

THE VALUE RELEVANCE OF INTANGIBLE NON-CURRENT ASSETS DURING DIFFERENT ECONOMIC CONDITIONS AND ACCOUNTING ENVIRONMENTS

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Abstract

The issue of value relevance of intangible non-current assets (NCA) is important in the financial reporting literature due to the ever increasing interest in the components of intangible assets items including goodwill and intellectual capital. This study examines the value relevance of reported intangible NCA among firms listed on the main board of Bursa Malaysia throughout a 12-year period from 1990 until 2001. During this time period, Malaysia went through three different economic and accounting environmental conditions. Early 1990s saw an excellent economic condition but with less stringent accounting regulatory period. However, 1997 and 1998 were the financial crisis period. In 1997, the Malaysian Accounting Standards Board (MASB) was established by the Malaysia government. From 1999 until 2001, Malaysia went through a recovery economic period plus a more stringent accounting regulatory framework. Based on the value relevance model, we find evidence that intangible NCA continuously show a negative association with firms' share market price throughout the three different economic periods

and accounting environments among our sample firms. However, as expected the association was not significant before the establishment of MASB compared to after. Our finding is consistent with extant studies on the issue of value relevance of intangible NCA during poor economic condition. However, our finding is not consistent with prior studies concerning value relevance of intangible assets during stable economic condition. Nevertheless, our finding is consistent with the on-going argument and theory of capitalized intangible assets more likely to reflect uncertain expected future cash flows, hence value relevance is perceived by investors to be biased.

Keywords: *Intangible NCA, value relevance, Malaysia, accounting environment, economic condition*

Introduction

The value relevance of intangible assets has always been of interest to accounting researchers due to the uncertainty nature of the assets (Godfrey, Hodgson, Holmes and Tarza, 2006). Malaysia issued accounting standards on intangible assets only in 2005 and implementation started from 2006. Previously, Malaysia did not have accounting standard on intangible assets and did not adopt the International Accounting Standard (IAS) 38, *Intangible Assets*, even though it was issued by the International Accounting Standards Board (IASB) in year 1998.

The importance of intangible assets information is highlighted due to components perceived or actually embedded in the assets. These components include items such as research and development (R&D) expenditures, goodwill, patent, brand-name and other identifiable intangibles (Godfrey and Koh, 2001). Nevertheless, the importance of unidentifiable intangible assets has been increasingly examined within other research context (Mauldin and Richtermeier, 2004). For example, the relevance of intellectual capital which typically includes the human capital, firms' structural capital and relational capital has been examined from the aspect of financial and non-financial disclosures (Iatridis, 2006).

The controversial issue of intangible assets reporting is on whether it is value relevant even though its association with firms' expected future cash flows is not certain. Furthermore, it is also important to understand whether intangible assets are value relevant in different economic conditions and accounting environment. Prior studies on value relevance of intangible assets (for e.g., Barth and Clinch, 1998; Godfrey and Koh, 2001; Han and Manry, 2004; Zhao, 2002) pay limited attention to investigate the influence of different economic condition per se. It is expected that during better economic conditions, intangible assets would be more value relevant compared to what would be during poor economic conditions. It is also expected that during stronger accounting regulatory periods, intangible assets would be more value relevant compared to weak accounting regulatory periods. The reporting of intangible assets amounts up to hundred millions of Ringgit in Malaysia throughout the 1990s (Zaleha, Hamezah, Muhd-Kamil and Jagjit, 2005a).

This study examines the value relevance of intangible assets reported within financial statements of firms listed on the main board of Bursa Malaysia. During the time period of the sample in this study, from 1990 until 2001, Malaysia went through three distinct economic and accounting environments. In early 1990, Malaysia went through a flourishing economic period but with a less stringent accounting regulatory framework. During 1997 and 1998, Malaysia went through a financial crisis period. At the same time, in 1997 the Malaysia government formed the Malaysian Accounting Standards Board (MASB), an accounting standards issuing body similar in context to the Financial Accounting Standards Board (FASB) in the US. Between 1999 until about 2001, Malaysia went through a recovery economic period within which a more stringent accounting regulation was introduced.

This study aims to find evidence of possible differences in the value relevance of intangible non-current assets (NCA) across three periods identified above. This study found, intangible NCA reported among listed firms in Malaysia to be negatively associated with firms' share prices for the sample firms before, during and after the establishment of MASB and for the financial crisis period of 1997-1998. For yearly sub-samples, years before and during crisis period of 1997-1998 provide evidence of consistent negative, but insignificant associations. All sub-samples for years after the crisis period showed consistent significant negative associations. These findings are consistent with extant literature (such as Cazavan-Jeny and Jeanjean, 2006) on the value relevance of intangible assets. They are also consistent with the theory of intangible assets generally reflecting uncertain expected future cash flows. This study contributes to the extant literature on the issue of value relevance of accounting numbers and especially on the value relevance of reported intangible assets in the presence of different economic conditions and accounting environments.

The next section of this paper presents the relevant literature, conceptual framework and hypothesis development on value relevance of intangible assets. Section Three discusses the methodology adopted in this study. Section Four discusses results from data analysis and Section Five concludes this paper.

Literature Review

Intangible NCA are assets with no direct reference to any particular physical item. Common items of intangible NCA include goodwill and R&D expenditures. Prior literature also includes computer software as intangible asset (Aboody and Lev, 1998). Capitalization of computer software has become an important issue, especially in the US, with the issuance of accounting standards on it. Other items listed among intangible assets include advertising expenditures, patents, trade names, trademarks, franchise costs and all deferred expenditures such as start-up costs (Godfrey et al., 2006) and deferred taxes (Arcelus, Mitra and Srinivasan, 2005). Prior literature suggests intangible NCA could not be easily linked to firms' value due to its uncertain association with firms' expected future cash flows (Aboody and Lev, 1998). Nonetheless, firms that exclude reporting of intangible NCA could likely contribute towards underestimating the firms' value (Arcelus et al., 2005).

