3)$$

Models (4) to (6) decompose goodwill into goodwill acquired in different periods.

$$MVE_{i,t} = \alpha_0 + \alpha_1 BVExTIA_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 IIA_{i,t} + \alpha_4 GWA0_{i,t} + \alpha_5 GWxA0_{i,t} + \alpha_6 SIZE_{i,t} + \alpha_7 INVOPP_{i,t} + \alpha_8 ECON_t + \varepsilon_{i,t} \quad (4)$$

$$MVE_{i,t} = \alpha_0 + \alpha_1 BVExTIA_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 IIA_{i,t} + \alpha_4 GWA0_{i,t} + \alpha_5 GWA\text{-}1_{i,t} + \alpha_6 GWxA0\text{-}1_{i,t} + \alpha_7 SIZE_{i,t} + \alpha_8 INVOPP_{i,t} + \alpha_9 ECON_t + \varepsilon_{i,t} \quad (5)$$

$$MVE_{i,t} = \alpha_0 + \alpha_1 BVExTIA_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 IIA_{i,t} + \alpha_4 GWA0_{i,t} + \alpha_5 GWA\text{-}1_{i,t} + \alpha_6 GWA\text{-}2_{i,t} + \alpha_7 GWxA0\text{-}2_{i,t} + \alpha_8 SIZE_{i,t} + \alpha_9 INVOPP_{i,t} + \alpha_{10} ECON_t + \varepsilon_{i,t} \quad (6)$$

All variables are described in Table 1 below.

Table 1: Description of the variables

Variable	Description
MVE	Market value of equity of firm-year observation *i* at year *t*, measured by share price three months after the year-end date when information from financial statements of listed firms is made public.
BVE	Book value of equity, or net assets (total assets net of total liabilities) of firm *i* at year *t*.
NI	Net income of firm *i* at year *t*.
BVExTIA	Book value of equity excluding the total intangible assets of firm *i* at year *t*.
TIA	Total intangible assets of firm *i* at year *t*.
IIA	Identifiable intangible assets (net of accumulated amortisation) of firm *i* at year *t*.
GW	Goodwill (net of accumulated goodwill impairment).
GWA0	Goodwill acquired in the current year *t*
GWA-1	Goodwill acquired in the previous year *t−1*
GWA-2	Goodwill acquired in the previous two years *t−2*
GWxA0	The remaining goodwill balance excluding goodwill acquired in the current year of firm *i* at year *t*.
GWxA0-1	The remaining goodwill balance excluding goodwill acquired in the current year and the previous year of firm *i* at year *t*.
GWxA0-2	The remaining goodwill balance excluding goodwill acquired in the current year and the previous two years of firm *i* at year *t*.
SIZE	The natural log of the total assets of firm *i* at year *t*.
INVOPP	Investment opportunity, measured by market-to-book ratio of firm *i* at year *t*.
ECON	Future economic environment forecasted by investors in year *t*, measured by growth in gross domestic product (GDP) in year *t+1*.
ε	Error term

To ensure that all accounting information at the end of year *t* is available to the public and known by investors, the dependent variable *MVE* is measured by the share price of the firm-year observation *i* at time *t*, which is the final date of the first quarter of year *t+1*. Every variable is on a per-share basis, with the exception of three control variables.

All independent variables are expected to positively determine the firm's market value. The disaggregated assets are each expected to generate future cash flows or economic benefits for the acquirer (Jennings et al., 1996). Identifiable intangible assets, such as computer software, patents, leasehold rights and other intellectual property rights, have increased rapidly in the new age of the digital economy. They raise the total factor productivity of firms, which consequently increases their market value (Lev, 2004). The amount of purchased goodwill (acquired in any period) is recognised as an asset with the potential to generate future economic benefits as explained by either the super profit, momentum, core goodwill or the unidentifiable intangible asset theory. A positive relationship between the amount of purchased goodwill and a firm's market value is expected. Moreover, high net income corresponds to high profitability, which raises dividend payments and stock prices (McCarthy & Schneider, 1995).

The first control variable is *SIZE*. Large firms, measured by their size of total assets, are expected to positively affect market value because they can better generate sales, reduce costs and become more profitable than small firms. Cost savings are a result of economies of scale and scope. Large firms benefit from economies of scale by gaining bargaining power in raw material sourcing (Asimakopoulos et al., 2009), the ability to attract and retain quality personnel (Bryson et al., 2021) and the ability to obtain external funding at a lower cost (Alarussi & Alhaderi, 2018). Large firms with economies of scope can cut costs by sharing resources and production know–how while producing multiple products (Gharaibeh & Khaled, 2020). Regarding sales and profitability, large firms are likely to boost sales and profits by exercising market power over product prices. Furthermore, investors perceive large firms as having the ability to absorb market risk (Bhattacharyya & Saxena, 2009) and gain access to advanced technology (Gharaibeh & Khaled, 2020), resulting in high expected future cash flows and stock prices. Finally, large firms tend to provide more useful information for forecasting their future business position and do so more swiftly than small firms (Badu & Appiah, 2018).

The second control variable is *INVOPP* denoting investment opportunity. It is measured by a firm's market-to-book ratio and is

expected to positively determine a firm's market value because firms with high discretionary investment opportunities have excellent growth prospects and less debt in their capital structure, leading investors to expect higher market value than firms that rely solely on assets already in place (Kallapur & Trombley, 2001). In empirical research, the market-to-book ratio is commonly used as a proxy for investment opportunity to reflect firms' success in delivering strong operating performance and net asset growth (Sharma et al., 2013).

