Capitalised Intangibles and Financial Analysts

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Intellectual Property Research Institute of Australia
Working Paper No. 04/05
ISSN 1447-2317

March 2005

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Abstract

This paper examines whether firms that capitalise a higher proportion of their firm's underlying intangible assets have higher analyst following, lower dispersion of analysts' earnings forecasts and more accurate earnings forecasts relative to firms that capitalise a lower proportion. The study contributes evidence on this issue from the Australian setting where capitalisation of intangible assets is common. Barth et al (2001) and Barron et al (2002) find higher analyst following for firms with higher mostly unrecognized intangible assets. In the Australian setting, we find evidence that suggests managements' accounting choices are instrumental in this relation. The results suggest companies experience relatively higher analyst following, lower forecast dispersion and higher forecast accuracy when the firms underlying intangible assets are sufficiently certain to permit management to capitalise intangible assets.

Keywords: Intangible Assets; Analyst Following; Forecast Dispersion; Forecast Errors.

JEL: M41, G10

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We are grateful to Jack Wong for the data and research assistance, Martin Bugeja for generous access to takeover data, Dan Dhaliwal, David Emanuel, Jennifer Francis, Stephen Penman, Matt Pinnuck, Katherine Schipper, Terry Shevlin, Nasser Spear, and Peter Wells for helpful comments, and to seminar participants at the University of Melbourne, University of Technology, Sydney Summer School, Victoria University, and AAANZ 2002.

1. Introduction

This paper examines whether firms that capitalise a higher proportion of their firm's underlying intangible assets have higher analyst following, lower dispersion of analysts' earnings forecasts and more accurate earnings forecasts relative to firms that capitalise a lower proportion. The study contributes evidence on this issue from a setting where capitalisation of intangible assets is common. This investigation relates to the information asymmetry associated with underlying intangible assets, which has been well documented in the accounting literature.[1] In the US setting, where most intangible assets are unrecognized, it has been shown that the information gap associated with intangible assets provides opportunities for financial analysts to benefit from the application of their expertise (Barth et al 2001; Barron et al 2002). Both these papers show higher analyst following for firms with higher underlying (mostly unrecognized) intangible assets. So far, there is no evidence on the effects of the recognition of intangible assets on this relationship. This paper addresses this gap.

We draw on recent evidence from the Australian setting, which shows that the firm's underlying economics is a first order effect in management's choice to capitalise intangible assets (Wyatt 2005). This evidence indicates that firms capitalising a higher proportion of their firm's underlying intangible assets have less uncertain intangible investments. We expect this will help analysts to distinguish firms with more and less uncertain underlying intangible assets. We therefore hypothesize that capitalisation of intangible assets is associated with higher analyst following. Assuming capitalisation of intangible assets reflects more predictable earnings (relative to firms with less certain underlying intangible assets that do not capitalise), our second hypothesis

[1] See the review by Lev (2001). From a regulatory perspective, the Financial Accounting Standards Board (FASB) considered a project on "enhanced disclosure on intangibles" project that will "consider requiring disclosures about intangible assets that are currently not recognized in financial statements but

predicts that capitalisation of intangible assets is associated with lower earnings forecast dispersion and lower absolute earnings forecast error.

The empirical analysis is conducted in the Australian setting where a range of intangible assets are recorded under Generally Accepted Accounting Principles (GAAP) during our study period 1990-1997, including purchased goodwill, R&D assets, and both acquired and internally generated intangible assets. The unbalanced panel of 421 firm-years comprises companies in the 1990-1997 period that have analyst following and earnings forecast data on BARCEP. Capitalisation of intangible assets (INTANG/MVAD) is measured by the ratio of intangible assets on the balance sheet relative to a proxy variable for total underlying intangible assets. The proxy variable is estimated by deducting the book value of tangible assets from the total market value of equity. Given the endogeneity between the demand and supply of accounting disclosures, the empirical analysis employs a two stage least squares estimation using an instrumental variable approach similar to Frankel et al (2002) (also see Alford and Berger 1999). The hypothesis tests, respectively, regress analyst following, analyst forecast dispersion (standard deviation of the mean forecast), and absolute forecast error, on the capitalisation of intangible variable (INTANG/MVAD), the proxy for underlying intangible assets (MVAD), and variables associated with the analyst variables in prior studies. The analyses are partitioned on the median level of the proxy for the firm's underlying intangible assets (MVAD) since our hypotheses are derived from assumptions about the existence and value of the firms' underlying intangible assets.

The results are consistent with the predicted relations between analyst following (positive), forecast dispersion (negative) and forecast error (negative), and

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would have been recognized as assets if acquired, either separately or in a business combination"

our proxy variable for capitalisation of intangible assets. We obtain additional insights from the partitioning of the analysis on sub-samples of firm-years with different levels of the proxy for the firm's underlying intangible assets.

This study makes a number of important contributions. First, our study extends research on the factors associated with analyst following, earnings forecast dispersion, and accuracy. Barth et al (2001) and Barron et al (2002) find higher analyst following for firms with higher mostly unrecognized intangible assets. In the Australian setting, we find evidence that suggests managements' accounting choices are instrumental in this relation with relatively higher analyst following, and lower forecast dispersion and higher forecast accuracy for companies that are able to capitalise intangible assets.

Prior studies suggest more informative disclosure generally, is associated with analyst behavior and forecasts. Our results confirm this finding in the Australian setting in relation to a specific type of disclosure, the accounting choice to record intangible assets. This insight is of interest to firms wanting to attract analysts and accounting and security regulators concerned about capital market efficiency. The evidence in this paper also speaks to the question posed by Barth et al (2001) of the relation between the ability of financial statements to reflect a firm's underlying economics and analysts' coverage incentives. In a multi-period setting, it is unlikely a policy of recording intangible assets would attract analysts unless intangible assets were value relevant information on average. This evidence is consistent with accounting efficiency and complements several recent studies in the Australian setting that focus on the economics of accounting choice in relation to intangible assets including Ritter and Wells (2005) and Wyatt (2005). Wyatt finds the choice to record intangible assets by Australian managers is associated with the underlying economics

(January 9, 2002).

of the firms. Ritter and Wells (2005) find capitalised identifiable intangible assets are associated with future earnings and market value of the firm. Our evidence investigating the link between the accounting choice to record intangible assets and analyst behavior is consistent with and complements the evidence from these two studies.

Finally, our study, and the evidence from the related studies above, contributes to the regulatory debate surrounding intangible assets. Australia and the European Union have committed to adopt the international accounting standards (IFRS and IAS) on January 1 2005. Adopting these standards will result in a reduction of intangible assets reported on the balance sheet because IAS 38 Intangible Assets and the Australian equivalent, AASB 138, restrict recognition to circumstances where there is an exchange transaction. This will exclude most internally generated intangible assets. Our studies, and those complementary studies above, provide evidence consistent with there being benefits for analysts (and investors) from recognizing intangible assets. The constraints on capitalisation in IAS 38 need to be re-examined in the light of this evidence.

The paper is organised as follows. Section 2 develops the hypotheses. Section 3 describes the research setting and sample. Section 4 reports the empirical analysis and section 5 concludes the study.

2. Hypotheses Development

The prior literature has examined the link between proxies for the level of the firms' underlying intangible assets and analyst following, but not in a setting where firms can capitalise some of the underlying investments. Moreover, the studies have not examined the links from the firms' intangible assets to analysts' earnings forecast

properties.

Consistent with the prior literature, our theory assumes that supply and demand considerations jointly impact the relationship between analyst following and managements' accounting choices to capitalise intangible assets (see Bhushan 1989; Alford and Berger 1999; Frankel, Kothari and Weber 2002). On the demand side, the prior literature suggests these forces will include analysts' incentives to search out information to identify and follow firms expected to perform favorably in the future (McNichols and O'Brien 1997; Francis and Willis 2001). On the supply side, the literature suggests management have "cost of capital" related incentives to supply information that will attract analysts to follow the firm (Trueman 1986).

2.1. Analyst following, properties of analysts' earnings forecasts, and capitalisation of intangible assets

Prior studies show analysts' following is truncated to the firms expected to perform more favorably in the future (McNichols and O'Brien 1997; Francis and Willis 2001). Following "good" firms reduces the risk the analyst will lose underwriting business for their investment bank, or lose broking firm clients, by issuing pessimistic earnings forecasts and "sell" recommendations. To identify "good" firms expected to perform favorably in the future, analysts and their investor clients require information useful for evaluating the firms' expected earnings growth.

The extant literature suggests intangible assets, on average across firms, provide information about expected growth in earnings. Kohlbeck and Warfield (2002) show that including estimates of unrecorded intangible assets in the residual income valuation model improves the models' performance. They attribute this finding to a positive association between the level of the firm's intangible assets and the firm's future abnormal earnings. Similarly, Sougiannis and Yaekura (2001) find biases and

inaccuracies from long (four year) horizon, earnings based valuation models. They attribute these biases, among other things, to accounting conservatism that omits intangible assets information from the balance sheet and earnings forecasts input to the models. Further, in the Australian setting where management has a choice to capitalise intangible assets, it has been shown that management record intangible assets based on their insights into the firm's underlying economics (Wyatt 2005). Consistent with this evidence, Ritter and Wells (2005) show that the reported intangible assets of these Australian companies are significantly positively associated with the firms' future earnings and stock prices.