In the case of accounting for goodwill, only purchased goodwill can be recognized within financial statements, and firms' internal goodwill is not allowed to be recognized. Purchased goodwill arises only when a firm pays higher than the fair value of the identifiable net assets when buying another firm. Goodwill is associated with the expected future performance or growth of the newly combined firms, and has been found to be value relevant (Churyk, 2004; Muhd-Kamil, Marzita, Radziah and Zaleha, 2003).

Accounting for R&D expenditures is still controversial even today (Eckstein, 2004). Although prior literature provides plenty of evidence on the usefulness of R&D expenditures (e.g., Boone and Raman, 2001; Bublitz and Ettredge, 1989; Ely and Waymire, 1999; Zhao, 2002), almost all relevant accounting standards that follow the IASB standards only allow the development costs to be capitalized. These standards proposed that research expenditures should be expensed. R&D activities are important to firms to ensure that they maintain their competitiveness within the industry in which they operate. Especially since early 1990s, there has been rapid technological change affecting products and services innovation and marketing. Among other things, firms need to make available reliable software in order to increase sales and revenues of their products (De Angelis, Habib, Davide and Naghshineh, 2005).

Even though not all concepts of intangible assets can be capitalized in accounting, all of them are useful in the realization of firms' future cash flows (Arcelus et al., 2005; Han and Manry, 2004). For example, advertising expenditures are incurred to ensure increase in future revenues from the advertisement of products and services (Bublitz and Ettredge, 1989). Human resource expenditures such as training costs are incurred to ensure increase in future firms' performances overall, in sales and service revenues. Human capital expenditures that fall within the category of intellectual capital influence the perception of financial statement users towards the firms, in terms of value and image (Stewart, 1997). Other intangible assets, such as patents, brand name, trade mark, and trade names influence firms' product prices, and eventually revenues and earnings (Godfrey and Koh, 2001).

Although prior studies generally found intangible assets to be value relevant, there is only limited evidence on the influence of economic conditions and accounting environment on the value relevance of these items. Prior studies suggest that economic conditions and accounting environment affect the value relevance of accounting numbers (see Davis-Friday, Eng and Liu, 2006; Hall and Oriani, 2006).

Economic Condition and Accounting Environment in Malaysia

Malaysia went through strong economic growth during the early 1990s. Bank Negara Malaysia, (BNM, 2000) the central bank of Malaysia, reported that the annual gross national product (GNP) were between 13 to 14 percent per annum during early 1990s until year 1996. The economic condition started to weaken during 1997 with the GNP growth reduced by about 4 percent and becoming worst during 1998 with a reduction of almost 7.5 percent (BNM, 2000). The economic condition stabilized by the end of 1998 and year 1999 showed growth in the GNP with an increase from the previous 1 percent per annum growth in 1998 to 4.2 percent per annum growth in 1999 (BNM, 2000).

Malaysia's economic conditions throughout the time period of this study coincides with the world economic environment, especially during 1997 and 1998, where Malaysia was one of the countries badly hit by the Asian financial crisis (Davis-Friday et al., 2006; Graham, King and Bailes, 2000).

With regards to accounting environment, there were two accounting bodies controlling the accounting regulation since the 1970s until early 1997, namely the Malaysian Institute of Accountants (MIA) and the Malaysian Institute of Certified Public Accountants (MICPA). MICPA was previously known as the Malaysian Association of Certified Public Accountants (MACPA). The existing accounting standards during that time period were not mandatory for implementation by listed firms. Accounting standards on intangible assets available at that time include the Malaysia Accounting Standard (MAS) 6, *Accounting for Goodwill*, issued by the MIA. While the International Accounting Standard (IAS) 9, *Research and Development Costs*, was issued by the IASB. IASB was previously known as the International Accounting Standards Committee (IASC). MAS 6 and IAS 9 standards were both applicable for implementation until 1997 only, among the MIA members. While MICPA members were only required to adopt and apply IAS 9 in their own individual practice.

In year 1997, the Malaysian government set up the Malaysian Accounting Standards Board (MASB) to take the responsibility of accounting standards in Malaysia. MASB per se is not authorized to regulate the accounting standards. Authority comes from the Securities Commission and Bank Negara Malaysia for the regulation of accounting standards in Malaysia. In 1998 and 1999, MASB rigorously worked on finalizing accounting standards known as the MASB standards, for implementation starting mid-1999.

In 1998, IASB issued IAS 38 *Intangible Assets*, guiding accounting for intangibles in countries adopting the IASB standards. However, IAS 38 was not adopted in Malaysia at that point. Malaysia only adapted International Financial Reporting Standard (IFRS) 38 *Intangible Assets*, which is a modified version of IAS 38, to become Financial Reporting Standard (FRS) 138 *Intangible Assets*, issued by MASB for implementation in 2006. IAS 38 provides guidelines on the accounting of all identifiable intangibles, other than R&D expenditures and goodwill. This would include patents, trademark, trade-name, and identifiable contracting documents such as franchise costs, customer list, advertising and marketing costs. Standards on intangible assets applicable in Malaysia from 1999, after the establishment of MASB, include MASB 21, *Business Combinations*, and MASB 4, *Research and Development Costs*.

In order to be compatible with other international standards, in year 2004, MASB issued Financial Reporting Standards (FRS) replacing MASBs. As mentioned above, FRS 138 became applicable in Malaysia from 2006. FRS 138 covers accounting of all intangibles including R&D expenditures, goodwill and all other identifiable intangibles. FRS 138 and other accounting standards (e.g., Statement of Financial Accounting Standards (SFAS) 2 *Accounting for Research and Development Costs*; SFAS 142 *Goodwill and Other Intangible Assets*, issued by FASB) require firms to recognize all intangible assets at cost. Nevertheless, FRS 138 allows intangibles to be revalued after initial recognition, subject

to marketability of the specific intangible. FRS 138 is conceptually and technically similar to IFRS 38, *Intangible Assets*, issued by the IASB. See Appendix 1 for a summary of the intangible assets standards applicable in Malaysia during the time period of this study.