The third control variable is *ECON*, which represents the investor's expectation of the future economic environment in year *t*. We use GDP growth in year *t+1* as a proxy for the predicted economic conditions. Jenkins et al. (2009) and Dunham and Grandstaff (2021) find that economic conditions influence stock prices. Because the stock market is forward-looking, the effect of economic conditions on stock prices is usually not concurrent, but rather precedes the economic cycle. Therefore, we hypothesise that future economic growth influences market value or stock prices.

We perform three tests to select the optimal estimation model. First, we use the Chow test (F-test) to determine whether the fixed effect model outperforms the OLS model. Second, we use the Breusch-Pagan test (LM test) to determine whether the random effect model is superior to the OLS model. Finally, we employ the Hausman test to decide which between the fixed effect or random effect model is the best model.

All goodwill value relevance estimation models are estimated using sample data from the top 100 listed firms on the Stock Exchange of Thailand (SET) from 2008 to 2019. In 2008, Thailand's goodwill accounting standard was changed from amortisation to an impairment-only approach, and 2019 was the preceding year to the COVID-19 pandemic, which curtailed almost all global economic activities in the following years. Our study excludes financial firms because their capital structure and regulations differ from those of other industries. Furthermore, to focus on the value relevance of goodwill, we only include firms with at least one year of positive goodwill in their balance sheets. Negative goodwill is not included in our study because according to the current accounting standard, it is now recorded as a gain from bargain purchase in the income statement in the acquisition period. As a result, the original 100 sample firms are reduced to 56 firms in 13 industries. These firms invested in either domestic or cross-border M&As or both. Among them, three firms disclose their annual financial information on a different year-end date, March 31, rather than December 31. These firms are excluded because

we evaluate the impact of accounting and financial information on firm market value by observing equity investors' responses to stock prices on March 31, three months after the normal financial year-end of December 31. Finally, the number of firms in our study is reduced to 53, with 488 firm-year observations. Table 2 shows the distribution of total observations and the proportion of goodwill in total assets by industry.

Table 2: Number of firm-year observations and goodwill to total assets in the full sample

Industry	Firm-year observations		Goodwill to total
	Number	Percentage (%)	assets (%)
Agribusiness	24	4.92	0.70
Commerce	35	7.17	14.42
Construction Materials	24	4.92	1.37
Electronic Components	12	2.46	0.51
Energy & Utilities	151	30.94	2.20
Food and Beverage	46	9.43	7.89
Health Care Services	43	8.81	4.42
Information & Communication Technology	48	9.84	1.65
Media & Publishing	17	3.48	1.42
Petrochemicals & Chemicals	18	3.69	2.31
Property Development	47	9.63	2.63
Tourism & Leisure	12	2.46	1.07
Transportation & Logistics	11	2.25	14.08
Total	488	100.00	3.86

The energy industry has the most observations (31 per cent), followed by the information and communication technology industry (10 per cent), property development (10 per cent), food and beverage (9 per cent) and healthcare (9 per cent). However, the industries with the highest proportion of goodwill as a percentage of total assets are commerce (14 per cent), transportation and logistics (14 per cent) and food and beverage (8 per cent). In contrast, agribusiness, electronic components, tourism and leisure, media and publishing, and construction materials have the lowest percentages.

Not goodwill in all industries is value relevant, particularly not in the ones with very small goodwill to total assets. In fact, Bepari and Mollik (2017), Bugeja and Gallery (2006), Godfrey and Koh (2001), and Oliveira et al. (2010) all show that the relative size of all types of assets has an effect on their value relevance.

4. Results and Discussion

4.1. Descriptive statistics

Table 3 provides the descriptive statistics of all variables in Models (1) to (6). The mean of stock price or *MVE* is approximately 43.50. Although *MVE* has the highest standard deviation, its coefficient of variation, which is about 1.7, is comparable to the coefficients of the other variables. Moreover, the minimum of *BVE* is greater than zero, but the minimum of *BVE*TIA* is negative, indicating that some firms have a large amount of total intangible assets. In fact, the total intangible assets grew much more rapidly than tangible assets (property, plant and equipment or PPE), with goodwill balance growing at a rate almost twice the growth rate of the identifiable intangible assets. However, the mean of *GW* is still lower than the mean of *IIA*. Among the control variables, the dispersion of firm size is significantly lower than that of the market-to-book ratio (representing *INVOPP*) and GDP growth (representing *ECON*). Particularly, the leading GDP growth ranges from a low of 6.1 per cent negative growth in 2020 to a high of 7.8 per cent in 2010.

Table 3: Descriptive statistics of the variables in the full sample

Variable	Mean	Std Dev	Minimum	Maximum
MVE	43.50	75.23	0.04	540.00
BVE	21.16	37.77	0.02	273.12
NI	3.26	6.56	−7.96	58.93
BVExTIA	16.13	33.87	−25.83	239.00
TIA	5.03	9.53	0.00	46.93
IIA	3.01	6.42	0.00	40.19
GW	2.01	5.18	0.00	39.51
GWA0	0.38	2.27	0.00	38.96
GWA-1	0.31	2.11	0.00	38.90
GWA-2	0.29	2.09	0.00	38.83
GWxA0	1.63	4.56	0.00	39.44
GWxA0-1	1.33	4.01	0.00	39.37
GWxA0-2	1.05	3.38	0.00	39.33
SIZE	10.89	1.49	6.41	14.73
INVOPP	3.23	3.01	0.18	23.03
ECON	2.10	3.73	−6.10	7.80

Note: All variables except for the three control variables are in Thai Baht. *SIZE* is in the log of the amount in Thai Baht. *INVOPP* is in ratio. *ECON* is in percentage.

