COVER SHEET

Is Older Goodwill Value Relevant?

Martin Bugeja
University of Sydney

Natalie Gallery*
Queensland University of Technology

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**Corresponding author:*
Professor Natalie Gallery, School of Accountancy, Queensland University of Technology, GPO Box 2434, Brisbane, Queensland 4001 Australia, Telephone: +61 7 3138 4320, Email: n.gallery@qut.edu.au

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Abstract

Although prior research has generally found that goodwill reported in firms' financial reports is relevant to equity valuation, no known studies have directly examined whether the value-relevance of purchased goodwill holds as it ages. We examine this issue in the Australian context to determine whether the market attaches different values to the components of Australian firms' goodwill when it is disaggregated into different 'ages'. Our results suggest that recently acquired goodwill has information content whereas 'older' goodwill does not. Our findings have implications for goodwill accounting practice and recent changes to goodwill accounting standards.

1. INTRODUCTION

Accounting for goodwill has long been the subject of debate with regard to both whether purchased goodwill is an asset that should be recognised on balance sheet and, when it is recognised, how it should be amortised. Accounting researchers have attempted to empirically test the extent to which the recorded goodwill asset is relevant to the valuation of equity by market participants. Prior studies have consistently found a positive association between firm value and goodwill in both the U.S. (see for example Jennings, Robinson, Thompson and Duvall, 1996) and Australia (see Barth & Clinch, 1996; Godfrey & Koh, 2001). However, Jennings *et al*. (1996) and Henning, Lewis and Shaw (2000) suggest that investors are likely to attach different valuation weights on various components of the total goodwill asset amount, including differentiation in the value relevance of goodwill of different 'ages'. That is, goodwill may be strongly associated with expected future benefits in the period the acquisition is recorded, but is likely to diminish rapidly thereafter (Jennings *et al*., 1996). Although Jennings *et al*. (1996) find no significant differential effect between values attached to recently acquired goodwill and 'older' goodwill,[1] this issue warrants further investigation, particularly in light of the recent changes to U.S., International and Australian accounting standards requiring annual impairment testing of goodwill, rather than systematic amortisation.

The objective of this study is to examine whether the market attaches different values to the components of recognised goodwill when it is disaggregated into different 'ages'. We find that firm value is positively associated with goodwill purchased in the observation year and in each of the prior two years, but not with goodwill acquired more than two years previously. Our findings suggest that only recently acquired goodwill is associated with the market value

[1] Jennings *et al*. (1996) acknowledge that not finding differences in the value of different ages of goodwill may be attributable to self-selection bias in their sample.

of equity, which indicates that the market perceives 'older' goodwill as not having future economic benefits.

A possible explanation for this finding is that over time, the benefits of an acquisition are increasingly reflected in normal operations and therefore, the value is captured in earnings, rather than the goodwill asset. Consider, for example, the acquisition of Southcorp Ltd by Foster's Group Ltd in 2005. Foster's recognised substantial goodwill ($1,548 million) on acquisition and indicated that expected synergies from the purchase will range between $270 and $310 million in the following three years.[2] Substantial cost-cutting with the sale of two wineries announced shortly after the acquisition, however, implies that some of the unidentified benefits of the acquisition originally recognised as goodwill will subsequently be reflected through income as cost savings. In these circumstances it is possible that the market will price the earnings-reflected benefit, but not the related goodwill, once the earnings effect is reported. An alternative explanation for our findings may be found in the takeover literature, which provides evidence that firms generally fail to achieve post-merger improvements in performance; our results may reflect the market discounting the value of goodwill when it becomes evident the acquisition has not added value.

The remainder of this paper is organised as follows. Section 2 provides background on the accounting for goodwill issue. Prior research that leads to our research question is presented in Section 3. The research method used to empirically investigate the research question, results of statistical tests and analyses are presented in Section 4, followed by a conclusion in Section 5.

[2] Foster's Group Full Year Results Presentation announced to the Australian Stock Exchange on 30 August 2005.

2. BACKGROUND ON ACCOUNTING FOR GOODWILL

Accounting for goodwill is a controversial topic. Controversy centres firstly on whether goodwill (both purchased and internally generated) should be recognised as an asset and then secondly, if goodwill is recorded as an asset, whether the amount recognised should be subject to amortisation.

Prior to January 2005, accounting for goodwill in Australia was prescribed by AASB 1013 *Accounting for Goodwill*. Goodwill is defined as the "future benefits from assets that are not capable of being both individually identified and specifically recognised" (AASB 1013, para. 13). Purchased goodwill, measured as the excess of the cost of acquisition over the fair value of the identifiable net assets acquired (para. 5.7), is recognised as a non-current asset at the time of acquisition (para. 5). AASB 1013 required amortisation of this amount over a period not exceeding 20 years on a straight-line basis (para. 5.2). The balance of goodwill was required to be reviewed annually and written down to the extent that future economic benefits were no longer probable (para. 5.4).