Conceptual Framework

Conceptual framework used in this study is based on the decision usefulness paradigm. This paradigm suggests that accounting information is conceptually useful if empirically found to be associated with financial statements users decision making (Riahi-Belkaoui, 2000), even when the information might not be stated at their best current value (Scott, 2000). Under this paradigm, financial statement users refer to the capital market participants, mainly investors and financial analysts, who make investments decisions which involved valuation of firms (Beaver, 2002; Riahi-Belkaoui, 2000).

The decision usefulness paradigm suggests that usefulness of information in intangible NCA may be explained by the signaling theory. Availability of signals from intangible NCA information links the information towards the value relevance concept. Signaling theory suggests that managers' action shown through the reporting of accounting information provide signals to the capital market (Scott, 2000). The idea of signaling theory is in order to ensure that capital market do not undervalue firms in their decision making, hence information provided by firms' managers ought to be close to the truth (Scott, 2000, p. 411). The same applies to intangible NCA information. Reported intangible NCA and changes in intangible NCA should signal the true position of firms related to intangible assets issues. If firms provide the wrong signal to the market and eventually the market realizes the truth, market will penalize firms by lowering firms' share market prices, which would affect managers' benefits later should management compensation be based on firms' share market prices (Ball, Robin and Wu, 2003).

For example, changes in reported intangible NCA could be due to goodwill from mergers and acquisition activities (Churyk, 2004), the acquiring of patents by firms (Godfrey and Koh, 2001), the capitalization of R&D costs (Han and Manry, 2004; Boone and Raman, 2001), or the capitalization of computer software costs (Aboody and Lev, 1998). Once capital market participants perceived the right signals from intangible NCA information, they will react in a way which makes intangible assets information relevant for decision-making involving the particular firm value (Frank, 2002).

In discussing the concept of relevance with regards to accounting information, Riahi-Belkaoui (2000) believes that accounting information is relevant if the information can influence decisions made by decision makers. For example, intangible NCA is relevant towards capital market participants if it provides information useful for the setting of firms' share market prices. Aboody and Lev (1998) feel that US firms' software capitalization has value relevance because they found that capitalized software among 163 US firms between 1987 until 1995 period was positively associated with firms' share market prices. Value relevance concept is based on evidence found in the theory of efficient market hypothesis (EMH).

EMH assumption is that capital market participants make decisions efficiently based on public as well as some private information (Easton, Eddey and Harris, 1993). EMH suggest that at all times, firms' share market prices conceptually reflected all needed information about firms' value (Riahi-Belkaoui, 2000). Hence, no individual capital market participant can obtain abnormal returns by trading firms' shares based on the same information that other participants utilized. In this study, the assumption is that intangible NCA provide reliable and relevant public and available private information for the purpose of decision-making, and hence, should be significantly associated with firms' value. Figure 1 below presents the conceptual flow from intangible NCA information to firms' share prices under the decision usefulness paradigm.

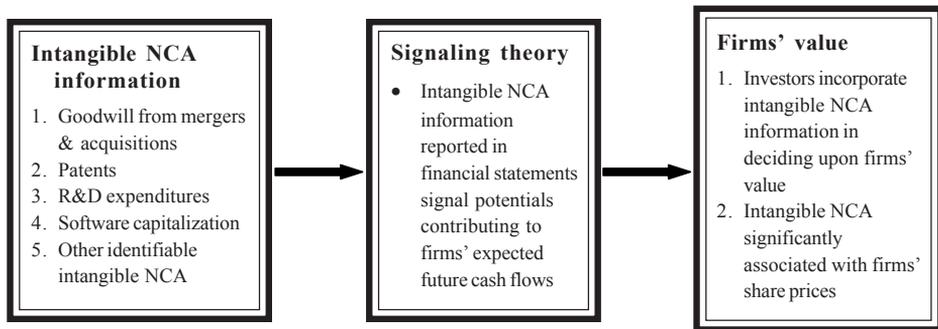


Figure 1: Conceptual Flow of the Intangible NCA Information under the Decision Usefulness Paradigm

Hypotheses Development

Development of hypotheses is focused to answer the main question asked in this study, namely whether intangible NCA has value relevance during different economic and accounting environments. For the purpose of hypotheses development, evidence on the existence of value relevance in intangible NCA refers to its significant association with firms' value. In order to examine the value relevance of intangible NCA during the different time periods, discussion on hypotheses development is separated into three different time periods. Each time period will be represented by both the economic and accounting environments. The first interval covers the stable economic growth period which coincides with a weak accounting regulatory environment. The second phase is during the crisis period which coincides with the beginning of a new accounting regulatory era. The final interval covers the economic recovery period having a stable accounting regulatory environment.

Stable Economy and Weak Accounting Regulation

During a stable economic growth period, prior studies found intangible NCA to be value relevant, whereby intangible NCA is positively associated with firms' value (see Aboody and Lev, 1998; Churyk, 2004; Godfrey and Koh, 2001; Muhd-Kamil et al., 2003). During an upward trend in the economic growth, intangible NCA would reflect potentials as good as

any other firms' assets (Aboody and Lev, 1998). For example, reporting of goodwill or R&D expenditures would reflect information about expected future cash flows of firms. As such, reported intangible assets would provide clear and convincing information assisting financial statement users to make good investment decisions. Although during this period, the accounting environment might not be thoroughly regulated, existence of a stable economy would assist in creating confidence among capital market participants to make more investments involving intangible assets.

Apart from intangible NCA, prior literature also found positive association between components of intangible NCA and firms' share prices. For example, Aboody and Lev (1998) found capitalized software among US firms for the period 1987-1995 positively associated with firms' share market prices. This study also found positive association between capitalization of software expenditures with both operating income and net income, until two years after capitalization activities of software expenditures. Based on Malaysian data for the period 1992-1997, Muhd-Kamil et al. (2003) found goodwill to be positively associated with firms' market value. Based on US data for the period 1996-1998, Churyk (2004) also found similar results. Kohlbeck (2004) found that almost all components of intangible assets of US publicly traded banks are value relevant and reliable towards firms' valuation for the period 1994-1998, whether they were recorded or not.