Table 4 shows the matrix of the Pearson correlation coefficients between the variables in Model (6). The correlations between *MVE* with *BVExTIA* and *NI* are higher than those between all intangible assets. Overall, the correlation among the explanatory variables in each of our regression models is low, with the mean of variance inflation factor (VIF) about 2.0. Appendix A shows that only coefficients of variables related to *BVE* and *NI* have VIF estimates of 5.3, whereas all the rest, including goodwill variables by age, range from 1.0 to 1.5.

Table 4: Pearson correlation matrix of variables in Model (6) in the full sample

	MVE	***BVExTIA***	***NI***	***IIA***	***GWA0***	***GWA-1***
MVE	1					
BVExTIA	0.784***	1				
NI	0.879***	0.872***	1			
IIA	0.347***	0.159***	0.298***	1		
GWA0	0.157***	0.146***	0.169***	0.146***	1	
GWA-1	0.117***	0.079*	0.098**	0.126***	0.015	1
GWA-2	0.091**	0.077*	0.083*	0.120***	0.028	0.004
GWxA0-2	0.282***	0.343***	0.320***	0.291***	0.045	0.020
INVOPP	0.138***	−0.182***	0.010	0.060	−0.028	−0.016
ECON	0.052	−0.012	0.023	−0.018	−0.036	0.025

	GWA-2	***GWxA0-2***	***INVOPP***	***ECON***
MVE				
BVExTIA				
NI				
IIA				
GWA0				
GWA-1				
GWA-2	1			
GWxA0-2	0.019	1		
INVOPP	−0.041	−0.098**	1	
ECON	0.003	−0.096**	0.055	1

Note: ***, ** and * indicate significance level at 1%, 5% and 10%, respectively

4.2. *Estimated results*

Table 5 shows the fixed effect estimation results of the goodwill balance figures on the market value of acquiring firms based on Models (1) to (6). Models (1) and (2) display the estimated results of the modified Ohlson (1995) model. Meanwhile, Model (3) examines the effect of goodwill relative to other types of assets on the market value, whereas Models (4) to (6) highlight the value relevance of goodwill of different ages.

Our overall findings support the predicted effects of most basic variables in the Ohlson (1995) model. Except for goodwill, both the total book value of equity disaggregated by type of assets and net income have a significantly positive impact on acquiring firms' market value. As predicted by the hypotheses, all three control variables significantly and positively affect stock prices. Detailed findings from Models (1) to (6) are in Table 5.

Table 5: Estimated results of the full sample

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
BVE	0.5844***					
NI	6.0492*** (11.92)	6.0977*** (11.81)	5.9405*** (11.49)	5.9439*** (11.47)	5.9383*** (11.46)	5.9339*** (11.44)
BVExTIA		0.5647*** (5.73)	0.6198*** (6.17)	0.6188*** (6.14)	0.6260*** (6.20)	0.6314*** (6.22)
TIA		0.6707*** (3.55)				
IIA			1.1562*** (4.27)	1.1548*** (4.26)	1.1659*** (4.30)	1.1731*** (4.30)
GW			−0.0915 (−0.26)			
GWA0				−0.1872 (−0.29)	−0.1949 (−0.30)	−0.2021 (−0.31)
GWA-1					0.4931 (0.71)	0.4939 (0.71)
GWA-2						0.0977 (0.14)
GWxA0				−0.0637 (−0.16)		
GWxA0-1					−0.2657 (−0.61)	

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
GWxA0-2						−0.4177 (−0.82)
SIZE	5.9690*** (4.82)	5.7359*** (4.36)	5.8032*** (4.43)	5.8033*** (4.43)	5.8015*** (4.42)	5.7886*** (4.41)
INVOPP	4.4496*** (7.85)	4.4156*** (7.73)	4.1932*** (7.29)	4.1952*** (7.29)	4.1772*** (7.25)	4.1783*** (7.25)
ECON	0.7558** (1.99)	0.7584** (2.00)	0.7341* (1.95)	0.7333* (1.94)	0.7119* (1.88)	0.6975* (1.84)
Intercept	−69.4979*** (−5.12)	−67.1297*** (−4.68)	−67.4002*** (−4.73)	−67.4057*** (−4.72)	−67.3160*** (−4.72)	−67.1836*** (−4.70)
Estimation Model	Fixed effect	Fixed effect	Fixed effect	Fixed effect	Fixed effect	Fixed effect
R-Squared	0.8097	0.8095	0.8114	0.8114	0.8120	0.8124
F-stat	319.03***	265.49***	230.99***	201.70***	179.40***	161.28***

Note: ***, ** and * indicate significance level at 1%, 5% and 10%, respectively.

The estimated results of Model (1) demonstrate that investors place a high value on the financial statement disclosures of *BVE* and *NI*. They perceive that a high *BVE* will likely result in large future cash flows and high *NI* produces large dividend payments, both of which lead to high share prices. In Model (2), when *TIA* is separated from *BVE*, investors attach greater value to *TIA* than to *BVExTIA*, indicating the growing recognition of intangible assets as earnings-generating assets. Evidently, the findings are supported in Table 6. The share of PPE in total assets (PPE/TA) decreased from 2008 to 2019, whereas the share of total intangible assets (TIA/TA) increased. In particular, the rising TIA/TA is consistent with the trends in developed countries and emerging markets with rapidly advanced digital technology (Horn & Ohl, 2021).

