The Value Relevance of Intangible Assets: Evidence from an Emerging Market Vietnam

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Abstract This study aims to examine the value relevance of intangible assets and their influence on the value relevance of accounting information in Vietnamese-listed non-financial firms. Data used in the study are panel data collected from audited financial statements of 618 non-financial firms from 2015 to 2020. We test three models, including accounting information (earnings per share and book value per share) without intangible assets model, accounting information with intangible assets model, and accounting information with an interaction term of intangible assets model. Fixed-effects analyses show that intangible assets and traditional accounting measures are positively associated with stock prices. The study reveals the value relevance of earnings per share is higher for firms that own intangible assets than for firms that do not. In other words, intangible assets can improve the value relevance of accounting information.

Keywords: • intangible assets • value relevance • accounting information • emerging market • Vietnam

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1 Introduction

The purpose of financial statements is to provide useful information for decision making. Accounting information is considered useful when it shows the faithfulness and the value relevance to the market. The relevance is understood as the ability to capture and summarize information of accounting data, which is reflected in stock prices. From a valuation point of view, the higher the value relevance, the more the investment decision is based on accounting information, and therefore the greater the relationship between accounting information and firm value, the higher the quality of accounting information.

The relationship between accounting information and firm value has been an important research topic. Previous studies indicate that accounting information has a significant influence (value relevance) on firm value (Barton et al., 2010; Dunham & Grandstaff, 2022). However, this influence has declined over the years (Barth et al., 2022). Francis & Schipper (1999) suggested that this phenomenon may be due to the fact that in the context of business activities that have changed continuously over time, accounting activities have been slow to change or accounting activities have changed in the direction providing inappropriate information to the market. Lev & Zarowin (1999) argue that the decrease in the value relevance of accounting information is mainly because the accounting system does not fully reflect the changes in business activities.

Furthermore, in the era of technology and information, now companies actively implementing digital transformation and are starting to pay great attention to the value of intangible assets. Thus, the value of accounting information used in financial statements such as earnings and the book value of equity seems to be reduced. The relevance or usefulness of this financial statement information for the capital market is now limited. In that context, intangible items have changed the production process and business orientation. The economy in recent years has had a strong transition from a manufacturing economy to a service economy and an information economy in many countries. The role of intangible assets is therefore increasingly important and has a strong influence on the performance of the new economy. Consequently, the change in the influence of accounting information on firm value can be attributed to the impact of intangible items.

Intangible assets are considered as strategic assets to enhance the competitiveness of an enterprise and maintain its steady growth. The widespread adoption of new technology has made intangible assets one of the most important factors in the development and success of firms (Córcoles, 2010) and a prominent factor in valuation (Aulia et al., 2020; Çalıyurt, 2021). In developing countries such as Vietnam, intangible assets play a key role in the shift from an agricultural and industrial economy to a service and knowledge economy. The rapid rise of intangible assets raises a question about the role of intangible assets in valuation in these countries. To the extent of our knowledge, a study on the influence of intangible assets on the value relevance of accounting information in Vietnamese enterprises is not available. This paper aims to fill the gap in the literature

concerning the relation between intangible assets and value relevance by using a large sample of non-financial firms listed in Vietnam for a period of 6 years from 2015 to 2020. The purpose of this paper is to investigate whether recognized intangible assets in financial statements are value relevant and whether the assets can improve the value relevance of accounting measures in the Vietnam context.

This study has some contributions to the current literature. First, the study provides comprehensive evidence for explaining the influence of intangible assets on the value relevance in an emerging country like Vietnam, a topic that has not been addressed before. Second, this study is consistent with the point of view that intangible assets play an important role in valuation in the era of technology and information. Third, the evidence presented in this study can be useful in estimating the investments in intangible assets for investors in the Vietnam market. Fourth, the study is useful for policymakers in deciding future regulations regarding the disclosure of intangible assets and how to apply international financial reporting standards (IFRS) in Vietnam.

The remaining part of the paper is organized as follows. In Section 2, previous studies and literature are discussed, and hypotheses are developed. In Section 3, the research methodology and the data source are introduced. In Section 4, the main results and discussions are presented. In Section 5, conclusions are provided.