Nevertheless, there has been some research with findings that were not consistent with the above. For instance, Bublitz and Ettredge (1989) based on US firms data for the period 1974-1983, found advertising expenses to be negatively associated with cumulative abnormal returns (CAR), while R&D expenditures were insignificantly associated. Recently, Cazavan-Jeny and Jeanjean (2006) found that for the period 1993-2002, capitalized R&D expenditures among French firms to be negatively associated with share market prices and returns.

Prior literature, therefore, provides evidence on investors' utilization of information in intangible assets for decision on firms' valuation. However, professional investors, such as financial analysts, continuously suggest that intangible assets are always associated with high uncertainty (see Barron, Byard, Kile and Riedl, 2002). Zaleha et al. (2005a, 2005b) found that earnings forecasts errors tend to be larger during weak accounting regulatory period compared to during stronger accounting regulatory period, among financial analysts in Malaysia utilizing intangible assets information. Due to the effect of lack in accounting regulation prior to MASB establishment, plus evidence from prior studies, it is expected that the sign of association between intangible NCA and firms' share prices would not be very clear before 1997. Therefore, with regards to intangible NCA information, value relevance during a stable economy but poor accounting regulatory period, that is before 1997, we hypothesized the existence of association between intangible NCA information and firms' share price but with no specific sign. Hence, hypothesis 1 is stated as follows:

Hypothesis 1: Reported intangible NCA is associated with firms' share prices during the period of a stable economy but weak accounting regulatory environment.

Economy in Crisis and New Accounting Environment

This study also investigates the value relevance of intangible NCA during economic crisis period. Large investments in East Asian countries were cited to be one of the reasons for the July 1997 Asian financial crisis (Graham, King and Bailes, 2000). Such large investments involve huge debts, mostly from international markets. When the currency value of a particular country suddenly falls, international debts create massive financial problems to firms and the whole country (Facts on File, 2004). Financial management practice traditionally suggests that firms should not charge many assets to debts during economic crisis compared to time of stable economic periods (Graham and Harvey, 2001; Penman, 2001; Ross, Westerfield and Jaffe, 2005) in order not to reduce the value relevance of the assets drastically.

However, during crisis period, value relevance in intangible NCA might not be affected as much as for tangible NCA. It is expected that during economic crisis periods, the higher tangible NCA being attached to debts compared to equity, the less information content these tangible NCA provide to financial analysts and investors in predicting expected future cash flows (Fan and So, 2004). This is because, more future cash flows from the tangible NCA will be utilized on paying debts and less towards paying dividends. In the end, future cash flows from these tangible NCA will be utilized less towards increasing shareholders value, hence the reported tangible NCA will become less value relevant.

Nonetheless, the information content of intangible NCA during the Asian financial crisis period might also be subjected to restrictions already attached on firms' reported NCA overall. Firms with large debts might have debt covenants requiring firms to maintain specific levels of tangible as well as intangible NCA (Cotter, 1999). In the presence of both tangible and intangible NCA, investors' reaction during crisis period can be explained based upon the abandonment option theory. This theory suggests that investors put value on firms based upon the availability of reliable assets for prediction of immediate cash flows during the period (Sin and Watts, 2000). Prior literature found the positive association of book value and share prices to be stronger than the positive association of earnings and share prices, among problematic firms (Franzen, 2000; Graham and King, 2000; Graham et al., 2000; Hayn, 1995; Tan, 2001). This finding corroborate the abandonment option hypothesis that suggests, investors prefer firms' book value of net assets more than earnings, when firms are in unstable economic conditions (Hayn, 1995).

Prior literature also found generally in cases where inflation increases overall NCA prices, NCA information is value relevant since it would reflect further potential in firms' expected future cash flows (Davis-Friday, 2001; Easton and Edey, 1997; Easton et al., 1993; Gordon, 2001). However, investors could be reluctant to increase their investments during crisis periods if they do not anticipate prospects in the economic environment (Green, 2004).

Although prior literature reveals that investors utilize intangible NCA information towards decision on firms' value, however, the value relevance of intangible NCA is not expected to be the same during a poor economic period compared to otherwise. Especially following the concept of the abandonment option hypothesis, plus the issue of uncertainty with regards to expected future cash flows as well as illiquidity associated with intangible

NCA might result in unexpected sign in the value relevance of intangible NCA information. Intangible NCA regularly found to be associated with higher uncertainty and less liquid (see Barth, Kasznik and McNichols, 2001b; Eckstein, 2004; Zaleha et al., 2005b), and the condition is expected to deteriorate much further during crisis period. The more firms invest in intangible NCA would probably result in a negative reaction from investors, especially during crisis period (see Cazavan et al., 2006). Furthermore, in the presence of an unstable accounting regulatory environment, where investors might have only little confidence in the reporting regulation of the intangible assets, the situation could exacerbate. Hence, it could be hypothesized that:

Hypothesis 2: Reported intangible NCA is negatively associated with firms' share prices during the period of economic crisis and in the presence of a new accounting environment.

Economy in Recovery and Stable Accounting Environment

The value relevance of intangible NCA in the presence of a strong accounting regulatory period should be easier to predict compared to in the absence of accounting regulation (Barth et al., 2001a; Hung, 2001). Since accounting standards aim to assist accountants and preparers to report and present more reliable and relevance accounting information, existence of a strong accounting regulatory environment is expected to reflect the existence of more reliable intangible NCA information. Furthermore, with the extreme growth in business activities globally through the internet, firms have to invest in intangible assets if they want to stay competitive as a going concern (Aboody and Lev, 1998; Barron et al., 2002). Therefore, it is expected that firms going into the Y2K era will compete each other for more intangible assets investments to survive and being compatible (Barron et al., 2002). The presence of a strong accounting regulatory environment during this period should be expected to provide more emphasis on the value relevance of intangible NCA information. Therefore, it is hypothesized that:

Hypothesis 3: Reported intangible NCA is positively associated with firms' share prices during the period of a stable economy and stringent accounting regulatory environment.

Methodology

Value Relevance Concept

Value relevance concept within this study is investigated under the valuation of firms at one point in time using the Price Model (Easton et al., 1993). Empirical framework for the Price Model is designed based on the understanding of the decision usefulness paradigm of accounting information, as discussed previously. Decision usefulness paradigm suggests that reported intangible NCA will have value relevance if it is significantly associated with firms' value (Scott, 2000), where in this study is represented by firms' share market prices.

