Has Goodwill Accounting Gone Bad?

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FAS 142 replaces systematic amortization of goodwill with a periodic impairment test. We examine the impact of this standard on the accounting for and valuation of goodwill. The evidence indicates that the new accounting results in inflated goodwill balances, untimely impairments and increased earnings volatility. Goodwill impairments tend to be relatively high when pre-goodwill impairment operating margins are relatively low, suggesting that goodwill impairments are reported when the benefits generated by the goodwill are relatively low. Goodwill impairments lag deteriorating operating performance and stock returns by at least two years. Finally, investors do not appear to fully understand the extent to which goodwill is inflated, since firms with deteriorating operating performance and large goodwill balances have predictable future impairments and negative abnormal stock returns. Overall, our results suggest that management exploit the discretion afforded by FAS 142 to temporarily overstate goodwill, earnings and stock prices in the periods following acquisitions.

Keywords: goodwill impairments; FAS 142; accounting discretion; fair value; abnormal return

1. Introduction

FAS 142 radically changes the accounting for goodwill and related intangible assets that are deemed to have 'indefinite' lives. It eliminates the periodic amortization over an estimated life not to exceed 40 years, and instead institutes a periodic impairment test. FAS 142 embodies the FASB's march toward 'fair value' accounting, whereby management are charged with recording periodic changes in the fair values of operating assets rather than trying to systematically match the cost of such assets to the benefits that they are expected to generate. The FASB claims that the new standard "improves financial reporting because the financial statements of entities that acquire goodwill and other intangible assets will better reflect the underlying economics of those assets" (FAS 142, p7). Assuming that management make unbiased forecasts of the future benefits from intangible assets and incorporate these forecasts into impairment estimates on a timely basis, the standard would achieve its intended objective. However, such improvements hinge critically on the role of management in recording impairment charges on a timely basis. Given the inherent unverifiability of fair values for intangibles and management's incentives to inflate assets and earnings, it is possible that management will use this new discretion to delay impairments (Watts, 2003; Ramanna, 2008; Ramanna and Watts, 2009). If this were the case, FAS 142 would simply result in the aggressive application of historical cost accounting, whereby assets are initially capitalized at cost and then only written down in the face of overwhelming evidence of impairment. Such accounting causes the initial overstatement of assets and earnings, and the later understatement of earnings when the aggressive accounting is reversed through large and untimely 'big bath' impairments. Moreover, it is possible that investors could temporarily overvalue companies with inflated asset balances, leading to poor resource allocation and lower returns to investors.

In this study, we examine the impact of FAS 142 on the accounting for and valuation of goodwill in an effort to distinguish which of these two alternatives best fits the empirical data following the implementation of FAS 142. Our evidence indicates that the application of goodwill accounting under FAS 142 produces accounting numbers that deviate from economic reality and results in the delayed recognition and pricing of declines in the fair value of goodwill. First, we show that the new accounting has resulted in increased goodwill balances and decreased expenses. This means that either the previous accounting had been amortizing goodwill too quickly or that the current accounting is impairing goodwill too slowly. Second, we show that goodwill impairments tend to be made when pre-impairment margins are relatively low. We note that this is exactly the opposite to the economics of fair value accounting. If management is able to estimate the timing and magnitude of future cash flows associated with goodwill, then goodwill impairments should be relatively large during periods when the cash flows generated are relatively high, suggesting that goodwill impairments should be greatest when pre-impairment margins are relatively high. Our evidence instead suggests that management only take impairments once it becomes obvious that significant benefits from the goodwill have expired. We note that this evidence is inconsistent with the stated objective of FAS 142 in providing better information about goodwill. For the accounting to provide better information, it is critical that management can forecast the future benefits and match the impairments to the expiration of the benefits. Instead, our evidence suggests that management only report impairments after it is obvious that most of the benefits have expired. This results in systematically overstated goodwill and earnings in the periods following acquisitions. Thus, consistent with the arguments in Ramanna and Watts (2009), we find evidence inconsistent with

the idea that management use the discretion afforded by FAS 142 to convey private information about future cash flows.

We next examine whether goodwill impairment decisions by management contain any new information to financial statement users. To answer this question directly, we first examine stock return behavior before, during and after the announcements of goodwill impairments. We find that stock returns lead goodwill impairments by at least two years prior to the announcements of impairment losses. Furthermore, the announcements of goodwill impairments cause only small market reactions compared to the magnitude of impairment losses. We next demonstrate that information about bloated goodwill balances and deteriorating financial performance can be used to forecast impairments at least one year in advance. Moreover, we show that not all of this information is immediately reflected in stock prices on a timely basis. Consequently, firms with deteriorating operating performance and overstated goodwill have temporarily inflated stock prices. Collectively, this evidence suggests that the goodwill impairments contain little new information and that management use the discretion afforded by FAS 142 to delay the recognition and pricing of declines in the fair value of goodwill. This is inconsistent with FASB's claim that FAS 142 will provide users of financial statements "with a better understanding of the expectations about and changes in [goodwill and intangible assets] over time, thereby improving their ability to assess future profitability and cash flows" (FAS 142, p.7).