Table 6: Average percentage share of total assets by asset type of full sample (Unit: %)

Year	PPE/TA	TIA/TA	IIA/TA	GW/TA	RMNG/TA
2008	43.66	4.91	3.43	1.48	51.43
2009	45.37	5.14	3.42	1.72	49.48
2010	40.19	7.36	5.26	2.09	52.46
2011	40.57	8.70	6.34	2.36	50.73
2012	39.18	11.77	7.91	3.85	49.06
2013	37.89	11.38	6.90	4.49	50.73

Year	PPE/TA	TIA/TA	IIA/TA	GW/TA	RMNG/TA
2014	39.21	10.99	6.78	4.21	49.80
2015	41.09	11.13	6.90	4.22	47.78
2016	40.44	12.07	7.16	4.91	47.48
2017	40.38	11.13	6.37	4.76	48.49
2018	40.23	11.74	7.07	4.67	48.03
2019	41.13	11.46	6.60	4.86	47.41
Total	40.66	10.19	6.33	3.86	49.15
Growth	−0.50	7.32	5.61	10.43	−0.68

Note: PPE denotes property, plant and equipment; TIA total intangible assets (the sum of IIA and GW); IIA identifiable intangible assets; GW amount of goodwill; RMNG the rest of the total assets; and TA total assets. The growth is compound annual growth rate.
Source: Computed by the authors using balance sheet data from the SET.

When *TIA* is further decomposed into *IIA* and *GW*, Model (3) show that *IIA* has a significantly positive effect on stock prices. In contrast, the effect of all goodwill-related variables is insignificant because the amount of goodwill remains small in comparison to other major assets. As shown in Table 6, on the average of all firm-years, GW/TA was the smallest at only 3.86 per cent. The finding on the effect of goodwill size on its value relevance complements Bepari and Mollik (2017), Bugeja and Gallery (2006), Godfrey and Koh (2001), and Oliveira et al. (2010): if the relative size of any kind of asset in total assets is small, it is likely that it will not be value relevant. Thus, it motivates us to further investigate the effect of goodwill balance on the market value of a subsample by focusing only on firm-year observations with relatively large amounts of goodwill.

By defining relatively large goodwill as the observations with above-average GW/TA (3.86 per cent) in the subsample, the number of firm-years available for our study is reduced to 134 observations from 22 firms in 10 industries, and the new average percentage of GW/TA is raised to 12.22 per cent. The subsample data exclude observations from three industries: electronic components, media and publishing, and tourism and leisure in the full sample. The GW/TA, IIA/TA and stock prices of the excluded observations are all lower than the full sample averages (see Table 2). Based on the smaller subsample of the relatively large GW/TA, the PPE/TA is reduced from the original 40.66 per cent to 37.97 per cent. The remaining total assets (RMNG/TA) are also reduced from 49.15 per cent to 40.31 per cent. However, the IIA/TA increased from 6.33 per cent to 9.51 per cent. Despite such an increase, the IIA/TA is now lower than the 12.22 per cent of GW/TA (see Table 7).

Table 7: Average percentage share of total assets by asset type of subsample (Unit: %)

Year	PPE/TA	TIA/TA	IIA/TA	GW/TA	RMNG/TA
2008	59.74	11.61	3.59	8.01	28.66
2009	58.49	13.34	4.20	9.15	28.17
2010	46.58	17.13	8.20	8.94	36.28
2011	43.29	20.47	10.38	10.09	36.23
2012	36.88	22.47	12.54	9.93	40.65
2013	36.52	23.42	11.49	11.92	40.06
2014	34.47	22.65	11.88	10.77	42.87
2015	35.39	23.25	11.13	12.11	41.36
2016	34.76	25.73	9.93	15.80	39.50
2017	34.91	22.83	8.44	14.39	42.27
2018	34.60	21.77	7.82	13.95	43.64
2019	38.11	20.30	7.56	12.74	41.59
Total	37.97	21.72	9.51	12.22	40.31
Growth	−3.68	4.77	6.40	3.94	3.15

Note: See the note of Table 6.

We begin by examining the value relevance of goodwill balance using the subsample of 134 firm-year observations with relatively large goodwill balance to total assets. We find that the total aggregated goodwill balance and goodwill classified by age have significantly positive effects on stock prices. All explanatory variables, including control variables, exhibit the anticipated positive effects. However, the positive effects of two explanatory variables, that is, identifiable intangible assets and the control variable of acquiring firms' size, are no longer statistically significant (results untabulated). This stems from excluding observations from the three industries with below-average goodwill to total assets. Such exclusion renders the effect of firm size on stock prices insignificant in the subsample, as the firm size of the deleted observations is highly correlated with the corresponding stock prices. Consequently, we later remove firm size as a control variable in the new models and display the estimated results of Models (1) to (6) in Table 8.

Table 8 presents the new findings with VIF estimates shown in Appendix B. The estimates range from 1.0 to 4.7 with the mean value of 1.9, indicating that the multicollinearity problem is not a concern. After controlling for the effects of the potential growth of

the acquiring firms and the economy as a whole, we find that all types of assets, including goodwill of all ages and net income, have significantly positive effects on stock prices. The goodwill balance is more value relevant than all other major assets when it is high relative to the total assets. As shown in Table 6, the PPE/TA was declining throughout 2008-2019, whereas the TIA/TA were rising. However, when disaggregating TIA into IIA and GW, we determine that the GW/TA is greater than that of IIA/TA by almost 30 per cent, indicating that the size of goodwill relative to other assets matters in assessing value relevance. As the size of goodwill increases, so does its value relevance.