With the adoption of standards issued by the International Accounting Standards Board (IASB) from 1 January 2005, Australian companies must now follow the requirements of AASB 3 *Business Combinations*. Consistent with IFRS 3 *Business Combinations*, the Australian standard no longer provides for regular goodwill amortisation but requires firms to adopt an annual impairment test in accordance with AASB 136 *Impairment of Assets* (AASB 3, para. 55). Under these new standards, purchased goodwill is allocated to "cash-generating units", which comprise the smallest identifiable groups of assets from which cash inflows can be separately identified. Goodwill allocated to each cash-generating unit is tested annually for impairment by comparing the recoverable amount of the unit with its carrying amount; if the recoverable amount is lower than the carrying amount, then the goodwill is written down and a goodwill impairment loss is recognised (AASB 136, para. 104).

This change to Australian and International goodwill accounting follows in the footsteps of changes made by the Financial Accounting Standards Board (FASB) to U.S. standards. However, the U.K Financial Reporting Standard 10 *Goodwill and Intangible Assets* continues to require amortisation of purchased goodwill, with a maximum amortisation period of 20 years. The useful life may be determined as greater than 20 years if it is expected that the durability of the acquired business will exceed 20 years and the value of goodwill can be regularly measured.

Remaining variation between the U.K. and other jurisdictions in approaches to goodwill accounting subsequent to acquisition reflects the problematic nature of this asset. Purchased goodwill is not directly observable post-acquisition and therefore any estimate of the amount of goodwill lacks validity because it will vary according to operational and economic circumstances, strategic decisions and various other factors (Tollington, 1998). While total goodwill can be determined post-acquisition as the difference between the fair value of a firm's identifiable net assets and the market value of the firm, segregating this calculated amount between purchased and internally generated goodwill becomes an arbitrary allocation process. Impairment testing under U.S./international standards obviates the need to estimate a 'value' for purchased goodwill post-acquisition, but it effectively results in recognition of internally generated goodwill and/or benefits associated with undervalued book values of tangible assets. Perhaps the only way of verifying that recognised goodwill continues to represent economic value after acquisition is to test whether it is priced by the market in subsequent years.

3. PRIOR LITERATURE AND RESEARCH QUESTION

Prior research has examined the information content of purchased goodwill to evaluate whether it should be recorded as an asset on the balance sheet. If the market judges that the

reported amount of goodwill reflects future economic benefits, then there should be a significant positive relationship between goodwill and the firm's market value of equity. Prior value relevance studies have consistently found that goodwill is priced as an asset by investors. In one of the earliest studies, Chauvin and Hirschey (1994) find consistently positive associations between goodwill and firm value, although this relationship holds only for firms in the manufacturing sector. The positive relationship between goodwill and firm value is further corroborated in subsequent studies by McCarthy and Schneider (1995) and Jennings, Robinson, Thompson and Duvall (1996). Hirschey and Richardson (2002) adopt an event-study approach, rather than a balance sheet model, to examine the relationship between goodwill write-offs and firm value as an alternative test of the information content of accounting goodwill numbers. They find evidence of negative valuation effects tied to goodwill write-off announcements, consistent with market participants viewing goodwill as representing economic value.

Johnson and Petrone (1998) argue that given the method for calculating purchased goodwill, it can be disaggregated into various components. These components include: the difference between the fair value of the acquiree's assets (including unrecognised assets) and their book value, synergistic benefits of the acquisition, the acquiree's internally generated goodwill and overpayment by the bidder. Henning, Lewis and Shaw (2000) use the Johnson and Petrone (1998) framework to investigate whether investors attach different valuation weights to the various components of goodwill; they find a significant positive association between market values and the going concern and synergy components of goodwill, and a negative relationship with the overpayment/overvaluation component.

A relationship between the goodwill asset and firm value has also been found in the context of research investigating the effects of differences in international accounting methods. In a study of the value relevance of the reconciliation between US GAAP and non-US GAAP

earnings and shareholders equity provided on Form 20-F, Amir, Harris and Venuti (1993) find that the reconciling item for goodwill is positively associated with a firms' market-to-book ratio, consistent with investors regarding goodwill as an asset.[3] In their study of the value relevance of disclosures reconciling goodwill to US GAAP for non-US firms, Barth and Clinch (1996) find the disclosures for UK firms are value relevant, even though goodwill is disclosed in the notes, rather than recognised. The value relevance of the recognised goodwill asset has also been found in the context of studies focusing on associations between all intangible assets and firm value (see Godfrey and Koh, 2001; Shahwan, 2004).

An aspect that has not been specifically addressed in prior studies is the extent to which the components of the goodwill asset segregated by 'age' are value relevant. Although the overall conclusion from prior research is that market values are positively associated with goodwill, and negatively associated with goodwill amortisation and goodwill write-offs, it is generally restricted to testing the association between market value and aggregated amounts of goodwill. A limitation of this research is that the reported amount of goodwill reflects the accumulation of goodwill arising from multiple acquisitions and is thus likely to reflect goodwill amounts of different 'ages'. An interesting empirical question therefore is whether the value relevance of goodwill endures over the time period it is recognised on the balance sheet. If goodwill is regarded as an asset over its nominated useful life, it is expected to be priced by the market for the period it is recognised. However, if the economic benefits of purchased goodwill are considered to dissipate over a shorter period than the nominated useful life, then the value relevance of goodwill should reduce with 'age'. The research question addressed in this study is: does the value relevance of goodwill hold over the time it is recognised on balance sheet?