The study contributes to existing literature in the following aspects. First, we show that goodwill impairments fail a basic test that is required for them to provide relevant and timely information about the fair values of the associated goodwill. Specifically, we show that goodwill impairments are highest when pre-impairment margins are the lowest. This result is inconsistent

with the idea that management use impairments to convey information about the timing of the future benefits from goodwill. Instead, it suggests that management simply defer impairments until it is obvious that the future benefits of the goodwill have largely expired. Second, we show that goodwill impairments significantly lag real economic impairments and are largely anticipated by the market. In related research, Hayn and Hughes (2006) provide evidence that goodwill impairments lags behind the deterioration of operating performance. However, the sample in their study ends in 2001, the year just prior to the promulgation of FAS 142. Our evidence demonstrates that the new guidance in FAS 142 relating to impairments has not resulted in more timely impairments. Focusing on the initial adoption period of FAS 142, Li et al. (2004) and Chen et al. (2004) both document that stock returns lead goodwill impairments. However, because their sample periods are short and preceded by market collapse in 2000 and 2001, it is hard to reject the alternative explanation that impairment is the consequence of declining market value in favor of the hypothesis that market anticipates goodwill impairment (Li et al., 2004). By focusing on goodwill impairments in the post-FAS 142 period, our study provides direct evidence on the timeliness of impairments after the adoption of FAS 142.

Finally, our study provides evidence on the costs associated with the accounting discretion granted by FAS 142. When discussing Beatty and Weber (2006), Bens (2006) points out that when allowing management the discretion in FAS 142, it is unclear "whether there are real costs that are not already included in share prices and the various agency contracts". Bens (2006) claims that studies of accounting choice would become less appealing if asset prices already take into account management's strategic use of accounting discretion. We answer this question by providing direct evidence that the market is misled by the inflated earnings and goodwill balances resulting from delayed impairments.

The remainder of this paper is organized as follows. Section 2 discusses related research and hypotheses development. Section 3 describes sample selection and research design. Section 4 discusses empirical results and Section 5 concludes.

2. Related research and hypotheses development

2.1 Related research

When FASB added the project on business combinations to its agenda in 1996, the objective was to improve the transparency of the accounting for business combinations. FAS 142, which replaces APB Opinion 17 and portions of FAS 121, eliminates annual amortization of goodwill over its anticipated useful life (up to 40 years) and institutes periodic impairment tests. FASB believes that FAS 142 "will provide users with a better understanding of the expectations about and changes in [goodwill and intangible assets] over time, thereby improving their ability to assess future profitability and cash flows" (FAS 142, p.7). The new standard requires managers to estimate fair value of goodwill at the reporting unit level. Because these estimates are not based on actively traded market prices, they are not verifiable and hence are open to considerable manipulation (Holthausen and Watts, 2001). Watts (2003) argues that the allocation of goodwill among reporting units is arbitrary because goodwill represents joint benefits accrued to all reporting units or the firm as a whole.

Several studies examine the accounting discretion granted by FAS 142. Ramanna (2008) shows that firms, which have more potential for opportunism (the "pro-poolers"), use contributions from their political action committees to members of Congress as a means of lobbying for preferred rules of FAS 142. Beatty and Weber (2006) examine accounting discretion in the initial adoption of FAS 142. When companies first adopt FAS 142, managers

have two alternatives. They could either record the impairment charge at adoption as the effect of a change in accounting principle ('below the line'), or delay impairment to future periods income from continuing operations ('above the line item'). Beatty and Weber find that the likelihood and magnitude of a firm's transitional impairment charge at adoption is associated with the cost of violating debt covenants, the extent to which the firm's stock price is closely tied to income from continuing operations, the extent to which the firm has an earnings-based bonus plan, and CEO tenure.

Ramanna and Watts (2009) examine impairment decisions of firms for which the market price indicates the need for goodwill impairments (positive goodwill, book-to-market ratio greater than one). They find no evidence that the high frequency of non-impairments in their sample is attributable to managers having favorable private information. Instead, they find evidence of goodwill impairments decreasing in CEO reputation and debt-covenant violation concerns. Together, the evidence in these studies suggests that management use the discretion afforded by FAS 142 to opportunistically manipulate earnings by selectively delaying goodwill impairments.

By promoting the use of unverifiable fair-value estimates in goodwill impairment tests, standard setters implicitly assume that managers will use the accounting discretion to convey private information on future cash flows (Ramanna and Watts, 2009). Chen et al. (2004) examine goodwill impairments in 2002, which include both adoption impairments and subsequent first year impairments. They find that adoption impairments are associated with prior year stock returns but not with contemporaneous returns, while first year impairments are associated with contemporaneous returns. They interpret this as evidence that adoption impairments are already impounded in stock prices, while first year impairments provide new

information to the market. Similarly, Li et al. (2004) find that stock returns lead goodwill impairments. However, because the sample periods in these studies are short and preceded by the market collapse in late 2000 and 2001, the result that stock returns lead goodwill impairments may suggest that the impairments are a consequence of declining market values rather than goodwill impairments being anticipated by the market.