Empirical Framework for the Model

The Price Model in this study follows Barth and Clinch (1998) as well as Easton et al. (1993) models developed on the conceptual framework of Ohlson (1995) and Feltham and Ohlson (1996) models. The Price Model represents a summary measure of firms' value where value, P or price per share comes from a combination of information on firms' book value of equity (BVE) per share and current earnings ($EARN$) per share for firm i at time t , as follows:

$$P_{it} = \alpha_0 + \alpha_1 BVE_{it} + \alpha_2 EARN_{it} + \varepsilon_{it} \quad (1)$$

Generally, to take into consideration the existence of intangible NCA within the equation, BVE can be broken down into a combination of NCA, current assets (CA) and total liabilities (TL). Focusing on NCA per se, it can also be broken down into a combination of intangible NCA (INCA) and tangible NCA (TNCA). In balance sheet presentation during the time period of this study, TNCA comprised of mainly fixed assets or fixed NCA (FNCA) and investments assets or investments NCA (IVNCA). Using the overall breakdown of NCA, equation (1) can be stated as follows, with each variable having its own coefficients in the multiple regression analysis:

$$P_{it} = \Omega_0 + \Omega_1 INCA_{it} + \Omega_2 FNCA_{it} + \Omega_3 IVNCA_{it} + \Omega_4 CA_{it} + \Omega_5 TL_{it} + \Omega_6 EARN_{it} + \varepsilon_{it}$$

In the final Price Model above, P is the year-end market price per share; INCA, FNCA, IVNCA, CA and TL are year-end intangible NCA per share, fixed NCA per share, investment NCA per share, current assets per share and total liabilities per share respectively for firm i at time t . EARN is current earnings for firm i at time t . The error term (ε) and the slope (Ω_0) represent all other information influencing P which is not captured in other variables in the regression model (Barth & Clinch, 1998).

Model and Measurement of Variables

Based on the empirical framework above, this study proposes the following Price Model to test for our value relevance issue:

$$P_{it} = \lambda_0 + \lambda_1 INCA_{it} + \lambda_2 FNCA_{it} + \lambda_3 IVNCA_{it} + \lambda_4 CA_{it} + \lambda_5 TL_{it} + \lambda_6 EARN_{it} + \varepsilon_{it}$$

Where:

- P_{it} is market price per share for firm i at time t (fiscal year-end).
- $INCA_{it}$ is reported year-end book value of intangible NCA per share for firm i at time t .
- $FNCA_{it}$ is reported year-end book value of fixed asset or property, plant and equipment per share for firm i at time t .
- $IVNCA_{it}$ is reported year-end book value of investment NCA per share for firm i at time t .
- CA_{it} is year-end reported book value of current assets per share for firm i at time t .
- TL_{it} is year-end reported book value of total liabilities per share for firm i at time t .

- $EARN_{it}$ is reported earnings before extraordinary items per share for firm i at time t .
- ε_t represent error term in this regression.

Coefficient of interest in the Price Model is coefficient λ_1 which represent intangible *NCA* usefulness for investors' decision-making. In the model above, *INCA* is predicted to be significantly associated with P during the first interval of time period of our study, that is, in the presence of a stable economy but having a less stringent accounting environment (i.e. H1) due to it being conceptually associated with expected future cash flows (Aboody and Lev, 1998). During the second interval of our study, that is, during economic crisis and the beginning of a new accounting environment, *INCA* is expected to be negatively associated with P (i.e. H2) due to its highly uncertain association with expected future cash flows (Cazavan et al., 2006). While during the final phase of our study, that is, during economic recovery and especially having more stringent accounting environment, *INCA* is expected to be positively associated with P (i.e. H3).

On the other hand, all tangible *NCA* components, namely fixed assets (*FNCA*) and investments (*IVNCA*) are expected to be positively associated with P during all economic and accounting regulatory periods. *CA* and *EARN* are also expected to be positively associated with P during all economic and accounting periods. However, *TL* is expected to be negatively associated with P during all periods based on the argument that it is the risk component of firms' book value of equity.

Sample Data

This study collected firm-years data of all industries from the Corporate Handbook published by Thomson Information as well as the Annual Handbook published by Bursa Malaysia. Sample data cover years 1990 to 2001. Data was divided into the three economic and accounting environment phases: before crisis and before the establishment of MASB up to year 1996 (which we refer to as *pre-crisis* period); during economic crisis and the establishment of MASB, years 1997 and 1998 (which we refer to as *crisis* period); and after crisis and post-establishment of MASB starting year 1999 (which we refer to as *post-crisis* period).

Descriptive Statistics

Tables 1A, 1B and 1C provide statistics for variables during pre-crisis, crisis and post-crisis period respectively. Price per share (variable P) for this study sample show highest mean value during period of pre-crisis at RM3.514 per share (in Table 1A) compared to crisis at RM1.458 per share (in Table 1B) and post-crisis at RM1.484 per share (in Table 1C). This is consistent with pre-crisis period which is reported to be the booming period in South-East Asian economy (Facts on File, 2004). Mean values of *FNCA* distribution (1.064 during pre-crisis, 1.341 during crisis and 1.190 during post-crisis) and *IVNCA* (0.718 during pre-crisis, 0.874 during crisis and 0.691 during post-crisis) throughout the three economic and accounting periods seems to show similar trends of higher amount of overall tangible assets during crisis period. This probably results from continuous capital investments initiated and formalized during pre-crisis period can only be seen in financial reports during crisis period.

On the other hand, intangible assets (variable INCA) distribution (0.159 during pre-crisis, 0.277 during crisis and 0.350 during post-crisis) shows a tendency of an increase from pre-crisis to post-crisis period for this study sample data. One reason for the increase in INCA could be from the increase in activities of mergers and acquisitions after the crisis period (Thillainathan, 2000), resulting in an increase in reported goodwill amount, hence leading to an increase in INCA. Furthermore, in the absence of specific accounting regulation on intangible NCA, firms in Malaysia show tendency to report goodwill as a permanent item during the time period of this study (Tan, 1997), which also contribute to the higher amount of intangible NCA during post-crisis compared to pre-crisis period.