[3] The reconciliation of shareholders' equity between US and non-US GAAP usually results in an increase in shareholders' equity.

4. RESEARCH METHOD AND RESULTS

4.1 Sample and data

As the primary focus of this study is to identify whether the information content of goodwill varies with its 'age', it is necessary to distinguish between goodwill purchased in a particular year and goodwill purchased in earlier years. Using ASX Findata, sample firms were selected on the basis of whether their goodwill increased in any year between 1995 and 1999; that is, the firm purchased goodwill in at least one year. This process yielded a total of 136 companies with goodwill acquisitions in one or more years between 1995 and 1999. For each firm in the sample, accounting data were hand-collected from the annual financial report for the year of goodwill acquisition. Data were also collected on goodwill acquired in the two years prior to the acquisition year to allow the remaining balance of goodwill in the acquisition year to be separated into goodwill of different 'ages'. To allow an examination of whether the value relevance of the acquired goodwill identified from the initial search decreases over the subsequent two years, accounting information (including any goodwill acquired) was also collected from the financial reports for the two years subsequent to the acquisition.

The dependent variable is the closing share price three months after balance date. This date was used to allow sufficient time for the release of the annual report by the relevant firm. The firm was excluded from the sample if no goodwill is reported in the company financial reports subsequent to the year of purchase. This process derived a final sample of 475 firm-years between 1995 and 2001.[4] Table 1 presents the distribution of sample firms by industry

[4] Data for the years 2000 and 2001 are included for sample firms with goodwill acquired in 1998 and 1999 to enable testing of the value relevance of the acquired goodwill in the year of acquisition and the two subsequent years (2000 and 2001).

and firm-year observations. It shows that the sample firms are widely dispersed across industries with no particular industry dominating the sample.[5]

[INSERT TABLE 1 HERE]

4.2 Regression Models

Value-relevance studies examine "the association between a security price-based dependent variable and a set of accounting variables"; if an accounting number is significantly related to the dependent variable, then it is regarded as value relevant (Beaver, 2002, p.459). A large body of literature has examined the relation between market values of equity and accounting numbers.[6] Value relevance studies currently employ an accounting-based valuation model developed in Ohlson (1995) and its later refinements (Barth, *et al*., 2001). The Ohlson model shows that the market value of a firm can be written as a function of the book values of equity and earnings. Accounting earnings are included in the model to capture information about asset and liability values that are not currently recognised in items recognised on the balance sheet (Barth, 2000). Thus, net income is a proxy for variables omitted from an accounting balance sheet model (Barth & Landsman, 1995). The model is operationalised in (1) with market value of equity as a summary measure of information relevant to investors, and book value of equity and net income as summary measures of information reflected in financial statement accounting numbers (Barth & Clinch, 1996).

$$MVE_{i,t} = \alpha_0 + \alpha_1 BVE_{i,t} + \alpha_2 NI_{i,t} + \varepsilon_{i,t} \quad (1)$$

MVE is the share price of firm *i* three months after year-end reporting date *t*, BVE is the book value of firm *i* net assets at year-end reporting date *t*, and NI is net income of firm *i* for year *t*. To examine the relationship between equity values and accounting goodwill numbers we

[5] Although the 'Miscellaneous industrials" category represents 26.5% of the sample, these firms are diverse in their activities and include mining services, agriculture services, automotive services, computer and office services and high technology.

[6] Holthausen and Watts (2001) and Barth, Beaver and Landsman (2001) provide comprehensive reviews of the value-relevance literature.

adopt a similar approach to Jennings *et al*. (1996) and Henning *et al*. (2000). In model (2) we first partition BVE to test whether total intangible assets are value relevant.

$$MVE_{i,t} = \alpha_0 + \alpha_1 BVExIA_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 TIA_{i,t} + \varepsilon_{i,t} \quad (2)$$

BVExIA is book value of equity excluding intangible assets and TIA is total intangible assets at year end reporting date *t* for firm *i*. TIA is then further partitioned in Model (3) into the components of total net goodwill (GWT) and identifiable intangible assets (IIA).

$$MVE_{i,t} = \alpha_0 + \alpha_1 BVExIA_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 IIA_{i,t} + \alpha_4 GWT_{i,t} + \varepsilon_{i,t} \quad (3)$$