2 Literature review and hypothesis development

The value relevance of accounting information is mainly related to the valuation function of accounting information. Since the 1960s, this topic has received much attention from researchers (Barth et al., 2022). By investigating whether accounting information is closely related to firm value, previous studies have focused on clarifying the usefulness of accounting information in valuation. These studies assess whether accounting information is a good summary measure of the events incorporated in securities price, they are value relevant because their use can provide a value of the firm that is close to its market value (Dumontier & Raffournier, 2002). Unlike event studies that focus on the market reaction to accounting disclosures over a short time interval, the association studies analyze the relationship between stock returns (stock price) and accounting data over a long period.

Ball & Brown (1968) were the first to find an empirical relationship between earnings and stock returns. Other studies have measured the strength of the association between changes in earnings and stock returns to clarify how changes in earnings summarize information incorporated in stock prices. Some studies indicate that the value relevance of accounting information increases over time (Collins et al., 1997; Francis & Schipper, 1999). However, the influence of earnings on stock prices decreases significantly over the years (Barth et al., 2022). The reduction is partly due to the increasing frequency and magnitude of the transitory revenue/cost components in earnings (Donelson et al., 2011).

In addition, the value relevance of accounting information is believed to be influenced by country factors (Al-Ani & Tawfik, 2021; Ali & Hwang, 2000; Rahman & Liu, 2021; Soderstrom & Sun, 2007). Barth et al. (2008), in a study of 21 countries, found that earnings of companies adopting International Financial Reporting Standards (IFRSs) have a greater impact on stock prices in comparison with firms applying national accounting standards.

Most of the prior results in value relevance studies are conducted in developed markets, where there is superiority in the availability of information, the ability to enforce reporting requirements from regulators, the percentage of sophisticated investors and there is sufficient competition among listed companies (Kouki, 2018; Stenheim et al., 2018). In contrast, developing markets have fewer listed companies, fewer knowledgeable investors, and less reporting requirements by regulators. This discrepancy raises questions about the relationship of accounting information to firm value in these developing countries. There is evidence that emerging markets lack the infrastructure to apply international accounting standards and, therefore accounting information has less effect on stock prices, or less value relevance (Acaranupong, 2021; Eccher & Healy, 2000). However, in some emerging countries such as China and the UAE, although the financial markets are still young and not fully aware of financial statements, accounting information is deemed relevant for the market (Alali & Foote, 2012; Chen et al., 2001). Even accounting information reported under IFRS in China was found to have more impact on stock prices (Liu & Liu, 2007). Thus, the results on the value relevance of accounting information in developing countries are inconsistent. National factors may be part of the problem.

The intangibles' value relevance is a topic that has been studied early. The studies focussing on the relevance of value estimates of intangible assets (Barth et al., 2001) have concluded that several types of intangibles are relevant to investors: capitalized software costs (Aboody & Lev, 1998), research and development (Feng et al., 2022; Zhao, 2002), patents (Hirschey et al., 1998), brands (Kallapur & Kwan, 2004), goodwill (Dahmash et al., 2009; Oliveira et al., 2010; Park & Jang, 2021), intellectual capital disclosure (Ricci et al., 2020; Solikhah et al., 2020), and advertising expenditures (Shah et al., 2009). Aboody & Lev (1998) suggest that capitalized software amounts summarize relevant information and the assets associate with market variables and future earnings. Goodwin & Ahmed (2006) indicated the indirect effect of intangibles on market values. Moreover, Ricci et al. (2020) show that stock market participants incorporate digitalization-related information into their business valuation process. Recently, by analyzing the textual content of 23,269 annual reports, Feng et al. (2022) find that descriptive R&D intensity positively affects firm value. These authors accepted that intangible assets increase the value relevance of accounting information such as earnings. In general, these studies have found that available estimates of intangible assets reliably reflect the assessed values of these assets by investors and that the items have a significant positive association with

share prices. In other words, the role of intangibles in valuation is getting important in the information technology era.

Meanwhile, few studies investigate the influence of intangible assets on the value relevance of accounting information. In a study in six emerging markets of the Gulf Cooperation Council (GCC), (Al-Ani & Tawfik, 2021) investigate the relationship between intangible assets and the value relevance of accounting information and find a positive relationship between intangible assets and earnings quality in terms of value relevance in KSA and Qatar. The finding is not found in other GCC countries. In another study, Zhao (2002) suggested that the reporting of total R&D costs increases the association of stock price with accounting earnings and book values in countries with complete R&D expensing.