Taken together, the extant literature suggests that firms capitalising a higher proportion of their firm's underlying intangible assets have less uncertain intangible investments which are more likely to lead to earnings growth. Since analysts prefer firms expected to perform more favourably in the future, we therefore hypothesize that capitalisation of intangible assets relative to the firms' underlying intangible assets is associated with higher analyst following.

H1

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pitalisation of intangible assets relative to total underlying intangible assets is positively related to analyst following.

The evidence from the Australian setting, suggests that capitalisation of intangible assets on average reflects more predictable earnings compared to firms with less certain underlying intangible assets that do not capitalise. Hypothesis two therefore predicts that higher capitalisation of intangible assets relative to underlying intangible assets is associated with lower earnings forecast dispersion and lower

absolute earnings forecast error.

This prediction is in the opposite direction to the United States evidence on the intangible asset link to analyst forecast properties. For a United States sample, Gu and Wang (2003) find a positive relation between forecast errors and the complexity and levels of underlying intangibles. Aboody and Lev (1998) find capitalisers of software development costs have larger analyst forecast errors than the expensing firms.[2] These studies suggest analysts find United States firms' underlying intangible assets, and the capitalisation component of the firms' (in this case software R&D) intangibles, difficult to interpret thereby reducing the accuracy of the analysts' earnings forecasts.

In contrast, intangible assets have always been recognisable on the balance sheet under Australian GAAP. Moreover, capitalisation of intangible assets has become increasingly "routine" since the late 1980s and early 1990s (Wines and Ferguson 1993). Australian managers and analysts will have gained experience in communicating and processing this information, respectively. In fact, it is probable that Australian analysts expect firms with relatively less uncertain intangible investments to signal this fact by capitalising intangible assets. Our second hypothesis therefore predicts that capitalisation of intangible assets relative to the firms' underlying intangibles is associated with lower earnings forecast dispersion and lower absolute earnings forecast error.

H2

Capitalisation of intangible assets relative to total underlying intangible assets is associated with lower analyst earnings forecast error and lower earnings forecast

dispersion.

3. Research Setting and Sample

Table 1 summarises the accounting choice set for intangible assets over the 1990-1997 period of this study.

[PUT TABLE 1 HERE]

Compared to the United States GAAP and International Accounting Standards (IFRS and IAS), recording of intangible assets is common under Australian GAAP. In the study period, there were specific accounting standards only for goodwill (covering internal and purchased goodwill), R&D, and extractive industry exploration and evaluation costs (the latter is not considered in this paper). There was no specific regulation of identifiable intangible assets. Hence, while AASB 1013 Accounting for Goodwill, expressly prohibits recognition of internally generated goodwill, there is no clear demarcation between internally generated goodwill and identifiable intangible assets (Anderson and Zimmer 1992).[3] This provides management with wide discretion to record intangible assets.

The goodwill standard, AASB 1013 *Accounting for Goodwill*, requires capitalisation of purchased goodwill and straight-line amortization over a maximum 20

[2] *SFAS No. 86 Accounting for the Costs of Computer Software to be Sold, Leased, or Otherwise Marketed* appeared in August 1985. Capitalisation is permitted once technological feasibility has been established.

[3] An earlier attempt to regulate separable intangible asset, ED 49 *Accounting for Identifiable Intangible Assets* issued in August 1989, was withdrawn in March 1992 amid torrid debate. ED 49 specifically defined intangibles, as "non-monetary assets without physical substance including but not restricted to brand names, copyrights, franchises, intellectual property, licenses, mastheads, patents and trademarks". Intangibles were to be classified in the financial statements in detail according to these classes (as above) as a minimum acceptable level of disaggregation.

years, with an annual impairment test. The R&D standard, AASB 1011 *Accounting for Research and Development* permits firms the choice to capitalise R&D costs if future benefits are expected to recoup the costs beyond reasonable doubt. Previously expensed R&D cannot be subsequently capitalised and amortization of recorded R&D assets is mandatory once commercial production commences. In the absence of specific standards Statement of Accounting Concepts 4 (SAC 4), guides asset recognition similarly to other jurisdictions: an asset shall only be recognised when (a) it is probable that future economic benefits embodied in the asset will eventuate; and (b) the asset possesses a cost or other value that can be measured reliably. SAC 4 is non-mandatory.

Under this regulatory regime, a wide range of intangible assets appears on the balance sheets of Australian companies including purchased goodwill, internally generated goodwill, internally generated intangible assets, and research and development assets (Wyatt 2005).[4] Wyatt documents that about 68 percent of her sample report intangible assets of some kind although the magnitude of the reported amounts is small on average, a mean (median) of ten (two) percent of total assets. The valuations of intangible assets on corporate balance sheets is closely monitored by the security regulator, the Australian Securities and Investment Commission (ASIC), as part of their on-going *Financial Reporting Surveillance Program.* Companies are required to restate amounts thought by the ASIC to be unreasonable (see the ASIC Annual Report). Existing evidence suggests the firms' underlying economics dominates contracting and signaling motivations for Australian managers' accounting choice to capitalise intangible assets (Wyatt 2005). Taken together, these

[4] Identifiable intangibles capitalised by Australian companies include patents, trademarks, brands, licenses, copyrights, designs, intellectual property, royalties, mastheads, other media and publication intangibles, mineral rights, mining tenements, software, databases, and process technologies (see Wyatt 2005).

characteristics create a unique setting to study issues associated with the choice to capitalise intangible assets. In particular, the decision to capitalise in this setting suggests that management are more confident about their firm's capacity to realize the benefits expected to flow from the underlying intangible investments.

3.1. Sample and data

The sample comprises listed firms with analyst following and earnings forecast data available between 1990 and 1997 on the BARCEP file. These firms are scattered across 23 industries as relationships examined are expected to be relevant across industries. Financial accounting data is obtained from the FINANCIAL ANALYSIS ON CD database. Firms on the BARCEP file are excluded if financial information is not available on the FINANCIAL ANALYSIS ON CD database. Our final sample is an unbalanced panel of 421 annual observations.

[PUT TABLE 2 HERE]

Table 2 Panel A shows the observations per year within the eight-year study period 1990-97 range from 27-79 companies. All firms have positive equity book value and at least three analysts following the firm (see table 4). There are 130 sample firms (31 percent) with no intangible assets on the balance sheet. The mean intangible assets recognized are small (e.g., the mean intangibles/total assets is 0.11 and intangible assets/total assets is 0.02 for the higher and lower underlying intangible asset sub-samples) (see table 4). Hence, consistent with the prior evidence, even with discretion to capitalise intangible assets, a significant number of firms prefer not to capitalise at all and the magnitude of the assets capitalised is small on average.

4. Empirical Analysis

The hypotheses predict a relationship between analyst following, earnings forecast dispersion, and absolute earnings forecast error for the fiscal year, *t*, and capitalisation of intangible assets in the fiscal year *t* balance sheet. The dependent, experimental, and control variables are defined in Table 3.

[PUT TABLE 3 HERE]

4.1. Measurement of the Experimental and Dependent Variables

The experimental variable, INTANG/MVAD, is capitalised intangible assets divided by a proxy for the firm's underlying intangible investments: market value added (MVAD) which is [market value of equity –(book value of equity – intangible assets)]. Chung and Charoenwong (1991) and more recently Cohen, Polk and Vuolteenaho (2001) provide support for the use of this measure of underlying intangible assets.[5] The intangible assets number in the numerator of INTANG/MVAD is the quantum of intangible assets reported on the face of the balance sheet. A positive sign is expected for INTANG/MVAD. The dependent variable to test hypothesis 1, FOLLOW, is the average number of analysts following firm *i* in fiscal year *t*. There are two dependent variables to test hypothesis 2. The first is the natural logarithm of the analysts earnings forecast dispersion deflated by total assets, LG(DISP/TA). Dispersion is measured by the standard deviation of the analysts' earnings forecasts for firm *i* for year *t* scaled by total assets to control for scale effects. The second dependent variable for tests of hypothesis 2 is the absolute forecast error, which comprises the log of the absolute value of earnings minus the mean forecast of earnings scaled by total

[5] Cohen, Polk and Vuolteenaho (2001) decompose cross-sectional variation in firms' book-to-market ratios using both a long United States panel and a shorter international panel. They find 80 percent of transitory cross-sectional variation in expected 15-year stock returns can be explained by expected 15-year profitability and persistence of valuation levels.

assets for firm *i* for the fiscal year *t* (LG(ABS_FE)).[6] A negative sign is expected for the relationship between the two dependent variables, analyst forecast dispersion (LG(DISP/TA)) and analyst forecast error (ABS_FE/TA), and intangible assets relative to market value added (INTANG/MVAD).

4.2. Control Variables

The hypothesis tests include control variables for other factors potentially influencing manager's incentives to capitalise intangible assets, analyst's incentives to follow the firm, and the analysts' earnings forecast dispersion and accuracy.