We further explore whether the market values of recently acquired goodwill differ from goodwill acquired in prior years by partitioning GWT into the components of goodwill acquired in the current year (GWA_0) and the two prior years (GWA_{-1} and GWA_{-2}), and the balance of goodwill for each year excluding acquisitions ($GWTxA_0$, $GWTxA_{0-1}$ and $GWTxA_{0-2}$). These components of goodwill are incorporated into the following three regression equations:

$$MVE_{i,t} = \alpha_0 + \alpha_1 BVExIA_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 IIA_{i,t} + \alpha_4 GWA_{0i,t} + \alpha_5 GWTxA_{0i,t} + \varepsilon_{i,t} \quad (4)$$

$$MVE_{i,t} = \alpha_0 + \alpha_1 BVExIA_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 IIA_{i,t} + \alpha_4 GWA_{0i,t} + \alpha_5 GWA_{-1i,t} + \alpha_6 GWTxA_{0-1i,t} + \varepsilon_{i,t} \quad (5)$$

$$MVE_{i,t} = \alpha_0 + \alpha_1 BVExIA_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 IIA_{i,t} + \alpha_4 GWA_{0i,t} + \alpha_5 GWA_{-1i,t} + \alpha_6 GWA_{-2i,t} + \alpha_7 GWTxA_{0-2i,t} + \varepsilon_{i,t} \quad (6)$$

In regression (4), net goodwill is decomposed into goodwill acquired in the current year and the remaining balance of goodwill. Regression (5) disaggregates this remaining balance of goodwill between goodwill acquired in the prior year and goodwill acquired two or more years earlier. In regression (6) the remaining balance of goodwill is further disaggregated into goodwill acquired two years earlier and goodwill acquired three or more years previously.

Each component of goodwill is measured as the gross goodwill at acquisition less an estimated amount of amortised goodwill. Estimation of amortised goodwill is based on the

disclosed amount of amortisation expense for each year and the average goodwill amortisation period, which is inferred from the proportion of amortisation expense to total goodwill reported by the firm during the period of observation.[7]

To mitigate problems associated with heteroscedasticity all variables are measured on a per share basis. Initial descriptive statistics for the independent variables revealed some non-normality in data distributions with instances of skewness and kurtosis levels outside normal tolerance limits. To normalise distributions of affected variables extreme observations were 'winsorised'[8] (Foster, 1986) up to a limit of 5% of the observations for the affected variable (Tabachnick & Fidell, 1996). Reported regression results are also based on White's (1980) adjustments.

Pooling cross-sectional time series data has the potential to violate the underlying assumption of regression analysis as to independence of the observations. Lagrange Multiplier (LM) tests were conducted to determine whether the panel data should be tested using a random effects model rather than the classical regression model (Greene, 2000). Based on significant LM test results for the sample data, a random effects model is used in regression analyses. Because there may be time-specific effects with the balance sheet variables correlated across time, all regression models are tested using a two-way random effects model.

4.3 Test Results

Table 2, Panel A reports descriptive statistics for all independent variables on an undeflated basis, as well as the relative proportion of goodwill to total assets. Mean (median) net goodwill reported for the 475 firm-year observations is 9.20% (5.64%) of total assets indicating, on average, goodwill represents a substantial proportion of sample firms' assets.

[7] Any goodwill write-offs were excluded when calculating the implied goodwill amortisation period. The inferred amortisation periods for the sample firms are 6-10 years for 13% of the firms, 11-18 years for 11% of the firms and 20 years for 76% of the firms.

Table 1, Panel B reports descriptive statistics for all test variables, deflated by number of shares, entering the six regression models. The median values for IIA and GWT (0.0009 and 0.1310 respectively) indicate that net total goodwill (GWT) represents a major proportion of total intangible assets for the majority of sample firms. Further analysis reveals that only 53% of the sample firm-year observations have identifiable intangible assets. The relatively low incidence of identifiable intangible assets and the high level of goodwill as a proportion of total intangible assets is likely to have been induced by the sampling procedure, which required all sample firms to have non-zero amounts of total goodwill.

[INSERT TABLE 2 HERE]

Table 3 presents a correlation matrix of all test variables with Pearson correlations and *p*-values shown above the diagonal and Spearman correlations and *p*-values shown below the diagonal. Correlations among the independent variables entering each of the regression models are within conventional levels, suggesting multicollinearity is not a problem in any of the models.

[INSERT TABLE 3 HERE]

Results of the multivariate analysis of the panel data using a two-way random effects model are presented in Table 4. Regression model (1) tests the value relevance of financial statement accounting numbers captured by the book value of net assets (BVE) and net income (NI); the results show both variables are highly significant. In model (2) total intangible assets (TIA) are separated out from net assets, to test whether intangible assets in total are value relevant. The coefficient for TIA is positive and significant (t = 5.253, p<0.01), indicating that intangible assets reported in financial reports are relevant to market participants. In regression model (3) total intangible assets are partitioned between net total

[8] This technique changes the value of the extreme observation to the value of the nearest observation not viewed as 'suspect' (Foster, 1986).

goodwill (GWT) and identifiable intangible assets (IIA). The results show that while total goodwill is strongly positively related with firm value (t = 4.228, p<0.01), the association with identifiable intangible assets is not significant. The insignificant results for IIA is not surprising given that 47% of the firm-year observations have zero amounts for IIA and the amounts of IIA in the non-zero firm-years are on average relatively small.