In the Vietnam context, researchers have recently begun to pay attention to the value relevance of the accounting information of listed companies. Viet Ha et al. (2018) find that earnings per share and book value per share are positively associated with the stock price. Hai et al. (2015) show that the relationship between accounting data on financial statements and stock return is weak. However, in Vietnam, attempts to investigate the value relevance of intangible assets and their influence (such as R&D or all components together) on the value relevance of accounting information are very limited.

In the study, we explore whether recognized intangible assets help explain the variation of market values once the effects of traditional accounting data such as book value and earnings are controlled for. Consistent with previous studies (e.g., Oliveira et al., 2010; Ricci et al., 2020), we expect that recognized intangible assets are value relevant. Thus, our first hypothesis is:

Hypothesis 1. Recognized intangible assets are value relevant in explaining market equity value.

In the era of technology and information, companies increasingly appreciate the value of intangible assets. Meanwhile, investors are now paying great attention to the value of the assets. They no longer base their investment decisions on earnings and book value of the issuer's equity, but begin to use the value of intangible assets to consider for decision making. Intangible assets now play an important role for firms in the capital market and may contribute positively to the quality of accounting information. Thus, our second hypothesis is:

Hypothesis 2. Intangible assets positively impact the value relevance of accounting information.

3 Research design and data

3.1 Research design

To assess the information content of accounting data, we analyze the association between accounting information and stock price in a long term. Consistent with previous studies (e.g., Collins et al., 1997), we use Ohlson's (1995) model to investigate the value relevance of accounting information, in which a firm's market value is a function of the book value of equity and earnings.

Model 1: $PRICE_{it} = \alpha_0 + \alpha_1 BVPS_{it} + \alpha_2 EPS_{it} + \varepsilon_{it}$

Where: $PRICE_{it}$ is the stock price of firm i three months after the end of year t. $BVPS_{it}$ is the book value of equity per share of firm i at the end of year t. EPS_{it} is the earnings per share of firm i at the end of year t. ε_{it} is residuals.

According to the efficient market hypothesis, if the market is efficient, when information is announced it will be immediately reflected in the price of the stock. In other words, if the market is not efficient, the information reflected in stock prices needs a certain time lag. Since the Vietnamese stock market is considered to be inefficient, in this study, we take stock prices 3 months after the end of the fiscal year. The application of this price is also to ensure that all listed companies have completed the publication of year-end financial statements.

We control for some factors in all equations to test the value relevance of accounting information to the stock price. Firm size is considered an important factor to assess the financial position of enterprises. A larger business entity is more likely to attract more capital and thus impact the firm value (share price). So, we control the Firm size (SIZE) and expect Firm size shares a positive association with the stock price. Furthermore, a business with greater leverage often entails greater financial risk. That firm is more likely to be undervalued. Therefore, we control for leverage (LEV) in the model and expect LEV is associated negatively with the stock price. We also control for operating cash flows per share (CFPS) in our models and expect firms with larger operating cash flows to have more influence on the stock price.

We examine whether changes in stock prices are explained better when intangible assets are included, in conjunction with changes in book value and earnings in model 2. We expect that intangibles are positively associated with firm values (PRICE) when EPS and BVPS are controlled for. Then, we include an interaction term of EPS with dIA (a binary variable is coded as 1 if a firm owns intangible assets and 0 otherwise) to examine whether the value relevance of accounting measure (EPS) increases when a firm owns intangible assets. Therefore, the models are as follows:

Model 2: $PRICE_{it} = \alpha_0 + \alpha_1 BVPS_{it} + \alpha_2 EPS_{it} + \alpha_3 IA_{it} + \alpha_4 SIZE_{it} + \alpha_5 LEV_{it} + \alpha_6 CFPS_{it} + \varepsilon_{it}$

Model 3: $PRICE_{it} = \alpha_0 + \alpha_1 BVPS_{it} + \alpha_2 EPS_{it} + \alpha_3 dIA_{it} + \alpha_4 EPS_{it}*dIA_{it} + \alpha_5 SIZE_{it} + \alpha_6 LEV_{it} + \alpha_7 CFPS_{it} + \varepsilon_{it}$