Level of underlying intangible assets: Ceteris paribus, management's incentives to capitalise intangible assets are affected by the level of the firm's underlying intangible assets. Market value-added deflated by market value of equity (MVAD/MV) is employed as a proxy for variation in the level of the firms' underlying intangible assets. Prior studies have employed market measures to capture the firms' stock of, and investment in, growth opportunities, respectively, (e.g., Smith and Watts 1992) and this approach is adopted in this study.

Expected performance and uncertainty: Ceteris paribus, management's incentives to capitalise intangible assets are affected by the uncertainty associated with the future benefits expected to flow from the underlying investments. Uncertainty arising from financial distress and business risk also influence analyst following, earnings forecast dispersion and forecast error (e.g., Lang and Lundholm 1996; Ang and Ciccone 2000). Ciccone (2001) reports that earnings forecasts for firms with losses and volatile earnings are more likely to exhibit high forecast dispersion and forecast errors. Analyst following is also higher when dispersion and forecast error are lower

[6] Several studies show the mean absolute forecast error is greater for less timely forecasts (Mikhail et al 1997; Clement 1999; Jacob, Lys and Neale 1999; Brown and Mohammad 2001). The forecasts in this

(e.g., Lang and Lundholm 1996; Alford and Berger 1999). We therefore include controls to capture variation in expected future performance and risk. These variables include firm age measured as the number of years listed (AGE), the standard deviation of earnings (EARNSD), and the variance of stock return (σ^2(RET)) calculated as a rolling measure over preceding and current years for each year the firm appears in the sample within the sample period (1990-1997). A firm size measure is also employed, the log of the market value of equity (LOG(MV)), to capture variation in the firms' scale and scope of operations. The earnings of larger firms are less risky than those of smaller firms (e.g., Agarwal and Audretsch 2001). Leverage (LEV) measured as total liabilities divided by book value of equity, captures the potential effects of capital structure and financial risk. Two variables are employed to control for variation in the uncertainty associated with future earnings: an earnings loss variable (LOSS) which is equal to one for firms with earnings losses in the current year and zero otherwise; and the level of operating cash flows to debt (OP/DEBT). To control for managements' incentives to manage earnings in response to prior stock price changes, we employ the change in stock price measured as stock price at time *t* minus stock price at time *t-1* divided by stock price at time *t-1* (ΔPRICE) (see Abarbanelle and Lehavy 2001). Abarbanelle and Lehavy provide evidence that accuracy of forecasts is affected by analysts' failure to forecast earnings management in response to the sign of stock price revisions in prior periods. Finally, industry and year dummy variables control for variation in analyst following and earnings forecasts, and managements' incentives to capitalise intangible assets, due to industry and year specific events (e.g., see Clement 1999).

4.3. Instrumental Variables Estimation

Tests of hypotheses 1 and 2 are based on instrumental variables regressions to

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study are annual averages of the twelve, monthly forecasts.

address the endogeneity in the hypothesized relations. The instrumental variables estimation is obtained from a two stage least squares estimation (2SLS) of a system of equations.

Our theory suggests that:

Firms' have incentives to adopt (supply) a policy of transparent reporting on their underlying intangible investments to attract analysts;

Analysts demand information about the quantum and expected value of the firms' underlying intangible assets to enable the analysts to evaluate the firms' future growth prospects and forecast earnings.

These relationships lead to an endogeneity problem in that the dependent and an independent variable(s) are jointly determined by an existing right hand-side variable. This joint determination phenomenon leads to correlations between the endogenous, right-hand side, predictor variable and the error term of the regression. This correlation violates the independence assumption and leads to biased and inconsistent OLS estimates. This distortion produces biased standard errors of the estimates and significance tests of the regression parameters.

The standard approach to deal with this problem is to employ an instrumental variables regression. To eliminate the correlation between right-hand side variables and the error, we need a set of instrument variables that are both (1) correlated with the explanatory variables in the equation, and (2) uncorrelated with the disturbances (Greene 2000). The instrumental variables estimation, in the first stage, finds the portions of the endogenous and exogenous variables in the prediction model that can be attributed to the instrument(s) in the second equation. The second stage, least squares regression estimates the original prediction equation, but with the variables

replaced by the fitted values from the first-stage regressions. The coefficients of this regression are the consistent estimates that are employed for tests of our predictions.

To test hypotheses 1 and 2, the following three sets of equations are estimated.

Analyst following

$$\text{FOLLOW}_{it}=\sum_{y=90}^{97}\beta_{0Y}\text{YR}_{yit}+\sum_{z=1}^{11}\beta_{10z}\text{INDUSTRY}_{zit}+\beta_{11}\text{fitted(INTANG/MVAD}_{it})+\beta_{12}\text{MVAD/MV}_{it}+$$
$$\beta_{13}\text{OP/DEBT}_{it}+\beta_{14}\text{LOG(MV)}_{it}+\beta_{15}\text{AGE}_{it}+\beta_{16}\text{EARNSD}_{it}+\beta_{17}\text{LOSS}_{it}+\beta_{18}\text{LEV}_{it}$$
$$+\beta_{19}\sigma^2(\text{RET})_{it}+\varepsilon_i \qquad (1)$$

$$\text{INTANG/MVAD}_{it}=\sum_{y=90}^{97}\delta_{0Y}\text{YR}_{yit}+\sum_{z=1}^{11}\delta_{10z}\text{INDUSTRY}_{zit}+\delta_{11}\text{INTANG/TA}_{it}+\delta_{12}\text{MVAD/MV}_{it}+$$
$$\delta_{13}\text{OP/DEBT}_{it}+\delta_{14}\text{LOG(MV)}_{it}+\delta_{15}\text{AGE}_{it}+\delta_{16}\text{EARNSD}_{it}+\delta_{17}\text{LOSS}_{it}+\delta_{18}\text{LEV}_{it}$$
$$+\delta_{19}\sigma^2(\text{RET})_{it}+\eta_i \qquad (2)$$

Analyst forecast dispersion

$$\text{LG(DISP/TA)}_{it}=\sum_{y=90}^{97}\beta_{0Y}\text{YR}_{yit}+\sum_{z=1}^{11}\beta_{10z}\text{INDUSTRY}_{zit}+\beta_{11}\text{Fitted(INTANG/MVAD}_{it})+$$
$$\beta_{12}\text{MVAD/MV}_{it}+\beta_{13}\text{OP/DEBT}_{it}+\beta_{14}\text{LOG(MV)}_{it}+\beta_{15}\text{AGE}_{it}+\beta_{16}\text{EARNSD}_{it}+\beta_{17}\text{LOSS}_{it}+$$
$$\beta_{18}\text{LEV}_{it}+\beta_{19}\sigma^2(\text{RET})_{it}+\varepsilon_i \qquad (3)$$

$$\text{INTANG/MVAD}_{it}=\sum_{y=90}^{97}\delta_{0Y}\text{YR}_{yit}+\sum_{z=1}^{11}\delta_{10z}\text{INDUSTRY}_{zit}+\delta_{11}\text{INTANG/TA}_{it}+\delta_{12}\text{MVAD/MV}_{it}+$$
$$\delta_{13}\text{OP/DEBT}_{it}+\delta_{14}\text{LOG(MV)}_{it}+\delta_{15}\text{AGE}_{it}+\delta_{16}\text{EARNSD}_{it}+\delta_{17}\text{LOSS}_{it}+\delta_{18}\text{LEV}_{it}$$
$$+\delta_{19}\sigma^2(\text{RET})_{it}+\delta_{20}\text{FOLLOW}_{it}+\delta_{21}\Delta\text{PRICE}_{it}+\eta_i \qquad (4)$$

Analyst forecast error

$$\text{LG}(|\text{FE}|/\text{TA})_{it}=\sum_{y=90}^{97}\beta_{0Y}\text{YR}_{yit}+\sum_{z=1}^{11}\beta_{10z}\text{INDUSTRY}_{zit}+\beta_{11}\text{Fitted(INTANG/MVAD}_{it})+$$
$$\beta_{12}\text{MVAD/MV}_{it}+\beta_{13}\text{OP/DEBT}_{it}+\beta_{14}\text{LOG(MV)}_{it}+\beta_{15}\text{AGE}_{it}+\beta_{16}\text{EARNSD}_{it}+\beta_{17}\text{LOSS}_{it}+$$
$$\beta_{18}\text{LEV}_{it}+\beta_{19}\Delta\text{PRICE}_{it},+\beta_{20}\sigma^2(\text{RET})_{it}+\varepsilon_i \qquad (5)$$

$$\sum_{y=90}^{97} \qquad \sum_{z=1}^{11}$$

$$\text{INTANG/MVAD}_{it}=\sum_{y=90}\delta_{0Y}\text{YR}_{yit}+\sum_{z=1}\delta_{10z}\text{INDUSTRY}_{zit}+\delta_{11}\text{INTANG/TA}_{it}+\delta_{12}\text{MVAD/MV}_{it}+$$

$$\delta_{13}\text{OP/DEBT}_{it}+\delta_{14}\text{LOG(MV)}_{it}+\delta_{15}\text{AGE}_{it}+\delta_{16}\text{EARNSD}_{it}+\delta_{17}\text{LOSS}_{it}+\delta_{18}\text{LEV}_{it}$$

$$+\delta_{19}\Delta\text{PRICE}_{it},+\delta_{20}\sigma^2(\text{RET})_{it}+\delta_{21}\text{LG(DISP/TA)}_{it}+\delta_{22}\text{FOLLOW}_{it}+\eta_i \qquad (6)$$