[INSERT TABLE 4 HERE]

In models (4), (5) and (6) total goodwill is partitioned into goodwill acquired in the observation year (GWA_0), goodwill acquired in the prior year (GWA_{-1}) and goodwill acquired two years earlier (GWA_{-2}), with $GWTxA_n$ representing the balance of goodwill after the purchased goodwill for the respective years is deducted in each of the models. The results for model (4) show that both goodwill acquired in the observation year (GWA_0) and the balance of goodwill ($GWTxA_0$), that is, the aggregate of goodwill acquired in prior years, are positively and significantly associated with firm value (t = 2.810, p<0.01 and t = 5.126, p<0.01 respectively). Similarly, model (5) test results show the coefficients for goodwill acquired in the observation year, goodwill acquired in the prior year and the balance of goodwill (i.e., acquired more than one year previously) are all positive and significant. Test results for model (6), however, show that while the coefficients for goodwill acquired in the current and each of the prior two years (GWA_0, GWA_{-1} and GWA_{-2}), are positive and significant, the coefficient for the balance of goodwill ($GWTxA_{0-2}$) is not significant. This result suggests that only goodwill acquired within the most recent two years is considered an asset by investors, and goodwill purchased more than two years previously is not relevant in the valuation of firm equity.

The results in Table 4 indicate that the value relevance of acquired goodwill increases from the acquisition year to one year after the acquisition, and then decreases in the second year after acquisition and then is no longer value relevant three years after the acquisition. One

possible explanation for this pattern of value relevance is that over time the benefits of the acquisition are increasingly reflected in the normal operations of the firm so that these benefits are reflected in net income and not the balance of goodwill included in the regression models.[9]

An alternative explanation is that there is usually uncertainty as to whether corporate acquisitions will result in benefits (e.g., synergies) to the acquiring firm. It is likely that the benefits (or lack thereof) from an acquisition will take a number of years to be revealed to the market. Our results are consistent with the market becoming increasingly confident in the first two accounting periods after the acquisition that the balance of acquired goodwill represents future economic benefits. However, by the third year after the acquisition the market perceives that the future economic benefits embodied in goodwill are diminishing or are less likely to eventuate. Then by the following year, the market assesses that the balance of goodwill no longer represents future economic benefits. This interpretation of the results suggests that the economic benefits of goodwill are either consumed rapidly or that the market takes approximately three years to realise that the balance of goodwill will not result in economic benefits.

The possibility that goodwill does not represent economic benefits is consistent with corporate acquisitions not achieving operational improvements for the combined firm, and is supported by findings in the takeover literature. For example, Sharma and Ho (2002) find no evidence that Australian acquiring firms achieve improvements in post-merger accounting performance in the three years after the acquisition. Similarly, studies using sharemarket returns to assess performance have consistently found that acquirers do not achieve improved performance after the acquisition. For example, Brown and da Silva Rosa (1998) find that

[9] An implication here is that as the benefits are reflected in income, the recognised goodwill asset ceases to have future economic benefits and should be derecognised.

Australian acquiring firms earn normal buy-and-hold returns in the three years after the acquisition. However, when returns are measured on a monthly rebalanced basis over the same period, the acquiring firms significantly underperform the control portfolios. Evidence that acquiring firms earn significant negative returns post-takeover has also been found in the US (Agrawal, Jaffe and Mandelker, 1992) and the UK (Gregory 1997, and Brown, Finn and Hope 2000).

4.4 Sensitivity analysis

Sensitivity analysis is undertaken to ensure that the absence of any significant association between older goodwill (purchased more than two years previously) and firm value is not induced by firm-year observations where the balance of older goodwill is zero. Eliminating all firm-year observations where the value of $GWTxA_{0\text{-}2}$ is zero reduces the sample to 380 observations. Test results of regression model (6) for this reduced sample (not reported in tables) are consistent with results for the full sample, with the coefficients for goodwill acquired in each of the current and two prior years positive and significant, and the balance of goodwill acquired more than two years previously not significant.

Additional sensitivity analysis is conducted to explore whether these results hold at different levels of materiality of goodwill.[10] It is expected that the strength of association with share price is higher for more material levels of goodwill. To test the proposition that only material amounts of goodwill have information content, a sub-sample of observations based on materiality of goodwill relative to total firm assets is drawn for further testing.[11] We re-test regression model (6) using sub-samples of firms-years where net total goodwill as a percentage of total assets is at least five percent (n = 207) and at least ten percent (n = 134).

[10] Conventionally, an item is presumed to be material if the amount is more than ten percent of some base amount, immaterial if it is less than five percent, and for amounts falling between five and ten percent, judgement is exercised in deciding whether the item is material (see AASB 1031 *Materiality*).

[11] The materiality samples are drawn from the 380 observations with non-zero balance of goodwill purchased more than two years ago.