Table 8: Estimated results of the subsample excluding firm size in the models

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
BVE	0.9089*** (14.05)					
NI	2.7801*** (6.33)	2.6812*** (5.16)	2.3748*** (3.89)	2.3773*** (3.90)	2.3134*** (3.85)	2.3413*** (3.97)
BVExTIA		0.9172*** (9.89)	0.9535*** (10.25)	0.9530*** (10.24)	0.9593*** (10.85)	0.9526*** (10.65)
TIA		0.8743*** (7.09)				
IIA			0.4855** (2.17)	0.4851** (2.16)	0.4692** (2.07)	0.4571** (1.99)
GW			1.2886*** (8.05)			
GWA0				1.2521*** (5.95)	1.2589*** (5.97)	1.2671*** (6.00)
GWA-1					1.3599*** (5.47)	1.3581*** (5.50)
GWA-2						1.2951*** (6.18)
GWxA0				1.2991*** (6.57)		
GWxA0-1					1.3318*** (5.27)	
GWxA0-2						1.3989*** (3.89)
INVOPP	2.8126*** (5.33)	3.5530** (2.45)	3.4081** (2.42)	3.4090** (2.41)	3.4017** (2.40)	3.3870** (2.40)

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
ECON	0.8358** (2.32)	0.6604* (1.69)	0.7595** (2.01)	0.7580** (2.00)	0.7700** (2.01)	0.8213** (2.09)
Intercept	−4.7668** (−1.99)	−5.9159* (−1.67)	−5.8030* (−1.70)	−5.8097* (−1.69)	−5.8473* (−1.69)	−5.9958* (−1.74)
Estimation Model	Fixed Effect	OLS	OLS	OLS	OLS	OLS
R-Squared	0.9168	0.9184	0.9225	0.9225	0.9236	0.9244
F-stat	287.38***	N/A	N/A	N/A	N/A	N/A

Note: ***, ** and * indicate significance level at 1%, 5% and 10%, respectively.

4.3. Discussion

Based on the full sample of all firm-years, goodwill of all ages has no significant effect on market value. However, goodwill is value relevant in the subsample of firm-years with relatively large amount. Moreover, investors value goodwill more than identifiable intangible assets, although both are increasingly useful for firms to boost their total factor productivity as the economy develops. In the full sample, IIA/TA grows more slowly than GW/TA. Similarly, in the subsample, the IIA/TA is even smaller than GW/TA. This is because the amount of identifiable intangible assets is typically under-recorded and subsumed into goodwill following a business combination. Investment in intangibles, such as R&D, brand name, customer and supplier relationship, product and process upgrading and human capital management, are recorded as expenses in the income statement rather than assets in the balance sheet, resulting in not all intangible assets being identified (Horn & Ohl, 2021; Ji & Lu, 2014; Lev, 2004). However, if capitalised, the above investment represents internally-generated intangible assets. They would become internally-generated goodwill recognised as an unidentifiable intangible asset if purchased by another firm alongside the target's other assets. They would not be recorded as identifiable intangible assets if they were not purchased, simply because they cannot be traded in the market as a standalone asset. Therefore, our findings are consistent with Dahmash et al. (2009), Godfrey and Koh (2001), Ji and Lou (2014), Kimouche and Rouabhi (2016) and Shahwan (2004), demonstrating that goodwill can potentially generate future cash flows and has a greater effect on the market value of firms than identifiable intangible assets.

On how different the value relevance of goodwill is across periods, the estimated results of Models (4) to (6) show that

goodwill has a significantly positive effect on the firm's market value regardless of when it is acquired. Nonetheless, the slope coefficients of our focused goodwill variables show that goodwill acquired in the current year has less effect than goodwill acquired in previous periods. The results differ from Bugeja and Gallery (2006) regarding how under the old goodwill amortisation accounting standard, goodwill is value relevant only within a few years after business combination. In contrast, our results are consistent with Bepari and Mollik (2017) and Omarjee et al. (2019), which show that the value relevance of goodwill is lengthy under the current goodwill impairment approach. Goodwill of all ages except for the currently acquired one is value relevant. Investors appear to perceive that goodwill takes time to generate future economic benefits. The amount of goodwill in the acquisition year has little impact owing to investors' perception that information on current period goodwill is provisional. In fact, within a year after the acquisition date, the provisional amount must be adjusted to reflect new information about facts and circumstances that would have affected the amount of goodwill at that date. Furthermore, some information, such as unrecorded pre-acquisition goodwill of acquiring firms or latent benefits of the M&As, may be omitted in the acquisition price (Jennings et al., 1996). Therefore, investors may question the credibility of goodwill information in the acquisition year. However, since the amount must be reassessed to reflect the most updated information a year after the acquisition, investors perceive that goodwill is the amount representing the expected future economic benefits as time passes.

Importantly, according to Thailand's currently adopted impairment-only accounting standard, goodwill requires annual testing for impairment losses. The finding that goodwill does not diminish with age is basically because goodwill impairment charges are uncommon and only apply to a small number of firms. Only 12 per cent and 15 per cent of total firm-year observations in the full sample and subsample show goodwill impairment losses. Thus, to further verify the robustness of our results, we separate goodwill impairment losses from net income and include them as an additional explanatory variable in our estimation model. The results show that its effect on market value, while negative, is not statistically significant. In contrast, the coefficients of the remaining explanatory variables are close to those of the original model (results untabulated). Therefore, goodwill impairment losses have little impact on the market value of acquirers. In contrast, requiring

the amount of goodwill to be regularly tested for impairment losses allows investors to have a firmer view after the acquisition completion rather than the acquisition date when the goodwill amount has not yet been adjusted. Finally, based on samples with a high proportion of goodwill to total assets, the value relevance of goodwill does not decline as it ages. In fact, older goodwill is more value relevant than newly acquired goodwill. Because of the impairment charges requirement, information on older goodwill with little impairment charges is more credible than information on goodwill disclosed in the acquisition year. The above results are consistent with many studies linking impairment losses to acquirers' market value. For example, Bepari and Mollik (2017) and Li and Taylor (2018) show that if goodwill impairment losses were written off against net income infrequently and in small amounts, there would be little adverse effect of impairment charges on the market value of acquiring firms, implying that the value relevance of goodwill could last over time.