Table 1A: Descriptive Statistics of Variables for Sample Data Period 1990-1996 (N=2228)

Variables	Mean	Median	Std.Dev	Skewness	Kurtosis	Min	Max
P	3.514	3.305	1.624	0.380	-0.915	1.010	7.000
INCA	0.159	0.002	0.556	22.811	797.222	-0.746	20.456
FNCA	1.064	0.829	1.025	2.923	21.784	0.000	13.641
IVNCA	0.718	0.257	1.337	7.738	98.861	-0.001	22.932
EARN	0.367	0.180	0.954	17.570	532.518	-4.555	31.733
CA	2.749	1.299	4.999	4.852	30.839	0.007	56.670
TL	3.029	1.001	6.770	5.245	35.981	0.000	77.830

Table 1B: Descriptive Statistics of Variables for Sample Data Period 1997-1998 (N=822)

Variables	Mean	Median	Std.Dev	Skewness	Kurtosis	Min	Max
P	1.458	1.250	0.768	0.607	-0.749	0.300	3.200
INCA	0.277	0.010	0.735	5.384	39.477	0.000	7.955
FNCA	1.341	0.888	1.659	3.388	20.400	0.000	16.050
IVNCA	0.874	0.256	1.749	6.010	56.331	-0.000	23.838
EARN	0.201	0.100	1.141	-0.025	11.999	-8.670	8.100
CA	2.116	1.270	3.236	5.142	37.457	0.000	38.741
TL	4.493	1.826	9.964	6.984	65.813	0.000	118.892

Table 1C: Descriptive Statistics of Variables for Sample Data Period 1999-2001 (N=1045)

Variables	Mean	Median	Std.Dev	Skewness	Kurtosis	Min	Max
P	1.484	1.360	0.824	0.423	-0.842	0.100	3.300
INCA	0.350	0.020	0.843	4.700	29.304	0.000	9.000
FNCA	1.190	0.765	1.627	4.168	30.701	0.000	18.482
IVNCA	0.691	0.150	2.310	17.228	396.436	-0.028	58.676
EARN	0.205	0.080	0.983	1.208	9.479	-5.630	7.480
CA	1.383	1.017	1.582	3.898	28.431	0.000	19.401
TL	3.605	1.324	10.185	9.021	95.838	0.000	123.266

Findings and Discussion

Pearson Correlations

Tables 2A, 2B and 2C present finding on Pearson correlations for variables during pre-crisis, crisis and post-crisis period respectively. Intangible assets (variable INCA) show consistent negative correlation with *P* but significant only during post-crisis period (see Table 2C) (where $\beta = -0.108$ at $p < 1\%$). Findings do not support any of the hypotheses. Although direction of correlation between INCA and *P* during crisis period is negative (see Table 2B), as predicted in terms of sign, but it is insignificant. As predicted, fixed assets (variable FNCA) show consistent positive correlation with *P* across the three studied periods (where $\beta = 0.192$ at $p < 1\%$ during pre-crisis; $\beta = 0.165$ at $p < 1\%$ during crisis; and $\beta = 0.118$ at $p < 1\%$ during post-crisis). Investment assets (variable IVNCA) show no significant correlation with *P* during any of the studied intervals.

Table 2A: Pair-Wise Correlations of Variables for Sample Data Period
1990-1996 (N = 2228)

	INCA	FNCA	IVNCA	EARN	CA	TL
P	-0.029	0.192***	0.019	0.106***	0.148***	0.134***
INCA		-0.036*	0.064***	0.194***	0.116***	0.008
FNCA			-0.095***	0.039*	-0.079***	-0.039*
IVNCA				0.064***	0.312***	0.324***
EARN					0.033	-0.025
CA						0.933***

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2B: Pair-Wise Correlations of Variables for Sample Data Period
1997-1998 (N = 822)

	INCA	FNCA	IVNCA	EARN	CA	TL
P	-0.031	0.165***	-0.003	0.104***	-0.001	0.151***
INCA		-0.054	0.051	0.272***	0.064*	0.188***
FNCA			-0.029	-0.172***	0.112***	0.042
IVNCA				0.022	0.296***	0.138***
EARN					-0.059*	-0.166***
CA						0.291***

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2C: Pair-Wise Correlations of Variables for Sample Data Period 1999-2001 (N = 1045)

	INCA	FNCA	IVNCA	EARN	CA	TL
P	-0.108***	0.118***	-0.024	0.120***	0.078**	0.121***
INCA		-0.066**	0.013	0.376***	0.047	0.260***
FNCA			-0.022	-0.178***	0.222***	0.118***
IVNCA				0.000	0.356***	0.175***
EARN					0.007	-0.143***
CA						0.066**

*p < 0.10, **p < 0.05, ***p < 0.01

An interesting finding with regards to post-crisis period (see Table 2C) is concerning INCA compared to FNCA correlations with P. While fixed assets (variable FNCA) is positive and significantly correlated (where $\beta = 0.118$ at $p < 1\%$) with P, intangible assets (variable INCA) on the other hand, is negative and significantly correlated (where $\beta = -0.108$ at $p < 1\%$) with P. Correlation between intangible NCA and P differs from expectation in H3. In order to find stronger evidence on the association between intangible NCA and firms' share market prices, multiple regression analysis is undertaken.

Multiple Regressions Based on Economic and Accounting Periods

Table 3 presents results from regressions of price per share (variable P_{it}) on INCA and other independent variables. This analysis reveals interesting results concerning intangible NCA. Intangible NCA (variable INCA) is negatively associated with P during all economic and accounting periods (where $\beta = -0.201$ at $p < 1\%$ during pre-crisis; $\beta = -0.115$ at $p < 1\%$ during crisis period; and $\beta = -0.258$ at $p < 1\%$ during post-crisis period). Findings from multiple regression analysis support H1 (i.e. INCA is associated with P during pre-crisis period) and H2 (i.e. INCA is negatively associated with P during crisis period) but do not support H3 (i.e. INCA is positively associated with P during post-crisis period).