In addition, we test at the more conservative materiality threshold of two percent (n = 295), as the five percent level may be artificially high as the lowest threshold. The results for each of the materiality levels are substantially the same as for the full sample, indicating that the results reported in Table 4 are robust and not generally sensitive to different materiality levels of goodwill.

5. CONCLUSION

The objective of this study was to examine whether investors distinguish between the 'age' of goodwill reported on balance sheet in valuing firms' equity. Although prior research has consistently found that total reported goodwill is positively associated with firm value, there is only limited and inconclusive evidence (provided by prior U.S. research) that market participants differentiate between different components of goodwill. To test whether the 'age' of goodwill matters, we partition reported goodwill into the components of goodwill acquired in the current and each of the prior two years, and the remaining balance of goodwill acquired three or more years previously.

Our test results for a sample of 475 firm-year observations consistently show that goodwill acquired in the observation year and each of the prior two years is positively associated with firm value, but there is no significant association with goodwill acquired more than two years previously. These results are robust to elimination of observations with zero balances of goodwill purchased more than two years previously, and differing levels of materiality of the goodwill amount.

The absence of a significant relationship between the market value of equity and goodwill acquired more than two years previously suggests that older goodwill is not considered to be an asset by investors. One possible explanation for this result is that the purchase price paid in corporate acquisitions does not represent unidentified future economic benefits, or that any

benefits purchased are quickly consumed. Such an explanation is consistent with prior Australian research that finds no improvements in post-takeover performance of acquiring firms. Alternatively, our results may reflect that the benefits of acquisitions are quickly incorporated into the normal performance of the firm and hence are captured by the net income variable in our regression model. These two possible explanations could be explored by future research to further examine under what conditions acquisitions are more likely to result in value relevant goodwill, and provide additional insights by linking the takeovers literature with studies of goodwill value relevance.

Our findings have implications for the current debate about accounting for purchased goodwill, particularly in light of the recent change in the U.S., Australia and International accounting standards to using an impairment test to determine whether any portion of recognised goodwill should be expensed. If the economic benefits of recognised goodwill do not extend for more than two years, then the effect of applying an impairment test is to substitute internally generated goodwill for acquired goodwill. Our findings also extend research on the value relevance of goodwill in that, while prior studies have generally found that goodwill is viewed as an asset by the market, our findings show that there is an underlying differentiation of that valuation on the basis of the age of the goodwill. If market participants perceive that goodwill recognised on a firm's balance sheet has no economic benefits beyond two years after the date of acquisition, then continuing to include that goodwill as an asset in the financial report for many years afterwards means that financial reports of firms with older goodwill will fail to meet the basic requirement of providing relevant information that is useful for economic decision making.

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Table 1
Distribution of sample firms by industry and firm-year observations

Industry	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*Total Observations*	*No. of Firms*	*Percent*
Alcohol and tobacco	1	3	3	3	3	1		14	4	2.9%
Banks		1	5	4	3	1	1	15	5	3.7%
Building materials	4	5	7	3	3	1	1	24	7	5.1%
Chemicals		1	2	3	2	2		10	3	2.2%
Developers and contractors			2	1	1	1		5	2	1.5%
Diversified industrials	5	7	8	6	6	4	1	37	12	8.8%
Diversified resources		1	1	1				3	1	0.7%
Energy			1	1	1			3	1	0.7%
Engineering	2	4	6	7	6	2		27	8	5.9%
Food and household	2	2	3	2	3	1	1	14	4	2.9%
Gold		1	2	2	1			6	2	1.5%
Healthcare and biotechnology		5	6	6	3	3	1	24	6	4.4%
Infrastructure and utilities		1	1	2	2	2	1	9	2	1.5%
Insurance	2	2	2	1	3	4	1	15	4	2.9%
Investment and financial services	1	2	2	5	7	6	4	27	8	5.9%
Media	1	2	3	5	4	3	1	19	5	3.7%
Miscellaneous industrials	11	15	24	21	27	22	12	132	36	26.5%
Other metals			1	1	2	1		5	2	1.5%
Paper and packaging	1	2	4	3	3	2		15	4	2.9%
Property development			1	1	1			3	1	0.7%
Retail	1	4	6	6	5	4	3	29	8	5.9%
Telecommunications			1	2	3	1		7	3	2.2%
Tourism and leisure	1	2	4	4	4	2	2	19	4	2.9%
Transport	2	3	4	3	1			13	4	2.9%
Total	34	63	99	93	94	63	29	475	136	100%

Table 2
Descriptive Statistics
N = 475

Panel A: Undeflated

Variable	Mean $000	Median $000	Std.Dev $000	Min. $000	Max. $000
MVE	1,124,997	137,093	3,783,805	703	37,551,127
BVE	572,917	69,097	1,847,734	-9,920	16,923,000
NI	55,036	6,307	226,052	-1,474,000	2,223,000
BVExIA	446,352	40,789	1,685,437	-484,656	16,728,000
TIA	121,008	17,180	304,146	27	3,095,000
IIA	48,830	36	152,617	0	1,502,976
GWT	71,565	9,160	251,185	27	3,095,000
GW as % of Total Assets	9.20%	5.64%	11.03%	0.01%	68.81%
GWA_0	24,741	1,534	113,437	0	1,762,092
GWA_{-1}	17,104	950	89,093	0	1,578,000
GWA_{-2}	12,877	411	76,220	0	1,331,155
$GWTxA_0$	46,803	4,606	182,509	0	2,076,000
$GWTxA_{0-1}$	29,699	1,972	137,627	0	1,897,300
$GWTxA_{0-2}$	16,822	452	95,904	0	1,248,000