5. Conclusion and Implications

Our study examines the value relevance of the goodwill balance recorded in the financial statements of acquiring firms in the context of Thailand. We modify Ohlson (1995) accounting-based valuation model to determine the effects of the goodwill balance of different sizes and its disaggregation by the acquisition period on the market value, represented by stock prices, of acquiring firms to establish the value relevance of total goodwill and goodwill by age and size. Based on the full sample of nonfinancial acquiring firms listed in the SET100 across 2008-2019, the amount of goodwill at any age has no significant, albeit positive, impact on stock prices. There is no evidence regarding the value relevance of goodwill because, despite the amount of goodwill increasing more rapidly than other types of assets, its amount in total assets is still smaller than that of other types. Evidence on the effect of asset size on the value relevance by Bepari and Mollik (2017), Bugeja and Gallery (2006), Godfrey and Koh (2001), and Oliveira et al. (2010) on the effect of the size of goodwill compels us to further investigate the value relevance of goodwill when the amount is sufficiently large. To determine the effects of goodwill on the corresponding stock prices, we then examine the subsample of firm-years in which the ratio of goodwill value to total assets is greater than the full sample average. The results contrast the previous findings. After controlling for investment opportunities and the overall macroeconomic conditions, we determine that both the

total amount of goodwill and goodwill by age have value relevance. That is, the size of goodwill matters for value relevance just as goodwill of all ages.

Overall, the value relevance of goodwill will increase if the recorded amount continues to grow in Thailand. Currently, the average amount of goodwill across all firms remains small relative to their total assets, and there is no evidence that it is value relevant. However, since the amount of goodwill is increasing faster than other assets, our results suggest that as the amount of goodwill grows, its value relevance will become apparent compared to the remaining assets. Additionally, although goodwill of all ages has value relevance, goodwill acquired in the current period has a smaller impact on the stock prices of acquiring firms than goodwill acquired in previous periods. The value relevance of aged goodwill is not significantly different from one another. Investors do not perceive that goodwill ceases to provide expected synergies and exceptional economic benefits within a few years after the date of acquisition because goodwill impairment adjustment is infrequent and impairment losses are not substantial. Evidently, as time progresses and the size of goodwill grows, the amount disclosed in the financial statement will become increasingly useful for investors to evaluate acquiring firms' future economic benefits, thereby increasing the firm's market value.

In a digital era, goodwill and identifiable intangible assets are an increasingly crucial source of productivity growth (Bagna et al., 2024; Miyagawa & Hisa, 2013; van Ark et al., 2009) and the market value of acquiring firms (Aboody & Lev, 1998; Kimouche & Rouabhi, 2016). With our conclusion, it is all the more apparent that goodwill is perceived as an asset that can potentially generate future earnings following the business combination. The results lead to several implications. Firstly, when an acquiring firm initiates an M&A, the target should be strategically chosen for future benefits to correspond to the highly-paid goodwill. It should target a firm with a good reputation on its product quality that enables the acquirer to gain from an expanded market base and market share. The target should be financially sound so that it can potentially generate profits, maintain a healthy liquidity position, and avoid the risk of solvency. Ultimately, the acquirer should select a target with managerial and technological capabilities to benefit from the management's expertise in doing business and its ability to equip its workforce with up-to-date technology to enhance the combined firm's future total factor productivity. Secondly, accounting standard setters and regulators

should attach importance to providing timely and high-quality accounting and financial information to the public because investors use it to make well-informed decisions on their portfolio choice. Finally, the government should provide a conducive environment for the acquiring and target firms to develop innovative activities and a creative workforce to upgrade their production and management capabilities and boost synergies following a business combination. The policy will increase the gain from M&A investment, which will eventually result in the growth of the economy.

Taken together, although our study contributes to the extant empirical literature on the value relevance of goodwill in emerging markets, particularly in Thailand, there remains room for future improvement. We recommend that further research consider relaxing the assumption on market efficiency, using alternative estimation models or updating the database to examine whether our results can be generalized to countries with different levels of capital market and economic developments.

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Appendix A: VIF for coefficients in the full sample in Table 5

Variable	VIF
NI	5.37
BVExTIA	5.33
IIA	1.45
GWA0	1.05
GWA-1	1.03
GWA-2	1.03
GWxA0-2	1.26
SIZE	1.53
INVOPP	1.24
ECON	1.02
Mean	2.03

Appendix B: VIF for coefficients in the subsample in Table 8

Variable	VIF
NI	4.76
BVExTIA	4.70
IIA	1.24
GWA0	1.09
GWA-1	1.06
GWA-2	1.04
GWxA0-2	1.38
INVOPP	1.10
ECON	1.07
Mean	1.94

References

Aboody, D., & Lev, B. (1998). The Value Relevance of Intangibles: The Case of Software Capitalization. *Journal of Accounting Research*, *36*, 161-191. https://doi.org/10.2307/2491312