Table 1: Definition of variables in models

Name of variable	Type	Abbreviation	Calculation	Expectation
Stock price	Dependent variable	PRICE	Stock price for firm i three months after the firm's fiscal year-end	
Book value per share	Independent variable	BVPS	Book value of equity per share	+
Earnings per share	Independent variable	EPS	Earnings per share at the end of the fiscal year	+
Firm size	Independent variable	SIZE	Logarithm of total assets at the end of the year	+
Leverage	Independent variable	LEV	Total debt to total assets ratio at the end of the year	-
Operating cash flows per share	Independent variable	CFPS	Operating cash flows/ Number of shares outstanding at the end of the fiscal year	+
Intangible assets per share	Independent variable	IA	Total intangible assets per share at the end of the year/ Number of shares outstanding at the end of the fiscal year	+
Probability of intangible asset	Independent variable	dIA	1 if a firm owns intangible assets and 0 otherwise	

3.2 Data

We collect financial data from the Fiinpro platform. The research sample includes all 618 non-financial companies listed on the two largest stock exchanges in Vietnam - Ho Chi Minh Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX) in the period from 2015 to 2020. Finance and insurance companies are eliminated because they have different policies and regulations. With the aforementioned number of companies, we obtain 3,708 observations. However, because some data are not available in the database, the final sample for analysis includes 3,388 observations.

4 Empirical results and discussions

4.1 Descriptive statistics and correlation between variables

Table 2 indicates the descriptive statistics of the main variables used in our models. The statistics are computed after removing missing values. The mean of Earnings per share (EPS), Stock price (PRICE) and, Book value per share (BVPS) are 2.065 VND, 23.020 VND, and 17.106 VND, respectively. On average, 82% of the firms disclosed information for intangible assets in their annual financial reports.

Table 2: Descriptive statistics

	N	Mean	St. Dev.	Min	Median	Max
PRICE	3,388	23,020.30	24,442.60	1,700	14,900	143,413
EPS	3,388	2,065.23	2,504.61	-2,896	1,372	13,190
BVPS	3,388	17,105.77	8,294.97	5,510	14,814	55,006
LEV	3,388	0.47	0.22	0.03	0.48	0.90
CFPS	3,388	2,298.54	5,462.70	-14,453	1,714.5	23,125
SIZE	3,388	27.29	1.53	23.77	27.20	31.59
IA	3,388	895.59	1,755.71	0.00	180.17	10,845.08
dIA	3,388	0.82	0.39	0	1	1

Table 3 presents the correlation matrix. Most variables are correlated significantly at the 1 % level. As expected, earnings per share (EPS), book value per share (BVPS), and intangible assets (IA) are significantly and positively correlated with the stock price (PRICE). Moreover, leverage (LEV) has a significantly negative correlation with these main variables. We computed the variance inflation factor (VIF) to check for multicollinearity. The highest VIF was less than 5.5, indicating no significant problems with multicollinearity.

Table 3: Spearman & Pearson correlation matrix

	PRICE	EPS	BVPS	LEV	CFPS	SIZE	IA	dIA
PRICE		0.74***	0.57***	-0.13***	0.32***	0.22***	0.16***	0.14***
EPS	0.74***		0.69***	-0.10***	0.38***	0.16***	0.15***	0.12***
BVPS	0.62***	0.68***		-0.09***	0.32***	0.19***	0.22***	0.11***
LEV	-0.13***	-0.10***	-0.06***		-0.05**	0.33***	0.01	0.07***
CFPS	0.32***	0.38***	0.32***	-0.08***		0.07***	0.06***	0.08***
SIZE	0.17***	0.16***	0.18***	0.34***	0.08***		0.09***	0.27***
IA	0.27***	0.23***	0.27***	0.02	0.10***	0.21***		0.24***
dIA	0.18***	0.15***	0.13***	0.06***	0.09***	0.28***	0.67***	

*Notes: *p < 0.1; **p < 0.05; ***p < 0.01*

4.2 Regression analysis and discussion

Table 4 summarizes the results of our regressions. We test three types of models corresponding to 3 columns, including Model 1: accounting information (earnings per share and book value per share) without intangible assets model, Model 2: accounting information (earnings per share and book value per share) with intangible assets model, and Model 3: accounting information (earnings per share and book value per share) with an interaction term of intangible assets model. To account for firm heterogeneity, we use panel data which allows controlling for unobservable variables. To decide between fixed or random effects, we perform a Hausman test where the null hypothesis is that the preferred model is random effects versus the alternative the fixed effects. Hausman tests (untabulated) indicate that fixed-effect approach is more appropriate. We calculate and use the consistent standard errors when presenting the regression results based on the method of Arellano (1987) to control heteroscedasticity and serial correlation.