For tests of hypothesis 1, we treat analyst following (FOLLOW) and capitalisation of intangible assets relative to total underlying intangible assets as endogenous. We expect the supply of capitalised intangible assets, and the demand for this information by analysts, is jointly determined by industry and firm characteristics. The variable selected as an instrument for the variation in analyst following that arises from the endogenous relation between FOLLOW and INTANG/MVAD is capitalised intangible assets to total assets (INTANG/TA). As a measure of the firm's asset structure, this variable is correlated with the level of the industry and firm specific factors that are jointly impacting FOLLOW and INTANG/MVAD. An additional condition to estimate the equation system is identification. We satisfy this identification condition by including the right hand side variables that are correlated with the explanatory variables in the equation, and are uncorrelated with the disturbances (Greene 2000, 370-375).[7]

Similarly, for tests of hypothesis 2, we treat analyst dispersion (DISP/TA) and analysts' absolute forecast errors ($|\text{FE}|$/TA), and capitalisation of intangible assets relative to total underlying intangible assets as endogenous because we expect these relations are both jointly determined by industry and firm characteristics. We employ INTANG/TA as the instrument in the second equations (equations (4) and (6)). Equation (4) also includes FOLLOW and stock price change (ΔPRICE) to capture

[7] The specification must satisfy an order condition for identification and rank, which says that there must be at least as many instruments as there are coefficients in the equation (Davidson and MacKinnon 1993; Johnston and DiNardo 1997).

variation in the DISP/TA and INTANG/MVAD relationship that is due to the correlation of INTANG/MVAD and FOLLOW and ΔPRICE. Equation (6) also includes DISP/TA and FOLLOW as instruments to capture variation in the DISP/TA and INTANG/MVAD relationship that is due to the level of dispersion in forecasts and analyst following and not to the decision to report a portion of underlying intangible assets on the balance sheet.

Table 4 provides summary statistics for analyst variables and independent and instrument variables.

[PUT TABLE 4 HERE]

The statistics are partitioned on the median of the proxy for total underlying intangible assets, market value added, deflated by equity market value (MVAD/MV). There are some firms with negative market value added, and with intangible assets comprising a negative multiple of market value added. This is most likely due to falling market value that has preceded the firm's write-down of their intangible assets. The other statistics of interest are the median capitalised intangible assets relative to market value added (INTANG/MVAD) and relative to total assets (INTANG/TA), which are both higher for the above the median MVAD/MV sub-sample of firms.

The "negative–to–positive" variation, in the proxy for the firms' underlying intangible assets, indicates there are obvious sub-samples of firms with very different levels of investments in intangible assets. Given underlying intangible investments is a necessary condition to report "valuable" intangible assets, and this variation is a source of non-linearity in the data, the analyses are conducted on partitions of the deflated proxy for underlying intangible assets as follows: (1) MVAD/MV>0; (2) MVAD/MV> = median MVAD/MV; and (3) MVAD/MV< median MVAD/MV. This stratification

approach offers insights on three sub-sets of companies: the set including firms with the positive market value-added (i.e., (1)), the set in the upper tail of the market value-added distribution in (i.e., (2)), and the set of firms in the lower tail of the market value-added distribution. Given a lack of theory to guide the stratification cut-off points, we investigated median and quartile cut-offs without any new insights.

5. Results

5.1. Primary Results

Table 5 reports Pearson's correlations for the experimental, instrument and control variables for the pooled sample for 1990-97.

[PUT TABLE 5 HERE]

FOLLOW, LG(DISP/TA), and LG(|FE|/TA) correlations with INTANG/MVAD all have the predicted signs (positive, negative and negative respectively). In the higher market value-added table, the instrument variable, INTANG/TA, is significantly correlated with the experimental variable, INTANG/MVAD, as required for the former to be an instrument. In addition, in the higher market value-added table, INTANG/TA has the same signs but lower correlations with the dependent variables compared to INTANG/MVAD. This lower correlation suggests that INTANG/TA is less correlated with the regression disturbances as required. INTANG/TA also has higher correlations with MVAD/MV and INTANG/MVAD in the above the median MVAD/MV compared to the below the median market value-added table (73 percent and 61 percent compared to 18 percent and 3 percent). This result is consistent with there being more intangible assets to total assets for higher market value-added companies per dollar of market value, compared

to the intangible assets per total asset dollar for the lower market value-added companies per dollar of market value. Except for the operating cashflow to debt and earnings standard deviation signs, the signs of the correlations are generally consistent with those from the prior literature and the theory espoused in this paper. Endogenous relations among many (and possible non-linearity among some) of the variables preclude strong inferences from these correlations.

Three regressions are estimated for each of the equations (1)-(3) on partitions of the deflated proxy for underlying intangible assets: (1) MVAD/MV>0; (2) MVAD/MV >= median MVAD/MV; and (3) MVAD/MV< median MVAD/MV. The regressions are estimated for each of the (unbalanced) panel sub-samples pooled over the eight years (1990-97). While an obvious limitation, there are insufficient data observations to run single year regressions including the full set of control variables and industry dummies. Results of additional sensitivity tests are reported in the following section.

Table 6 reports the results for tests of hypothesis 1: the predicted positive association between analyst following and the capitalisation of intangible assets relative to market value-added.

[PUT TABLE 6 HERE]

The regression estimates in table 6 are consistent with the hypothesis that for firms with higher underlying intangible assets, analyst following is higher only when the company reports some of this expected value as intangible assets on the balance sheet. Looking at the center column regression estimates in table 6, which relate to the companies with the highest market value-added (=>the median MVAD/MV), the coefficient estimate for capitalised intangible assets relative to market value-added

(INTANG/MVAD) is positive and significant. However, the coefficient for the level of underlying intangible assets (MVAD/MV) is negative and significant. This evidence is consistent with hypothesis 1. Thus, for firms with higher underlying intangible assets, attracting analyst following is conditional on management's capacity to report some of the expected value in the form of intangible assets on the balance sheet. The other factors attracting analyst following for these "highest market value-added" group of companies include: higher operating cashflows to debt, larger firm size, younger companies in terms of listing year, lower earnings dispersion, and higher leverage suggesting they are established companies.

The result for these "highest market value-added" companies can be contrasted with the hypothesis 1 test for the set of firms with underlying intangible assets below the median MVAD/MV in the last column of table 6. These are less risky companies from the perspective that their asset coalition comprises relatively lower, unrealised growth opportunities. However, they are more risky from a financial performance perspective. For these companies, the proxy for underlying intangible assets, market value-added to market value, is positive and significant in the absence of capitalised intangible assets to support the valuation. This result is consistent with these companies having other characteristics that are informative to analysts about the companies' future prospects. From table 6, these characteristics include higher market value-added relative to their rivals, larger size that brings scale and scope benefits, and lower volatility of stock returns that suggests these companies are less risky. Hence, analyst following is driven by lower operating and equity risk attributes as reflected in firm size and lower stock returns volatility.

The hypothesis 1 results for the set of companies that does not include any negative market value-added companies (MVAD/MV is greater than zero), provides

some additional insights about the factors associated with analyst following. The results for this group of companies are the first set of regression estimates in table 6. Neither capitalised intangible assets nor market value-added is a driver of analyst following for this set of companies. On average these firms have lower underlying intangible assets but not the lowest. For these firms, higher analyst following is observed for firms with higher leverage but also higher operating cashflows to debt suggesting lower financial risk, larger firm size and lower earnings variability suggesting lower operating risk, and lower stock returns volatility.

In summary, the results suggest the riskiness of asset structures for firms in the higher MVAD/MV sub-sample (see Chung and Charoenwong 1991), in the absence of reported intangible assets, places an upper bound on analysts' following incentives. This conjecture is consistent with analyst incentives to follow firms expected to perform well in the future (McNichols and O'Brien 1997; Francis and Willis 2001) and to follow firms for which analysts have the ability to supply services on a cost versus benefit basis (e.g., Frankel et al 2002).

The hypothesis 2 results for analysts' forecast dispersion are reported in table 7.

[PUT TABLE 7 HERE]

The results are consistent with hypothesis 2 and are confined to the set of firms that has less risky stocks of underlying intangible assets. That is, the forecast dispersion is lower for firms reporting intangible assets whose stock of underlying intangibles is not in the lowest or highest distribution of MVAD/MV. Hence, for firms with the very smallest and largest stocks of underlying intangible assets, capitalising intangible assets is not going to attract analyst following. We conjecture this result reflects the risk associated with the firms in the lower and upper tails of the

MVAD/MV distribution. The results for the additional firm characteristics are consistent with this conjecture. For the set of firms that includes those with the highest stock of underlying intangibles (the second set of regression estimates reported in table 7), forecast dispersion is higher if the company has higher operating cashflows to debt, if the firms are smaller, and if they are reporting losses. For these firms, financial features of the firms' performance are dominating any information associated with growth opportunities. In contrast, the set of firms that includes those with the lowest stock of underlying intangibles (the third set of regression estimates reported in table 7), forecast dispersion is higher if the company is smaller, comparatively older in listing year terms, is not reporting losses, and has lower leverage. For this set of "lower stock of intangibles" companies, financial features also dominate any information about growth opportunities. Finally for the set of firms for which capitalised intangible assets and the level of MVAD/MV are instrumental in the level of forecast dispersion (the first set of regression estimates reported in table 7), after these latter effects, forecast dispersion is higher for the firms with higher operating cashflows to debt and lower leverage, smaller firm size, younger age, and if the company reports losses.