Acaranupong, K. (2021). International Financial Reporting Standards Convergence and Value Relevance of Accounting Information: Evidence from ASEAN. *Asian Journal of Business and Accounting*, *14*(2), 31-68. https://doi.org/10.22452/ajba.vol14no2.2

Al Jifri, K., & Citron, D. (2009). The Value-Relevance of Financial Statement Recognition versus Note Disclosure: Evidence from Goodwill Accounting. *European Accounting Review*, *18*(1), 123-140. https://doi.org/10.1080/09638180802324351

Alarussi, A.S., & Alhaderi, S.M. (2018). Factors affecting profitability in Malaysia. *Journal of Economic Studies*, *45*(3), 442-458. https://doi.org/:10.1108/JES-05-2017-0124

Asimakopoulos, I., Samitas, A., & Papadogonas, T. (2009). Firm-specific and economy wide determinants of firm profitability: Greek evidence using panel data. *Managerial Finance*, *35*(11), 930-939. https://doi.org/:10.1108/03074350910993818

Badu, B., & Appiah, K.O. (2018). Value relevance of accounting information: an emerging country perspective. *Journal of Accounting & Organizational Change*, *14*(4), 473-491. https://doi.org/:10.1108/JAOC-07-2017-0064

Bagna, E., Ramusino, E.C., Denicolai, S., & Strange, R. (2024). Intangible assets and firm performance: The relative effects of recognized and unrecognized assets. *Journal of Open Innovation: Technology, Market, and Complexity*, *10*(3). https://doi.org/10.1016/j.joitmc.2024.100356

Barth, M.E., & Clinch, G. (1996). International Accounting Differences and Their Relation to Share Prices: Evidence from U.K., Australian, and Canadian Firms. *Contemporary Accounting Research*, *13*(1), 135-170. https://doi.org/:10.1111/j.1911-3846.1996.tb00495.x

Bepari, M.K., & Mollik, A.T. (2017). Regime change in the accounting for goodwill: Goodwill write-offs and the value relevance of older goodwill. *International Journal of Accounting and Information Management*, *25*(1), 43-69. https://doi.org/:10.1108/IJAIM-02-2016-0018

Bhattacharyya, S., & Saxena, A. (2009). Does the Firm Size Matter? An Empirical Enquiry into the Performance of Indian Manufacturing Firms. [MPRA paper]. *University Library of Munich*. https://econpapers.repec.org/RePEc:pra:mprapa:13029.

Bloom, M. (2008). *Double Accounting for Goodwill: A Problem Redefined*. Routledge.

Bryson, A., Erhel, C., & Salibekyan, Z. (2021). Perceptions of non-pecuniary job quality using linked employer–employee data. *European Journal of Industrial Relations*, *27*(2), 113-129. https://doi.org/:10.1177/0959680119884753

Bugeja, M., & Gallery, N. (2006). Is older goodwill value relevant? *Accounting & Finance*, *46*(4), 519–535. https://doi.org/:10.1111/j.1467-629X.2006.00181.x

Chauvin, K.W., & Hirschey, M. (1994). Goodwill, profitability, and the market value of the firm. *Journal of Accounting & Public Policy*, *13*(2), 159-180. https://doi.org/:10.1016/0278-4254(94)90018-3

Dahmash, F.N., Durand, R.B., & Watson, J. (2009). The value relevance and reliability of reported goodwill and identifiable intangible assets. *British Accounting Review*, *41*(2), 120-137. https://doi.org/:10.1016/j.bar.2009.03.002

Daorueng, A., Akarak, P., & Yeungyong, W. (2020). The relationship between intangible assets, cash flow, and firm performance on stock price of listed companies in the stock exchange of Thailand. *Graduate School Journal Chiang Rai Rajaphat University*, *13*(1), 45-65. [in Thai].

Dunham, L.M., & Grandstaff, J.L. (2022). The Value Relevance of Earnings, Book Values, and Other Accounting Information and the Role of Economic Conditions in Value Relevance: A Literature Review. *Accounting Perspectives*, *21*(2), 237-272. https://doi.org/:10.1111/1911-3838.12280

Eloff, A.M., & de Villiers, C. (2015). The value-relevance of goodwill reported under IFRS 3 versus IAS 22. *South African Journal of Accounting Research*, *29*(2), 162-176. http://doi.org/10.1080/10291954.2015.1006485

Fama, E.F. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. *Journal of Finance*, *25*(2), 383-417. https://doi.org/10.2307/2325486

Gharaibeh, O., & Khaled, M. (2020). Determinants of profitability in Jordanian services companies. *Investment Management and Financial Innovations*, *17*(1), 277-290. https://doi.org/:10.21511/imfi.17(1).2020.24

Godfrey, J., & Koh, P.S. (2001). The Relevance to Firm Valuation of Capitalising Intangible Assets in Total and by Category. *Australian Accounting Review*, *11*(25), 39-48. https://doi.org/:10.1111/j.1835-2561.2001.tb00186.x

Horn, H., & Ohl, A. (2021). The unbalanced balance sheet: Making intangibles count. PricewaterhouseCoopers. https://viewpoint.pwc.com/content/dam/pwc-madison/ditaroot/us/en/pwc/points_of_view/assets/povmarketcapvsbook.pdf

Institute for Mergers, Acquisitions and Alliances. (2019). M&A statistics. https://imaa-institute.org/mergers-and-acquisitions-statistics/

Jennings, R., Robinson, J., Thompson, R.B., & Duvall, L. (1996). The Relation between Accounting Goodwill Numbers and Equity Values. *Journal of Business Finance & Accounting*, *23*(4), 513-533. https://doi.org/:10.1111/j.1468-5957.1996.tb01024.x

Jenkins, D.S., Kane, G.D., & Velury, U. (2009). Earnings Conservatism and Value Relevance Across the Business Cycle. *Journal of Business Finance & Accounting*, *36*(9–10), 1041-1058. https://doi.org/:10.1111/j.1468-5957.2009.02164.x

Ji, X.D., & Lu, W. (2014). The value relevance and reliability of intangible assets: Evidence from Australia before and after adopting IFRS. *Asian Review of Accounting*, *22*(3), 182-216. https://doi.org/:10.1108/ARA-10-2013-0064

Johnson, L.T., & Petrone, K.R. (1998). Commentary: Is Goodwill an Asset? *Accounting Horizons*, *12*(3), 293-303.