In general, we obtain statistically significant F-statistics in all regressions, meaning that there is a significant relationship between our independent variables and the dependent variable (PRICE). All columns point out that the coefficients of EPS and BVPS are both positive and statistically significant at the 1% level. The finding suggests that both EPS and BVPS are positively related to PRICE, meaning that traditional accounting measures are positively associated with firm values. However, the magnitude of the EPS coefficient is much larger than that of BVPS, suggesting the value relevance of EPS is higher considerably. Investors seem to assess earnings as the more important information in valuing a company. As expected, in models 2 and 3, the stock price (PRICE) changes in

the same direction as firm size (SIZE) and operating cash flows (CFPS), meanwhile, it is negatively associated with leverage (LEV).

We investigate the value relevance of intangible assets in model 2 (including BVPS, EPS, and IA). In column 2, the coefficient estimate of IA ($\beta_3 = 0.513$) is positive and significant at the 10% level, indicating the positive effect of intangible assets on market values. The results provide evidence that recognized intangible asset is value relevant to investors, supporting hypothesis 1. Our findings show the important role of intangible assets in market values' variability and suggest that investors consider intangible items that are reported on the balance sheet when they value securities. The result is supported by previous studies such as Oliveira et al. (2010) in the Portuguese context.

In model 3, we assess the impact of intangible assets on the value relevance of accounting measures. Our main interest in this equation is the coefficient of interaction term of EPS and the probability of a firm owning intangible assets (dIA). We do not find evidence show that the probability of a firm owning intangible assets positively impact firm value because the coefficient of dIA is insignificant. However, we find a positively significant coefficient of EPSxdIA ($\beta_4 = 0.781$) at the 5% level. The result points out that when a firm owns intangible assets (i.e., dIA = 1), the total coefficient of EPS is 3.241 (i.e., 2.460 + 0.781), meaning that the association of EPS with market value increases due to the probability of a firm has intangible items. In other words, intangible assets positively impact the value relevance of accounting information (EPS), consistent with hypothesis 2.

Table 4: Regression results (Fixed effects models)

Dependent variable: PRICE			
	(1)	(2)	(3)
BVPS	0.405***	0.433***	0.456***
	(0.073)	(0.077)	(0.076)
EPS	3.159***	3.147***	2.460***
	(0.156)	(0.156)	(0.320)
IA		0.513*	
		(0.264)	
dIA			-1,507.347
			(1,201.991)
EPSxdIA			0.781**
			(0.318)
SIZE		1,825.329**	1,935.328**
		(794.900)	(794.477)
LEV		-8,554.698***	-8,887.486***
		(2,543.474)	(2,527.861)
CFPS		0.144***	0.142***
		(0.038)	(0.038)
Observations	3,388	3,388	3,388
R^2	0.288	0.295	0.297
Adjusted R^2	0.130	0.137	0.139
F Statistic	160.308***	105.356***	97.493***
Note:			*p<0.1; **p<0.05; ***p<0.01

5 Conclusions

The paper investigates whether recognized intangible assets in financial statements are value relevant and whether the intangibles can improve the value relevance of accounting measures in the Vietnam context. Our analysis shows that both intangible assets and traditional accounting items such as earnings per share and book value per share are positively associated with the stock price. More importantly, we find that intangible assets can contribute positively to the value relevance of accounting information. In other words, the influence of accounting information on firm valuation is stronger for firms with intangible assets. Our findings show that investors may consider intangible assets as an important factor in valuing firms. But the influence of the assets on the value relevance of earnings per share indicates investors even base on earnings per share more in valuation when intangible assets are recognized in balance sheets. Practically, the results of this

study are expected to be able to provide an overview for issuers related to investor behavior in the Vietnam context. To investors, our findings imply paying more attention to companies with reported intangibles can be helpful in valuing a business.

Theoretically, the results are expected to be a reference and add to the literature in the discussion of the value relevance of accounting information on stock prices in an emerging country like Vietnam and the effect of the recognized value of intangible assets in the era of information technology for investors.

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