In summary, capitalised intangible assets is instrumental in the forecast dispersion-underlying intangible assets relationship only for the "middle of the road" firms. This group comprises those firms whose stock of underlying growth opportunities is not in the lowest or highest level of MVAD/MV. Except for the set of firms including those with MVAD/MV below zero (the third set of regression estimates reported in table 7), the signs of the additional variables are consistent. Hypothesis 2 results for the analyst forecast error tests are reported in table 8.

[PUT TABLE 8 HERE]

The forecast error regression results are similar to those discussed in relation to the forecast dispersion. The main result is that the firms reporting intangible assets have relatively lower earnings forecast errors provided they are not in the upper tail of the MVAD/MV distribution. In the table 7 results, the lack of influence of capitalised intangibles and the MVAD/MV applied to both tails of the MVAD/MV distribution. Hence, the main difference in table 8 compared to the forecast dispersion results in table 7 is for the set of firms with the highest levels of underlying intangible assets (the second set of regression estimates reported in table 8). For this set of companies, financial features dominate any information (capitalised intangible assets or market perceptions of growth opportunities) about growth opportunities. In terms of the stock of intangible assets, these are the riskier firms so it is not surprising that the level of analysts' forecast errors are primarily associated with the firm's financial characteristics—namely, the size of the company, whether the company is reporting losses, the firm's leverage, and the change in the stock price from the prior period.

5.2 Additional Tests

It is possible the results reported in tables 6-8 are driven by analysts' propensity to follow companies making acquisitions and mergers. Where the analyst's firm has dual stock analysis and investment banking functions there is a potential conflict of interest because IPOs, and mergers and acquisitions are much more lucrative than share trading.[8] To evaluate this possibility, models (1)-(3) are rerun with an acquisitions variable: the number of acquisitions the sample firms made in the study period. The results reported in tables 6-8 remain unchanged in these tests.

Additional tests were run using count data models for the analyst following tests (see Rock, Sedo and Willenborg 2001) and ordinary least square tests for the

[8] For example, see http://www.pbs.org/newshour/bb/business/jan-june02/wall_street_2-27.html

forecast dispersion and error hypotheses, and the same primary models (i.e. (1)-(3) but ignoring endogeniety). We also conducted tests using a dummy variable for capitalisation/no capitalisation and different deflators for capitalised intangible assets. These results are generally consistent with the two stage least squares results. However, these tests show highly significant and robust positive relationships between the proxy for the level of underlying intangible assets (MVAD/MV) and analyst following, forecast dispersion and forecast error, which we believe is due to failure to account for the endogeniety among the variables.

In relation to the analyst following count data regressions, after controlling for the level of total underlying intangible assets (using MVAD/MV), neither a dummy variable for capitalisation of intangibles or no capitalisation, nor intangible assets deflated by the alternative deflators, total assets or equity book value (INTANG/TA or INTANG/BVE), was significantly related to analyst following. However, in the count data regressions, the predicted positive, significant relations with analyst following were found for intangible assets deflated by market value added after controlling for the underlying intangible assets (i.e., MVAD/MV). These additional tests of hypothesis 1 indicate that

(1) Analyst following is higher for firms that publicly disclose more information about their firm's intangible assets relative to the firm's level of underlying intangible assets; and
(2) Analyst following is higher for firms with higher levels of underlying intangible assets consistent with Barth et al (2001) and Barron et al (2002).

While the results in (1) are generally consistent with the two stage least square results, we believe the robustness of the latter finding (in (2)) is due to failure to account for endogeniety.

In relation to the forecast dispersion and forecast error tests, additional ordinary

least squares tests suggest a highly significant and robust negative (predicted) result for the capitalisation of intangible asset dummy variable and also intangible assets deflated by total assets (INTANG/TA), but not for intangible assets deflated by market value added (INTANG/MVAD), after controlling for the level of total intangible assets, analyst following and the other control variables (as in the primary tests). We re-ran the two stage least squares regressions with capitalised intangible assets deflated by total assets as the experimental variable and obtained similar results irrespective of the deflator for capitalised intangible assets. So again this effect (i.e., robust positive result with a total assets deflator across all ordinary least squares regressions) appears to be driven by endogenity among the variables, which is mitigated by the two-stage estimation. Overall, the primary results and secondary results are consistent with analysts evaluating capitalised intangible assets relative to underlying intangible assets rather than total assets. We also ran the two stage least squares and ordinary least squares regressions with other firm performance indicators including return on assets and return on shareholders funds with unchanged results.

Annual ordinary least squares regressions for 1990-1997 are also generally consistent with hypotheses 1 and 2 although there are insufficient observations to account for endogeniety effects. Analyst following is positively related to capitalised intangibles relative to market value as predicted in 5 of the 8 years and is significant in 4 of these 5 years. Forecast dispersion and forecast error are negatively related to capitalisation of intangible assets in 7 of the 8 years as predicted and are significant in 5 and 4 of these 7 years, respectively.

6. Conclusion

This paper extends the prior literature on the relation between financial reporting on the firm's unobservable intangible assets and analyst following and earnings forecast properties. The paper examines whether firms that capitalise a higher proportion of their firm's underlying intangible assets have higher analyst following, lower dispersion of analysts' earnings forecasts and more accurate earnings forecasts relative to firms that capitalise a lower proportion. The results are consistent with the hypothesised relations between analyst following (positive), forecast dispersion (negative) and forecast error (negative), and capitalisation of intangible assets relative to total underlying intangible assets.

By stratifying the data panel on sub-samples of firm-years with different levels of the proxy for underlying intangible assets, the analysis provides additional insights about the characteristics of the firms with higher analyst following, and higher analysts' earnings forecast dispersion and errors. Specifically, firms with higher underlying intangible assets exhibit relatively higher analyst following only when the company reports some of this expected value as intangible assets on the balance sheet. This evidence is consistent with hypothesis 1. In the US setting, Barth et al (2001) and Barron et al (2002) find a positive relationship between proxies for total underlying intangible assets and higher analyst following. Our study contributes additional evidence to this literature, suggesting that managements' accounting choices for intangible assets are instrumental in this relation. We conjecture that analysts in the Australian setting are used to processing intangible asset data and expect to see them reported when the properties of the underlying intangibles permit.

The tests also suggest earnings forecast dispersion is lower for firms reporting intangible assets whose stock of underlying intangibles is not in the lowest or highest

distribution of market value added consistent with lower information uncertainty. Similarly, firms reporting intangible assets have relatively lower earnings forecast errors provided they are not in the upper tail of the market value added distribution. For companies in the upper tail of the distribution, financial features dominate any information (capitalised intangible assets or market perceptions of growth opportunities) about growth opportunities. In terms of the stock of intangible assets, these are the riskier firms so it is not surprising that the level of analysts' forecast errors are primarily associated with the firm's financial characteristics (i.e., the size of the company, whether the company is reporting losses, the firm's leverage, and the change in the stock price from the prior period).

This paper thus provides new evidence about the types of information that can predict analyst following, and differences in earnings forecast dispersion and accuracy. The results in this paper suggest capitalised intangible assets differentiate firms with more uncertain underlying intangible assets from those with less uncertain underlying intangible assets (at least in analysts' eyes). This insight is of interest to firms wanting to attract analysts, investors, and accounting and security regulators concerned about capital market efficiency. It has also implication for international standard setters. The Australian adoption of international accounting standards (IFRS and IAS) on January 1 2005 will result in a reduction of intangible assets reported on the balance sheet. The standards, IAS 38 Intangible Assets and the Australian equivalent, AASB 138, will exclude most internally generated intangible assets. The evidence offered in this paper suggests combined with related studies suggest the constraints on capitalisation in IAS 38 need to be re-examined.

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Table 1 Summary of Accounting Methods for Intangible Assets Under Australian GAAP for the 1990-1997 Time Period

Intangible asset categories	Applicable accounting standard	Accounting method choices
Purchased goodwill	AASB 1013 Accounting for Goodwill AASB 1015 Acquisition of Assets	- Capitalise using the purchase method and amortize - Immediately expense if no benefits expected - Annual impairment test
Acquired Identifiable intangible assets	AASB 1015 Acquisition of Assets AASB 1010 Accounting for the Revaluation of Non-Current Assets	- Capitalise at fair value - No specific standard for identifiable intangible assets subsequent to acquisition - No specific amortization requirement in the 1993-97 time period for intangible assets - In the 1993-97 study period upwards and downward revaluations were permitted.[a]
Internally generated Identifiable intangible assets	No specific accounting standard Non-mandatory guidance in SAC 4 (Statement of Accounting Concepts 4) AASB 1010 Accounting for the Revaluation of Non-Current Assets	- Under SAC 4, an asset is future economic benefits controlled by the entity as a result of past transactions or other past events. It permits recognition when (a) it is probable future economic benefits embodied in the asset will eventuate; and (b) the asset possesses a cost or other value that can be measured reliably. - No specific amortization requirement in the 1993-97 time period for intangible assets - In the 1993-97 study period upwards and downward revaluations were permitted.[a]
Research and Development	AASB 1011 Accounting for Research and Development	- Capitalise if benefits expected to exceed costs beyond reasonable doubt, otherwise immediately expense.