The consistent negative and significant associations suggest several issues in relation to sample examined in this study. First, reported intangible assets are perceived as value relevant by investors, regardless of economic periods and accounting environments. Second, users are however biased towards the reporting of intangible NCA, regardless of economic and accounting regulatory periods. Third, findings support the perceived need to review accounting standards on the reporting of intangible assets (Eckstein, 2004).

Table 3: Mean Coefficient Estimates for Regressions of Price (P) on Non-Current Assets

	Exp. Sign	Pre-Crisis	Exp. Sign	Crisis	Exp. Sign	Post-Crisis
Intercept		2.992***		1.304***		1.362***
INCA _{it}	+/-	-0.201***	-	-0.115***	+	-0.258***
FNCA _{it}	+	0.318***	+	0.088***	+	0.051***
IVNCA _{it}	+	-0.018	+	-0.002	+	-0.031***
CA _{it}	+	0.083***	+	-0.015*	+	0.042**
TL _{it}	-	-0.021	-	0.016***	-	0.018***
EARN _{it}	+	0.173***	+	0.133***	+	0.225***
F-value		30.969***		13.111***		21.105***
Adj.R ²		7.47%		8.13%		10.35%
N		2228		822		1045

*p < 0.10, **p < 0.05, ***p < 0.01

With regards to tangible NCA, as predicted, findings show that during all economic and accounting periods, fixed assets (variable FNCA_{it}) is positively associated with P (where $\beta = 0.318$ at $p < 1\%$ during pre-crisis; $\beta = 0.088$ at $p < 1\%$ during crisis period; and $\beta = 0.051$ at $p < 1\%$ during post-crisis period). However, variable IVNCA is negatively associated with P during post-crisis period (where = -0.031 at $p < 1\%$), direction not expected.

Multiple Regressions based on Yearly Sub-Samples

In Tables 4A, 4B and 4C, data is partitioned into yearly sub-samples within each economic and accounting period: pre-crisis, crisis and post-crisis respectively. During pre-crisis period (see Table 4A), intangible NCA (variable INCA_{it}) is not significantly associated with P, but consistently show negative sign throughout 1990 to 1995. This finding may suggest that due to lack of guidance on the accounting of intangible assets, financial statement users show less confidence towards the reporting of intangible NCA. The consistent negative sign shows a tendency that the reporting of intangible assets might be seen as bias and reflecting negative expectation about firms' future cash flows to the capital market participants. As predicted, tangible NCA (variable FNCA_{it}) consistently show positive association with P, and significant in six out of seven yearly sub-samples, at less than 1% level.

During crisis period (see Table 4B), intangible NCA (variable INCA_{it}) is not significantly associated with P, neither in 1997 nor 1998. Hence, the results do not support H2. The insignificant associations might suggest that due to INCA uncertain association with firms' future cash flows, the reporting of intangible assets during crisis period is not value relevant to investors. In the case of tangible NCA, variable FNCA is positively associated with P at less than 1% level during both 1997 and 1998. Overall, the findings during crisis period of this study could be explained as follows. Years 1997 and 1998 seem to represent uncertainty in all areas of business, including accounting regulation and economic environment in Malaysia. Although the new accounting regulation began at the end of

Table 4A: Mean Coefficient Estimates for Regressions of Price (P) on Non-Current Assets Based on Yearly Regressions During Pre-Crisis Period

	Exp. Sign	1990	1991	1992	1993	1994	1995	1996
Intercept		1.882***	1.893***	1.474***	3.654***	3.963***	2.656***	4.438***
INCA _{it}	+/-	-0.544	-0.261	-0.109	-0.086	-0.211	-0.418	0.047
FNCA _{it}	+	0.439	0.567***	0.295***	0.376***	0.660***	1.086***	0.502***
IVNCA _{it}	+	0.470**	-0.112	0.038	-0.095	0.263**	0.972***	-0.069
CA _{it}	+	0.175	0.013	0.097*	0.075	0.311***	1.897***	0.158***
TL _{it}	-	-0.125	0.047	-0.032	-0.011	-0.147**	-1.261***	-0.018
EARN _{it}	+	3.798***	0.326**	0.070	0.002	-0.131	-0.077	0.250
F-value		4.940***	13.649***	7.085***	2.973***	12.325***	35.512***	11.745***
Adj.R ²		7.28%	18.97%	10.15%	3.07%	13.61%	29.74%	11.95%
N		302	325	324	374	432	490	476

*p < 0.10, **p < 0.05, ***p < 0.01

Table 4B: Mean Coefficient Estimates for Regressions of Price (P) on Non-Current Assets Based on Yearly Regressions During Crisis Period

	Exp. Sign	1997	1998
Intercept		1.546***	1.308***
INCA _{it}	-	0.043	-0.050
FNCA _{it}	+	0.130***	0.109***
IVNCA _{it}	+	0.003	0.001
CA _{it}	+	-0.001	-0.003
TL _{it}	-	0.011***	0.019***
EARN _{it}	+	0.091	0.147***
F-value		3.317***	10.923***
Adj.R ²		3.22%	10.87%
N		418	489

*p < 0.10, **p < 0.05, ***p < 0.01

1997, new accounting standards issued were only implemented from 1999. Furthermore, the negative effect from the Asian financial crisis was most distinct in 1998 and gradually reduced as Malaysia approached 1999 (BNM, 2000). Hence, intangible NCA associations with *P* were both insignificant during 1997 as well as 1998.