Kallapur, S., & Trombley, M.A. (2001). The investment opportunity set: Determinants, consequences and measurement. *Managerial Finance*, *27*(3), 3-15. https://doi.org/:10.1108/03074350110767060

Kimouche, B., & Rouabhi, A. (2016). The impact of intangibles on the value relevance of accounting information: Evidence from French companies. *Intangible Capital*, *12*(2), 506-529. http://doi.org/10.3926/ic.653

Lev, B. (2004). Sharpening the Intangibles Edge. *Harvard Business Review*, *82*(6), 109-116.

Li, N.S., & Taylor, D.W. (2018). The Value Relevance of Goodwill: IFRSs and Global Financial Crisis (GFC). *International Journal of Accounting and Financial Reporting*, *8*(2), 26-46. https://doi.org/:10.5296/ijafr.v8i2.12830

Lonergan, W. (1995). Goodwill and bad ideas: Fact and fiction in the amortisation debate. *JASSA*, *4*, 2-7.

McCarthy, M.G., & Schneider, D.K. (1995). Market Perception of Goodwill: Some Empirical Evidence. *Accounting and Business Research*, *26*(1), 69-81. https://doi.org/:10.1080/00014788.1995.9729499

Miyagawa, T., & Hisa, S. (2013). Estimates of Intangible Investment by Industry and Productivity Growth in Japan. *The Japanese Economic Review*, *64*(1), 42-72.

Nelson, R.H. (1953). The Momentum Theory of Goodwill. *Accounting Review*, *28*(4), 491-499.

Ohlson, J.A. (1995). Earnings, Book Values, and Dividends in Equity Valuation. *Contemporary Accounting Research*, *11*(2), 661-687. https://doi.org/:10.1111/j.1911-3846.1995.tb00461.x

Oliveira, L., Rodrigues, L.L., & Craig, R. (2010). Intangible assets and value relevance: Evidence from the Portuguese stock exchange. *British Accounting Review*, *42*(4), 241-252. https://doi.org/:10.1016/j.bar.2010.08.001

Omarjee, F.Z., Yasseen, Y., & Mohamed, W. (2019). The Value Relevance of Aged Goodwill: A South African Study. *Southern African Business Review*, *23*(1). https://doi.org/:10.25159/1998-8125/3868

Organisation for Economic Co-operation and Development. (2021). OECD investment policy reviews: Thailand. https://www.oecd.org/countries/thailand/OECD-Investment-Policy-Review-Thailand-Highlights.pdf

Pechlivanidis, E., Ginoglou, D., & Barmpoutis, P. (2022). Debt crisis, age and value relevance of goodwill: Evidence from Greece. *International Journal of Accounting and Information Management*, *30*(2), 189-210. https://doi.org/:10.1108/IJAIM-10-2021-0215

Petersen, C.V. (2006). The Value Relevance of Goodwill and Goodwill Amortization in a Danish Setting. *Corporate Ownership and Control*, *4*(1), 227-241. https://doi.org/:10.22495/cocv4i1c1p5

Poramapojn, P., & Wiboonchutikula, P. (2024). Determinants of goodwill and its impact on post-merger and acquisition performance in Thailand: A firm-level analysis. *Asia-Pacific Journal of Accounting & Economics*, *31*(5), 740-756. https://doi.org/10.1080/16081625.2023.2176328

Rojanarat, W. (2007). *The relationship among intangible assets, stock prices, and future earnings of listed firms in the Stock Exchange of Thailand* [Master's Thesis], Master of Accountancy. Chulalongkorn University. [in Thai].

Sands, J.E. (1963). *Wealth, Income, and Intangibles*. University of Toronto Press.

Shahwan, Y. (2004). The Australian Market Perception Of Goodwill And Identifiable Intangibles. *Journal of Applied Business Research*, *20*(4), 45-64. https://doi.org/:10.19030/jabr.v20i4.2224

Sharma, A., Branch, B., Chgawla, C., & Qiu, L. (2013). Explaining Market-to-Book: The relative impact of firm performance, growth, and risk (pp. 1-32). *Quest of Business*. https://www.westga.edu/~bquest/2013/MarketToBook2013.pdf.

Sukpitak, J., & Hengpunya, V. (2016). Efficiency of Thai stock markets: Detrended fluctuation analysis. *Physica A: Statistical Mechanics and its Applications*, *458*, 204-209. https://doi.org/10.1016/j.physa.2016.03.076

Tangeakchit, M., Jaisattayaban, S., & Laohavisudhi, S. (2019). Value Relevance of Goodwill Obtained from Business Acquisition in Thailand. *Journal of Accountancy and Management*, *11*(4), 116-132. [in Thai].

Van Ark, B., Hao, J. X., Corrado, C., & Hulten, C. (2009). Measuring Intangible Capital and Its Contribution to Economic Growth in Europe. *European Investment Bank Papers*, *14*(1), 62-93.