Table 2 Summary Statistics

Panel A. Number of sample firms each year and capitalised intangible asset distribution across quintiles

Number of sample firms each year			**Intangibles/Market Value Equity**			**Intangibles/Total Assets**	
Year	*Count*	*Percent*	*Quintiles*	*Firm/Year Frequency*	*Percent*	*Firm/Year Frequency*	*Percent*
90	27	6.41					
91	39	9.26	0.0 - 0.2	369	87.65	384	91.21
92	44	10.45	0.2 - 0.4	27	6.41	18	4.28
93	48	11.40	0.4 - 0.6	10	2.38	11	2.61
94	50	11.88	0.6 - 0.8	7	1.66	8	1.90
95	57	13.54	0.8 – 1.0	8	1.90	0	0.00
96	77	18.29	Total	421	100%	421	100%
97	79	18.76					
Total	421	100.00					

Panel B. Distribution of sample firms across industries (BARCEP Categories)

Industry	Firm/Year Frequencies	Percentage of sample
AUTOMOTIVE MANUFACTURE	2	0.5
BUILDING	26	6.2
CHEMICALS	2	0.5
COMMUNICATIONS	33	7.8
CONGLOMERATES	21	5.0
CONSUMER GOODS	8	1.9
CONTRACTING	10	2.4
DISTRIBUTION	24	5.7
DIVERSE RESOURCES	8	1.9
ELECTRICAL	8	1.9
ENERGY MINING	38	9.0
FINANCIAL	42	10.0
FOOD	31	7.4
GOLD MINING	47	11.2
INFRASTRUCTURE	14	3.3
MACH & EQUIP	15	3.6
METALS	38	9.0
PAPER	12	2.9
PHARMACEUTICALS	5	1.2
PROPERTY	8	1.9
SERVICES	16	3.8
SUNDRY	2	0.5
TRANSPORT	11	2.6
Total	421	100.0

Panel C. Distribution of sample firms across industry classifications employed in tests

	INDUSTRY	Frequency	Percent
1	Financial	43	10.2
2	Energy, Mining, Resources, & Metals	130	30.9
3	Property, Investment, & Conglomerate	29	6.9
4	Manufacturing	93	22.1
5	Services & Contracting	27	6.4
6	Retail, Wholesale, & Distribution	23	5.5
7	Electrical, Electronics, & Automotive	11	2.6
8	Communications	33	7.8
9	Transport	11	2.6
10	Infrastructure & Utilities	14	3.3
11	Pharmaceutical, Chemical, & Biotechnology	7	1.7
	Total	**421**	**100.0**

Table 3 Notation and Measurement of Variables

Variables	Denoted by	Measured as
Dependent variables		
Analyst following	FOLLOW	Average number of analysts following firm *i* for year *t* from BARCEP.
Earnings forecast dispersion	DISP/TA	The standard deviation of analyst earnings forecasts scaled by total assets for firm *i* for year *t* from BARCEP.
Earnings forecast error	$\|FE\|/TA$	The absolute value of earnings minus the mean earnings forecast scaled by total assets for firm *i* for year *t* from BARCEP.
Experimental variable		
Recognized intangible assets relative to market value added	INTANG/MVAD	Intangible assets recognized on the time t balance sheet divided by market value added for firm *i.*
Control Variables		
	Proxy for the level of underlying intangible assets	
Market value added	MVAD/MV	Market value of equity - (book value of equity - intangible assets) reported on the time *t* balance sheet for firm *i* deflated by market value of equity.
	Proxies for expected performance and uncertainty	
Ability to service debt	OP/DEBT	Operating cashflow divided by total liabilities as reported on the time *t* cashflow statement and balance sheet for firm *i.*
Firm size	LOG(MV)	Natural log of market value of equity (calculated using number of ordinary shares and stock price at balance date) for firm *i* for year *t.*
Firm age as life cycle proxy	AGE	Number of years firm *i* has been a listed company
Variability of earnings	EARNSD	Standard deviation of reported earnings of firm *i* over sample period.
Earnings loss	LOSS	Dummy variable equal to one for firms with earnings losses reported on the balance sheet for year *t* and zero otherwise.
Firm age as life cycle proxy	LEV	Total liabilities divided by book value of equity reported on the time *t* balance sheet for firm *i*
Sign and magnitude of prior change in stock price	ΔPRICE	Stock price at time *t* minus stock price at time *t-1* divided by stock price at time *t-1*.
Stock return volatility	σ^2(RET)	Variance of stock return rolling calculation over preceding and current years for each year the firm appears in the sample within the sample period 1990-97

Table 4 Summary Statistics for the Pooled Sample Partitioned on the Median of the Proxy for the Firms' Underlying Intangible Assets (MVAD/MV) (1993-1997)

	MVAD/MV less than median (n=210)					**MVAD/MV greater or equal to the median (n=211)**				
	Mean	*Median*	*Minimum*	*Maximum*	*Std. Dev.*	*Mean*	*Median*	*Minimum*	*Maximum*	*Std. Dev*
FOLLOW	13	14	3	20	4	13	14	4	21	4
DISP/TA	0.004	0.002	0.000	0.034	0.005	0.005	0.002	1.53E-04	0.059	0.008
LG(DISP/TA)	-6.106	-6.033	-9.172	-3.374	1.095	-5.882	-6.031	-8.783	-2.827	0.958
|FE|/TA	0.009	0.002	1.63E-06	0.270	0.024	0.012	0.003	3.72E-05	0.266	0.030
LG(|FE|/TA)	-6.39	-6.17	-13.33	-1.31	1.95	-5.819	-5.848	-10.198	-1.323	1.657
Intangibles/MVAD	0.18	0.005	-6.74	15.42	1.27	0.19	0.05	0.00	2.06	0.30
Intangibles/TA	0.02	0.004	0.00	0.23	0.03	0.11	0.03	0.00	0.78	0.18
MVAD/MV	0.14	0.27	-1.39	0.45	0.34	0.68	0.62	0.46	4.02	0.30
OP/DEBT	0.20	0.11	-0.08	2.21	0.33	0.22	0.17	-0.33	1.56	0.25
MV	2,501m	880m	48m	21,063m	3,666m	2,815m	1,319m	135m	30,365m	4,643m
LOG(MV)	6.97	6.78	3.87	9.96	1.36	7.24	7.18	4.90	10.32	1.14
AGE (in years)	21	18	3	87	16	22	13	3	87	22
EARNSD	113.52	28.92	0.00	748.27	201.87	50.65	23.61	0.00	632.93	99.53
LEV	0.52	0.50	0.09	0.96	0.21	0.50	0.51	0.09	0.95	0.16
Δ(PRICE)	-0.04	0.00	-2.02	0.95	0.40	0.05	0.06	-1.74	0.68	0.30
σ^2(RET)	00.18	0.06	0.00	1.71	0.32	0.12	0.05	0.00	2.08	0.26
Dichotomous Variables										
Loss firms [no loss firms]	10 firm-years (5%) [200 firm-years (95%)]					6 firm-years (3%) [205 firm-years (97%)]				
Capitalisers [non-capitalisers]	134 firm-years (64%) [76 firm-years (36%)]					157 firm-years (74%) [54 firm-years (26%)]				

FOLLOW is the average number of analysts following firm *i* for year *t;* LG(DISP/TA) is natural log of DISP/TA the standard deviation of analysts earnings forecasts scaled by total assets for firm *i* for year *t*; LG(|FE|/TA) the natural log of |FE|/TA the absolute value of earnings minus the mean earnings forecast scaled by total assets for firm *i* for year *t;* INTANG/MVAD (or INTANG/TA) is capitalised intangible assets divided by market value added (or total assets) for firm *i* for year *t*; MVAD equals market value equity (calculated using balance date ordinary shares and stock price) minus book value equity which has intangible assets subtracted for firm *i* for year *t*; MVAD/MV is market value added divided by equity market value for firm *i* for year *t*; OP/DEBT is operating cash divided by total liabilities for firm *i* for year *t*; LOG(MV) is natural log of market value equity for firm *i* for year *t*; AGE is the number of years firm *i* has been listed; EARNSD is the standard deviation of reported earnings of firm *i* over sample period; LEV is total liabilities divided by book value of equity; Δ(PRICE) is stock price at time *t* minus stock price at time *t-1* divided by stock price at time *t-1;* σ^2(RET) equals the variance of stock return rolling calculation over preceding and current years for each year the firm appears in the sample within the sample period 1990-97; LOSS is a dummy variable equal to one for firms with earnings losses for year *t* and zero otherwise.