During post-crisis period (see Table 4C), intangible assets (variable INCA_{it}) show significant association with *P* in yearly sub-samples, but not in the expected direction. Hence, this does not support H3. However, this finding is similar to Cazavan-Jeny and Jeanjean (2006) on R&D reported among French firms. This might suggest that although investors perceive intangible assets as value relevant (since it is significantly associated with their decision-making), they are still biased towards its' reporting even during a more stable economic period with better accounting environment. For tangible NCA, across 1999 to 2001 yearly sub-samples show positive significant associations between FNCA

Table 4C: Mean Coefficient Estimates for Regressions of Price (P) on Non-Current Assets Based on Yearly Regressions During Post-Crisis Period

	Exp. Sign	1999	2000	2001
Intercept		1.980***	1.162***	1.256***
INCA _{it}	+	-0.145**	-0.225***	-0.341***
FNCA _{it}	+	0.061*	0.073***	0.051*
IVNCA _{it}	+	-0.056***	-0.059	-0.028
CA _{it}	+	0.045	0.051*	0.071*
TL _{it}	-	0.025***	0.010***	0.017***
EARN _{it}	+	0.258***	0.223***	0.251***
F-value		6.406***	7.007***	9.928***
Adj.R ²		7.58%	10.50%	12.79%
N		396	308	366

*p < 0.10, **p < 0.05, ***p < 0.01

and *P*. On the other hand, the consistent negative sign in the association between IVNCA and *P*, especially significant in 1999, could be due to investors not yet ready for firms to invest more during early economic recovery period.

In summary, variable INCA show negative association with *P* in 11 out of 12 yearly subsamples regressions throughout the three economic periods and accounting environments, with only three significant associations, all during the post-crisis period. Findings show a tendency of different value relevance of intangible assets during the three economic and accounting periods. Before the economic crisis but with less stringent accounting regulation, intangible NCA seemed not to be as value relevant compared to during economic recovery period with a more stringent accounting regulation. It seems that the better the economic period, the less is the value relevance of intangible assets. On the other hand, the better the accounting regulation, the more is the value relevance of intangible assets, but in a negative version of relevance. One explanation could be that even though intangible assets are perceived to be valuable but financial statements users generally see capitalization of intangible assets to be a controversial action (Eckstein, 2004). Financial statement users would probably prefer intangible assets to be expensed rather than capitalized.

Conclusion

This study examines the value relevance of intangible NCA among listed firms in Malaysia. Sample data was divided into three distinct economic and accounting regulatory periods. This study provides evidence that, in general, intangible assets were negatively associated with firms' valuation during all periods, but significant only during years with strong accounting regulation. Findings partly support hypothesis proposed for pre-crisis (i.e. intangible NCA is associated with firms' share prices), and crisis period (i.e. intangible NCA is negatively associated with firms' share prices) but not for post-crisis period (i.e. intangible NCA is positively associated with firms' share prices). During the period of

economic recovery and a more stringent accounting regulation, intangible assets were significant but negatively associated with firms' valuation. Findings suggest intangible assets are value relevant but investors see capitalization of it as controversial.

One possible reason that can explain the consistent negative association between intangible assets and firms' share prices is reported intangible NCA data in this study mainly comprised of goodwill and deferred expenditures (Zaleha et al., 2005a). Even though goodwill is generally found to be value relevant in prior studies (e.g. Muhd-Kamil et al., 2003), recent regulation on goodwill accounting requires firms to focus more on possible impairment rather than its potential growth. For deferred expenditures that are not within R&D, costs is rarely seen as showing significant future cash flow potential to firms.

With Malaysian capital market categorized as among emerging capital markets during the time period of this study, there is also a possibility of the existence of a weak form of the EMH concept. A weak form of EMH could explain why intangible assets are insignificantly associated with firms' share prices, especially during pre-crisis period. A weak form of EMH would suggest that intangible NCA reflected only minimum and uncertain information relevant for firms' valuation. As such, capital market participants would not utilize intangible NCA reporting seriously in their decision on firms' value. During post-crisis period, the existence of a stronger accounting regulatory framework despite the absence of specific intangible assets accounting standard, might explain the significant but negative association between intangible NCA and firms' share prices.

Although this study investigates evidence of value relevance of intangible NCA during different accounting regulatory period, a direct impact of accounting standards on the value relevance of intangible NCA was not established since it is not the scope of this study. Therefore, future research could extend this study by investigating on the value relevance of intangible assets, specifically before and after the issuance of FRS 138, *Intangible Assets*, to provide more insights into the issue of value relevance of reported intangible assets in Malaysia.

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APPENDIX 1

Intangible Assets Accounting Standards Applicable in Malaysia from 1990 to 2001

Time Period	Economic & Accounting Environment	Available accounting standards on intangible NCA	Accounting standards requirements & practice	Predictions on value relevance of intangible NCA
1990 - 1996	<ul style="list-style-type: none"> • Pre-economic crisis • NO accounting REGULATION available at country level 	<ol style="list-style-type: none"> 1. MAS 6 <i>Accounting for Goodwill</i> 2. IAS 9 <i>Research & Development Costs</i> <p>Implementation:</p> <ul style="list-style-type: none"> • MAS 6 applicable only to MIA members • IAS 9 applicable to both MIA and MICPA members 	<ul style="list-style-type: none"> • Goodwill shall be amortized for 25 years. • In practice, goodwill also being kept permanent or fully expensed • R&D – research expenditures fully expensed, development expenditures may be capitalized 	<ul style="list-style-type: none"> • Predicted significant (no specific sign) association between intangible NCA and firms' share prices (due to stable economy but no accounting regulation)
1997 - 1998	<ul style="list-style-type: none"> • Economic crisis • New accounting REGULATION DRAFTED under MASB – available at country level 	<ul style="list-style-type: none"> • Similar accounting standards with pre-crisis period • Process of new accounting regulation may cause unstable implementation for accounting on intangible NCA among practitioners 	<ul style="list-style-type: none"> • Similar with situation during pre-crisis period 	<ul style="list-style-type: none"> • Predicted negative association between intangible NCA and firms' share prices (due to unstable situation overall)
1999 - 2001	<ul style="list-style-type: none"> • Post-economic crisis (recovery period) • Stringent (stable) accounting REGULATION AVAILABLE 	<ol style="list-style-type: none"> 1. MASB 21 <i>Business Combinations</i> 2. MASB 4 <i>Research & Development Costs</i> <ul style="list-style-type: none"> • REGULATION IMPOSED - require listed firms to implement all MASB standards 	<ul style="list-style-type: none"> • Goodwill shall be tested for impairment annually • R&D – research expenditures fully expensed, development expenditures may be capitalized 	<ul style="list-style-type: none"> • Predicted positive association between intangible NCA and firms' share prices (due to stable situation overall)