Panel B: Deflated by number of shares

Variable	Mean	Median	Std.Dev	Min.	Max.
MVE	3.2279	2.0000	4.1048	0.0300	36.8000
BVE	1.9266	1.3821	1.9575	-0.2612	15.3205
NI	0.2023	0.1282	0.4410	-1.6464	4.4200
BVExIA	1.4182	0.8869	1.7516	-1.1272	15.1440
TIA	0.5063	0.2320	0.6841	0.0009	3.9883
IIA	0.1932	0.0009	0.4776	0.0000	3.7590
GWT	0.3049	0.1310	0.4715	0.0009	3.9883
GWA_0	0.1174	0.0237	0.2872	0.0000	3.9324
GWA_{-1}	0.0833	0.0148	0.2358	0.0000	3.4167
GWA_{-2}	0.0608	0.0061	0.1849	0.0000	2.8822
$GWTxA_0$	0.1874	0.0692	0.3431	0.0000	3.4254
$GWTxA_{0-1}$	0.1041	0.0291	0.2230	0.0000	2.8823
$GWTxA_{0-2}$	0.0433	0.0065	0.1020	0.0000	0.8452

Variable definitions: MVE is the market value of equity for firm *i* three months after the end of the year *t*; BVE is the book value of equity at the end of the year *t*; NI is net income for the year *t*; TIA is net total intangible assets, IIA is net identifiable intangible assets and GWT is net total goodwill at the end of the year *t*. GWA_0 is net goodwill acquired in the observation year and represents the gross amount of goodwill acquired less any amortisation. GWA_{-1} is net goodwill acquired in the year prior to the observation year and GWA_{-2} is net goodwill acquired two years prior to the observation year; both variables are measured as the gross amount of goodwill acquired less a proportion of accumulated amortisation. $GWTxA_0$ is the net balance of goodwill after deducting goodwill acquired in the observation year. $GWTxA_{0-1}$ is the net balance of goodwill after deducting goodwill acquired in the observation year and one year prior. $GWTxA_{0-2}$ is the net balance of goodwill after deducting goodwill acquired in the observation and the two prior years.

Table 3
Test Variables Pearson Correlation Coefficients and *p*-values Above the Diagonal and Spearman Correlation Coefficients and *p*-values Below the Diagonal

	MVE	BVE	NI	BVExIA	TIA	IIA	GWT	GWA_0	GWA_{-1}	GWA_{-2}	$GWTxA_0$	$GWTxA_{0-1}$	$GWTxA_{0-2}$
MVE	1.0000	0.6976	0.6361	0.6213	0.4348	0.0695	0.4463	0.2856	0.2275	0.2694	0.4138	0.4138	0.3157
	.	0.0000	0.0000	0.0000	0.0000	0.1304	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
BVE	0.8367	1.0000	0.6748	0.9329	0.4839	0.1135	0.4834	0.3102	0.2896	0.2718	0.4630	0.4533	0.4025
	0.0000	.	0.0000	0.0000	0.0000	0.0133	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NI	0.7759	0.7521	1.0000	0.6274	0.3443	0.0799	0.3238	0.2260	0.1327	0.1823	0.2932	0.3238	0.2970
	0.0000	0.0000	.	0.0000	0.0000	0.0819	0.0000	0.0000	0.0038	0.0001	0.0000	0.0000	0.0000
BVExIA	0.7161	0.8699	0.6820	1.0000	0.1552	-0.1346	0.2767	0.1545	0.1756	0.1794	0.3123	0.3381	0.3315
	0.0000	0.0000	0.0000	.	0.0007	0.0033	0.0000	0.0007	0.0001	0.0001	0.0000	0.0000	0.0000
TIA	0.4667	0.4994	0.3433	0.1393	1.0000	0.6851	0.7360	0.5262	0.4095	0.3616	0.5992	0.5101	0.3983
	0.0000	0.0000	0.0000	0.0023	.	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
IIA	0.2296	0.2057	0.1506	-0.0574	0.5253	1.0000	0.1722	0.1081	0.0682	0.0578	0.1374	0.1157	0.1551
	0.0000	0.0000	0.0010	0.2119	0.0000	.	0.0002	0.0185	0.1376	0.2084	0.0027	0.0116	0.0007
GWT	0.4026	0.4528	0.2928	0.2263	0.8370	0.1607	1.0000	0.7031	0.5560	0.4870	0.8114	0.6677	0.5298
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0004	.	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
GWA_0	0.2606	0.2357	0.1946	0.0702	0.5073	0.1471	0.5740	1.0000	0.0691	0.1413	0.2195	0.2503	0.2457
	0.0000	0.0000	0.0000	0.1266	0.0000	0.0013	0.0000	.	0.1325	0.0020	0.0000	0.0000	0.0000
GWA_{-1}	0.1505	0.1525	0.0720	0.0327	0.3825	0.1365	0.4309	0.0099	1.0000	0.0504	0.7233	0.1964	0.2456
	0.0010	0.0009	0.1173	0.4771	0.0000	0.0029	0.0000	0.8295	.	0.2728	0.0000	0.0000	0.0000
GWA_{-2}	0.1756	0.2102	0.1571	0.1071	0.3057	0.1232	0.3544	0.0653	0.0172	1.0000	0.5973	0.8172	0.2010
	0.0001	0.0000	0.0006	0.0195	0.0000	0.0072	0.0000	0.1553	0.7077	.	0.0000	0.0000	0.0000
$GWTxA_0$	0.3230	0.3898	0.2496	0.2284	0.6545	0.1442	0.7856	0.1267	0.6095	0.5050	1.0000	0.7847	0.5835
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0016	0.0000	0.0057	0.0000	0.0000	.	0.0000	0.0000
$GWTxA_{0-1}$	0.3062	0.3547	0.2750	0.2321	0.5023	0.1407	0.5982	0.2017	0.1237	0.7269	0.7470	1.0000	0.6506
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0021	0.0000	0.0000	0.0069	0.0000	0.0000	.	0.0000
$GWTxA_{0-2}$	0.2851	0.2826	0.2534	0.2190	0.3520	0.1103	0.4260	0.2344	0.1770	0.2033	0.5116	0.6962	1.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0162	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	.