Table 5 Pearson's correlations for the pooled data partitioned on the median of the proxy for the firms' underlying intangible assets relative to market capitalisation (MVAD/MV) (1993-1997)

MVAD/MV greater than or equal to the median (n=211)

	FOLLOW	LG(DISP/TA)	LG(|FE|/TA)	INTANG/ MVAD	INTANG/ TA	MVAD/ MV	OP_DEBT	LOG(MV)	AGE	EARN_SD	LEV	ΔPRICE
LG(DISP/TA)	-0.28											
LG(|FE|/TA)	-0.39	0.65										
INTANG/MVAD	0.13	-0.27	-0.21									
INTANG/TA	0.04	-0.15	-0.08	0.73								
MVAD/MV	0.06	-0.07	-0.05	0.61	0.58							
OP_DEBT	-0.01	0.38	0.24	-0.27	-0.14	-0.01						
LOG(MV)	0.56	-0.63	-0.65	0.02	-0.05	-0.01	-0.19					
AGE	0.11	-0.07	-0.06	-0.01	-0.09	-0.11	-0.12	0.11				
EARN_SD	0.27	-0.38	-0.36	0.30	-0.05	0.21	-0.19	0.55	-0.01			
LEV	0.30	-0.58	-0.50	0.15	-0.08	0.11	-0.36	0.45	0.06	0.43		
ΔPRICE	-0.02	0.00	0.08	-0.37	-0.21	-0.33	0.19	0.09	0.04	-0.09	-0.02	
σ^2(RET)	-0.01	0.12	0.07	0.31	0.13	0.55	-0.08	-0.08	-0.05	0.27	-0.10	-0.25

MVAD/MV less than the median (n=210)

	FOLLOW	LG(DISP/TA)	LG(|FE|/TA)	INTANG/ MVAD	INTANG/ TA	MVAD/ MV	OP_DEBT	LOG(MV)	AGE	EARN_SD	LEV	ΔPRICE
LG(DISP/TA)	-0.26											
LG(|FE|/TA)	-0.41	0.62										
INTANG/MVAD	0.11	-0.07	-0.03									
INTANG/TA	0.07	-0.10	-0.11	0.18								
MVAD/MV	0.27	0.03	0.09	0.03	0.19							
OP_DEBT	-0.08	0.42	0.28	0.01	-0.05	0.14						
LOG(MV)	0.63	-0.62	-0.73	0.03	0.01	0.10	-0.34					
AGE	0.18	0.12	0.01	0.10	-0.10	0.10	0.03	0.09				
EARN_SD	0.37	-0.62	-0.57	0.01	-0.14	-0.15	-0.24	0.67	-0.02			
LEV	0.25	-0.74	-0.54	0.08	0.01	-0.10	-0.51	0.48	-0.011	0.67		
ΔPRICE	-0.01	-0.19	-0.06	0.06	0.05	0.21	-0.03	0.13	0.06	0.00	0.12	
σ^2(RET)	-0.13	0.12	-0.03	-0.01	-0.04	-0.27	-0.00	0.03	-0.03	0.20	-0.13	-0.31

INTANG/MVAD (or INTANG/TA) equals capitalised intangible assets divided by market value added (or total assets) for firm *i* for year *t*; FOLLOW is the average number of analysts following firm *i* for year *t;* DISP/TA is the standard deviation of analysts earnings forecasts scaled by total assets for firm *i* for year *t;* LG(DISP/TA) is natural log of DISP/TA; |FE|/TA is the absolute value of earnings minus the mean earnings forecast scaled by total assets for firm *i* for year *t;* LG(|FE|/TA) the natural log of |FE|/TA; MVAD equals market value equity (calculated using balance date ordinary shares and stock price) minus book value equity which has intangible assets subtracted for firm *i* for year *t*; MVAD/MV equals market value added divided by equity market value for firm *i* for year *t*; OP/DEBT is operating cash divided by total liabilities for firm *i* for year *t*; LOG(MV) is natural log of market value equity for firm *i* for year *t*; AGE is the number of years firm *i* has been listed; EARNSD is the standard deviation of reported earnings of firm *i* over sample period; LEV is total liabilities divided by book value of equity; Δ(PRICE) is equal to stock price at time *t* minus stock price at time *t-1* divided by stock price at time *t-1;* σ^2(RET) equals the variance of stock return rolling calculation over preceding and current years for each year the firm appears in the sample within the sample period 1990-97.

Table 6
Two stage ordinary least squares regressions of analyst following (FOLLOW) on capitalised intangible assets relative to a proxy for total underlying intangible assets (INTANG/MVAD) and proxies for other factors found to affect the level of analyst following for the pooled (1990-1997) sub-samples

$$FOLLOW_{it}=\sum_{y=90}^{97}\beta_{0Y}YR_{yit}+\sum_{z=1}^{11}\beta_{10z}INDUSTRY_{zit}+\beta_{11}\text{fitted}(INTANG/MVAD_{it})+\beta_{12}MVAD/MV_{it}+\beta_{13}OP/DEBT_{it}+$$
$$\beta_{14}LOG(MV)_{it}+\beta_{15}AGE_{it}+\beta_{16}EARNSD_{it}+\beta_{17}LOSS_{it}+\beta_{18}LEV_{it}+\beta_{19}\sigma^2(RET)_{it}+\varepsilon_i \quad (1)$$

$$INTANG/MVAD_{it}=\sum_{y=90}^{97}\delta_{0Y}YR_{yit}+\sum_{z=1}^{11}\delta_{10z}INDUSTRY_{zit}+\delta_{11}INTANG/TA_{it}+\delta_{12}MVAD/MV_{it}+\delta_{13}OP/DEBT_{it}+$$
$$\delta_{14}LOG(MV)_{it}+\delta_{15}AGE_{it}+\delta_{16}EARNSD_{it}+\delta_{17}LOSS_{it}+\delta_{18}LEV_{it}+\delta_{19}\sigma^2(RET)_{it}+\eta_i \quad (2)$$

Independent Variables	Predicted sign	**MVAD/MV greater than zero** (n=378)	**MVAD/MV greater than or equal to the median** (n=211)	**MVAD/MV less than the median** (n=210)
$INTANG/MVAD_{it}$	+	1.027	**4.757**	0.780
		(1.34)	**(3.04)****	(1.29)
$MVAD/MV_{it}$	+	-0.362	**-2.785**	**1.815**
		(-0.76)	**(-2.73)****	**(2.55)****
$OP/DEBT_{it}$	+/-	**2.342**	**4.684**	1.002
		(2.85)**	**(4.80)****	(1.03)
$LOG(MV)_{it}$	+	**2.062**	**1.840**	**1.941**
		(12.94)**	**(7.64)****	**(9.11)****
AGE_{it}	+	0.006	**0.014**	-0.006
		(0.849)	**(1.89)***	(-0.49)
$EARNSD_{it}$	-	**-0.004**	**-0.007**	0.001
		(-2.90)**	**(-2.47)****	(0.25)
$LOSS_{it}$	-	-0.036	-1.248	-0.436
		(-0.05)	(-1.02)	(-0.47)
LEV_{it}	+/-	**4.124**	**8.669**	0.823
		(2.57)**	**(4.56)****	(0.37)
$\sigma^2(RET)_{it}$	-	**-1.286**	0.166	**-2.629**
		(-1.85)*	(0.17)	**(-3.45)****
Constant		-1.870	-2.636	0.068
		(-1.16)	(-1.35)	(0.03)
F-statistic (prob.)		17.997 (0.00)	11.160 (0.00)	14.512 (0.00)
Adjusted R^2		0.52	0.57	0.61

INTANG/MVAD (or INTANG/TA) equals capitalised intangible assets divided by market value added (or total assets) for firm *i* for year *t*; FOLLOW is the average number of analysts following firm *i* for year *t;* MVAD equals market value equity (calculated using balance date ordinary shares and stock price) minus book value equity which has intangible assets subtracted for firm *i* for year *t*; MVAD/MV equals market value added divided by equity market value for firm *i* for year *t*; OP/DEBT is operating cash divided by total liabilities for firm *i* for year *t*; LOG(MV) is natural log of market value equity for firm *i* for year *t*; AGE is the number of years firm *i* has been listed; EARNSD is the standard deviation of reported earnings of firm *i* over sample period; LOSS is a dummy variable equal to one for firms with earnings losses for year *t* and zero otherwise; LEV is total liabilities divided by book value of equity; σ^2(RET) equals the variance of stock return rolling calculation over preceding and current years for each year the firm appears in the sample within the sample period 1990-97. Reported are coefficients, t-statistics, one tail probability where there is a signed prediction and two tail probability otherwise: probability <0.05; * probability <0.01**).