See Table 2 for variable definitions

Table 4
Regressions of Market Value of Equity on Book Value of Equity, Net Income and Components of Goodwill

Model 1: $MVE_{i,t} = \alpha_0 + \alpha_1 BVE_{i,t} + \alpha_2 NI_{i,t} + \varepsilon_{i,t}$
Model 2: $MVE_{i,t} = \alpha_0 + \alpha_1 BVExIA_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 TIA_{i,t} + \varepsilon_{i,t}$
Model 3: $MVE_{i,t} = \alpha_0 + \alpha_1 BVExIA_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 IIA_{i,t} + \alpha_4 GWT_{i,t} + \varepsilon_{i,t}$
Model 4: $MVE_{i,t} = \alpha_0 + \alpha_1 BVExIA_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 IIA_{i,t} + \alpha_4 GWA_{0i,t} + \alpha_5 GWTxA_{0i,t} + \varepsilon_{i,t}$
Model 5: $MVE_{i,t} = \alpha_0 + \alpha_1 BVExIA_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 IIA_{i,t} + \alpha_4 GWA_{0i,t} + \alpha_5 GWA_{-1i,t} + \alpha_6 GWTxA_{0\text{-}1i,t} + \varepsilon_{i,t}$
Model 6: $MVE_{i,t} = \alpha_0 + \alpha_1 BVExIA_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 IIA_{i,t} + \alpha_4 GWA_{0i,t} + \alpha_5 GWA_{-1i,t} + \alpha_6 GWA_{-2i,t} + \alpha_7 GWTxA_{0\text{-}2i,t} + \varepsilon_{i,t}$

Variables[#]	Model 1 Coefficient *t*-statistic	Model 2 Coefficient *t*-statistic	Model 3 Coefficient *t*-statistic	Model 4 Coefficient *t*-statistic	Model 5 Coefficient *t*-statistic	Model 6 Coefficient *t*-statistic
Intercept	1.0251 2.734**	0.7900 2.092*	0.9198 2.411*	0.8258 2.255*	0.8463 2.317*	0.8631 2.368*
BVE	0.9328 8.8908**					
NI	2.4514 4.637**	2.3239 4.433**	2.5512 4.875**	2.5566 4.927**	2.6188 5.051**	2.6640 5.143**
BVExIA		0.9156 8.465**	0.8687 7.845**	0.8567 7.817**	0.8301 7.495**	0.8210 7.346**
TIA		1.5909 5.253**				
IIA			0.3563 0.434	0.2899 0.358	0.2803 0.346	0.2715 0.334
GWT			2.2938 4.228**			
GWA_0				1.8161 2.810**	1.9519 2.962**	1.9356 2.874**
$GWTxA_0$				3.3450 5.126**		
GWA_{-1}					3.2828 4.305**	3.3585 4.220**
$GWTxA_{0\text{-}1}$					3.1920 4.053**	
GWA_{-2}						3.2040 2.766**
$GWTxA_{0\text{-}2}$						3.6566 1.231
N	475	475	475	475	475	475
Adjusted R^2	0.8369	0.8389	0.8381	0.8401	0.8398	0.8404

* *p*-value significant < 0.05 (two-tailed)
** *p*-value significant < 0.01 (two-tailed)
[#] All variables are deflated by the number of shares at year end
See Table 2 for variable definitions