Table 7
Two stage ordinary least squares regressions of analyst average fiscal year forecast dispersion for firm *i* (LG(DISP/TA)) on capitalised intangible assets relative to total underlying intangible assets (INTANG/MVAD) and proxies for other factors found to affect analyst forecast dispersion for the pooled (1990-1997) sub-samples

$$LG(DISP/TA)_{it}=\sum_{y=90}^{97}\beta_{0Y}YR_{yit}+\sum_{z=1}^{11}\beta_{10z}INDUSTRY_{zit}+\beta_{11}Fitted(INTANG/MVAD_{it})+\beta_{12}MVAD/MV_{it}+$$

$$\beta_{13}OP/DEBT_{it}+\beta_{14}LOG(MV)_{it}+\beta_{15}AGE_{it}+\beta_{16}EARNSD_{it}+\beta_{17}LOSS_{it}+\beta_{18}LEV_{it}+\beta_{19}\sigma^2(RET)_{it}+\varepsilon_i \quad (3)$$

$$INTANG/MVAD_{it}=\sum_{y=90}^{97}\delta_{0Y}YR_{yit}+\sum_{z=1}^{11}\delta_{10z}INDUSTRY_{zit}+\delta_{11}INTANG/TA_{it}+\delta_{12}MVAD/MV_{it}+\delta_{13}OP/DEBT_{it}+$$

$$\delta_{14}LOG(MV)_{it}+\delta_{15}AGE_{it}+\delta_{16}EARNSD_{it}+\delta_{17}LOSS_{it}+\delta_{18}LEV_{it}+\delta_{19}\sigma^2(RET)_{it}+\delta_{20}FOLLOW_{it}+\delta_{21}\Delta PRICE_{it}+\eta_i \quad (4)$$

Independent Variables	Predicted sign	**MVAD/MV greater than zero** (n=378)	**MVAD/MV greater than or equal to the median** (n=211)	**MVAD/MV less than the median** (n=210)
$INTANG/MVAD_{it}$	-	**-0.299**	-0.039	-0.072
		(-1.81)*	(-0.13)	(-0.56)
$MVAD/MV_{it}$	+	**0.282**	0.063	0.123
		(2.16)*	(0.27)	(0.61)
$OP/DEBT_{it}$	+/-	**2.342**	**0.414**	-0.050
		(2.85)**	**(2.28)***	(-0.31)
$LOG(MV)_{it}$	-	**-0.311**	**-0.345**	**-0.244**
		(-9.05)**	**(-6.64)****	**(-5.02)****
AGE_{it}	+/	**0.004**	0.002	**0.007**
		(2.26)*	(1.05)	**(2.49)****
$EARNSD_{it}$	+	-0.001	-0.001	-0.001
		(-1.47)	(-0.53)	(-0.99)
$LOSS_{it}$	+	**0.690**	**1.471**	**-2.120**
		(3.19)**	**(9.10)****	**(-4.17)****
LEV_{it}	+/-	**-1.159**	-0.663	**-2.120**
		(-3.31)**	(-1.80)	**(-4.17)****
$\sigma^2(RET)_{it}$	+	0.047	-0.096	0.175
		(0.33)	(-0.63)	(1.11)
Constant		**-3.565**	**-3.475**	**-3.437**
		(-11.023)**	**(-7.16)****	**(-5.92)****
F-statistic (prob.)		37.571 (0.00)	24.385 (0.00)	24.595 (0.00)
Adjusted R^2		0.71	0.74	0.75

INTANG/MVAD (or INTANG/TA) equals capitalised intangible assets divided by market value added (or total assets) for firm *i* for year *t*; LG(DISP/TA) is the natural log of DISP/TA the standard deviation of analysts earnings forecasts scaled by total assets for firm *i* for year *t*; FOLLOW is the average number of analysts following firm *i* for year *t;* Δ(PRICE) is equal to stock price at time *t* minus stock price at time *t-1* divided by stock price at time *t-1;* MVAD equals market value equity (calculated using balance date ordinary shares and stock price) minus book value equity which has intangible assets subtracted for firm *i* for year *t*; MVAD/MV equals market value added divided by equity market value for firm *i* for year *t*; OP/DEBT is operating cash divided by total liabilities for firm *i* for year *t*; LOG(MV) is natural log of market value equity for firm *i* for year *t*; AGE is the number of years firm *i* has been listed; EARNSD is the standard deviation of reported earnings of firm *i* over sample period; LOSS is a dummy variable equal to one for firms with earnings losses for year *t* and zero otherwise; LEV is total liabilities divided by book value of equity; σ^2(RET) equals the variance of stock return rolling calculation over preceding and current years for each year the firm appears in the sample within the sample period 1990-97. Reported are coefficients, t-statistics, and one tail probability where there is a signed prediction and two tail probability otherwise: probability <0.05; * probability <0.01**).

Table 8
Two stage ordinary least squares regressions of analyst average fiscal year absolute forecast error for firm *i* (LG(|FE|/TA)) on capitalised intangible assets relative to total underlying intangible assets (INTANG/MVAD) and proxies for other factors found to affect analyst forecast error for pooled (1990-1997) sub-samples

$$LG(|FE|/TA)_{it}=\sum_{y=90}^{97}\beta_{0Y}YR_{yit}+\sum_{z=1}^{11}\beta_{10z}INDUSTRY_{zit}+\beta_{11}Fitted(INTANG/MVAD_{it}) + \beta_{12}MVAD/MV_{it}+\beta_{13}OP/DEBT_{it}$$
$$+ \beta_{14}LOG(MV)_{it} + \beta_{15}AGE_{it} + \beta_{16}EARNSD_{it} + \beta_{17}LOSS_{it} + \beta_{18}LEV_{it} + \beta_{19}\Delta PRICE_{it,} + \beta_{20}\sigma^2(RET)_{it} + \varepsilon_i \quad (5)$$

$$INTANG/MVAD_{it}=\sum_{y=90}^{97}\delta_{0Y}YR_{yit}+\sum_{z=1}^{11}\delta_{10z}INDUSTRY_{zit}+ \delta_{11}INTANG/TA_{it}+\delta_{12}MVAD/MV_{it}+ \delta_{13}OP/DEBT_{it} +$$
$$\delta_{14}LOG(MV)_{it}+ \delta_{15}AGE_{it}+\delta_{16}EARNSD_{it} + \delta_{17}LOSS_{it} + \delta_{18}LEV_{it} + \delta_{19}\Delta PRICE_{it,} + \delta_{20}\sigma^2(RET)_{it} +$$
$$\delta_{21}LG(DISP/TA)_{it} + \delta_{22}FOLLOW_{it} + \eta_i \quad (6)$$

Independent Variables	Predicted sign	**MVAD/MV greater than zero** (n=378)	**MVAD/MV greater than or equal to the median** (n=211)	**MVAD/MV less than the median** (n=210)
$INTANG/MVAD_{it}$	-	**-1.099**	-0.530	**-0.822**
		(-2.37)**	(-0.76)	**(-1.73)***
$MVAD/MV_{it}$	+	**0.681**	0.211	**1.023**
		(1.71)*	(0.36)	**(2.02)***
$OP/DEBT_{it}$	+/-	-0.343	-0.302	-0.551
		(-0.83)	(-0.63)	(-1.15)
$LOG(MV)_{it}$	-	**-0.924**	**-0.886**	**-0.987**
		(-10.35)**	**(-8.33)****	**(-7.37)****
AGE_{it}	-	0.004	0.002	0.010
		(0.78)	(0.36)	(1.12)
$EARNSD_{it}$	+	-1.41E-05	0.001	0.001
		(-0.01)	(0.63)	(0.73)
$LOSS_{it}$	+	-0.299	**0.574**	-0.091
		(-0.81)	**(1.63)***	(-0.19)
LEV_{it}	+/-	**-1.078**	**-1.369**	**-2.918**
		(-1.73)*	**(-1.91)***	**(-2.86)****
$\Delta PRICE_{it}$	+/-	0.384	**0.863**	0.197
		(1.16)	**(2.51)***	(0.43)
$\sigma^2(RET)_{it}$	+	0.028	-0.150	0.038
		(0.05)	(-0.48)	(0.05)
Constant		0.657	0.509	**2.527**
		(0.84)	(0.59)	**(1.92)***
F-statistic (prob.)		11.347 (0.00)	10.082 (0.00)	7.029 (0.00)
Adjusted R^2		0.29	0.54	0.27

INTANG/MVAD (or INTANG/TA) equals capitalised intangible assets divided by market value added (or total assets) for firm *i* for year *t*; LG(|FE|/TA) the natural log of |FE|/TA the absolute value of earnings minus the mean earnings forecast scaled by total assets for firm *i* for year *t;* LG(DISP/TA) is natural log of DISP/TA the standard deviation of analysts earnings forecasts scaled by total assets for firm *i* for year *t;* FOLLOW is the average number of analysts following firm *i* for year *t;* Δ(PRICE) is equal to stock price at time *t* minus stock price at time *t-1* divided by stock price at time *t-1;* MVAD equals market value equity (calculated using balance date ordinary shares and stock price) minus book value equity which has intangible assets subtracted for firm *i* for year *t*; OP/DEBT is operating cash divided by total liabilities for firm *i* for year *t*; LOG(MV) is natural log of market value equity for firm *i* for year *t*; AGE is the number of years firm *i* has been listed; EARNSD is the standard deviation of reported earnings of firm *i* over sample period; LOSS is a dummy variable equal to one for firms with earnings losses for year *t* and zero otherwise; LEV is total liabilities divided by book value of equity; σ^2(RET) equals the variance of stock return rolling calculation over preceding and current years for each year the firm appears in the sample within the sample period 1990-97. Reported are coefficients, t-statistics, and one tail probability where there is a signed prediction and two tail probability otherwise: probability <0.05; * probability <0.01**).