Several studies examine the impact of FAS 142 on the information content of goodwill impairments. But the results are mixed. Bens et al. (2007) find that stock returns are negative during the two-day window of impairment announcements. The effect is attenuated for firms with low information asymmetry (high analyst following or high percentage of institutional holdings), suggesting that market impounds the information prior to the announcements by these companies. They also find that market reaction to goodwill impairments is not significant even for high information asymmetry firms following the adoption of FAS 142, suggesting that the fair value tests in FAS 142 make it easier for managers to manipulate impairment timing, therefore making impairments less informative.

Ahmed and Guler (2007) examine the association of goodwill write-offs and contemporaneous 12-month stock return, and find that goodwill write-offs are more negatively associated with stock returns after FAS 142. They interpret the results as evidence that FAS 142 improves the reliability of goodwill write-offs. However, the documented effect of FAS 142 disappears when the sample only includes goodwill write-off greater than 5% of total assets, indicating that the results may be driven by small impairments.

Chambers (2007) compares the value relevance of as-reported FAS 142 accounting numbers to that of as-if accounting numbers produced by alternative goodwill accounting methods, which include systematic goodwill amortization with no annual impairment testing,

combined amortization and impairment, and a system with no amortization and impairment. The results show that annual impairment testing improves financial reporting, as measured by increased R-square of the regression of market value of equity on accounting numbers. However, he also finds that elimination of systematic amortization reduces the quality of financial reporting and a system combining impairment and amortization provides the most value relevant goodwill numbers.

Finally, Hayn and Hughes (2006) examine whether available financial disclosures on acquisitions allow investors to effectively predict goodwill impairments. They find that available disclosures do not provide financial statement users with information to adequately predict goodwill impairments. They also document that goodwill write-offs lag behind the deterioration of operating performance. Even though their study is motivated by the changes in goodwill accounting introduced by FAS 142, their sample predates FAS 142. Therefore, it is not clear whether their results can be generalized to post-FAS 142 era. In addition, the variables in their model may only represent a subset of investors' information set. Thus we can not infer that investors are unable to adequately predict goodwill impairments based on the low predictability of their model.

2.2 Development of hypotheses

FAS 142 is argued to improve financial reporting on the grounds that the resulting financial statements will better reflect the underlying economics of goodwill and other intangible assets. In this study, we examine the impact of new regulations on the accounting for and valuation of goodwill.

The first question we examine is whether FAS 142 helps to match the cost of goodwill assets to the associated benefits. In accounting, there are generally three ways to allocate the

cost of an asset over time. The first method is to expense all the cost upfront, regardless of the economic life of the asset, such as the expensing of R&D costs. Such treatment understates earnings in the initial period when the asset is acquired or developed, but overstates earnings in subsequent periods when the benefits of the asset are realized. The second method is to amortize the cost of the asset over its anticipated economic life, such as depreciation of property, plant and equipment. This method assumes the benefits of the asset are distributed over time according to some predetermined formula and may be inappropriate for assets like goodwill whose benefits may be sporadic and indefinite. The last method is to periodically test whether the asset value is reduced and to impair the asset accordingly, such as goodwill impairment.

In a world where management could perfectly estimate the future benefits and faithfully report the corresponding fair asset values, the last method is the most economically meaningful. Under such a scenario, impairments in asset value would be greatest during periods in which the cash flows generated by the asset are the greatest, since these would be the periods during which the anticipated future cash flows would decline by the most. However, in practice, management could use the discretion afforded by the last method to opportunistically delay impairments until there is overwhelming evidence that the asset's benefits have expired. The first two methods serve to limit this type of opportunistic behavior by management. In cases where the economic life of the asset is reasonably verifiable (e.g., equipment), systematic amortization provides a good trade-off between relevance and reliability. In cases where the economic life is unverifiable (e.g., R&D), immediate expensing serves to limit opportunistically aggressive accounting by management.

To investigate whether managers use the new flexibility afforded by FAS 142 to opportunistically delay impairments until there is overwhelming evidence that the corresponding

assets are impaired, we examine the correlation between goodwill impairment and pre-impairment operating margin. A positive correlation is consistent with impairments correctly mapping into expiring economic benefits, while a negative correlation is consistent with opportunistic delay of impairments until the benefits have already expired. Therefore, the first hypothesis (stated in null) is as follows.

H1. If managers match the cost of goodwill to its benefit, then goodwill impairment and pre-impairment operating margin are positively correlated.

The second research question we examine is whether goodwill impairments convey new information to financial statement users. FASB claims the new rules in FAS 142 will help financial statement users to form a better expectation of the future cash flows from a company's goodwill. By granting managers the unverifiable discretion to assess the fair value of goodwill, standard setters must implicitly assume that managers will use the discretion to convey private information on future cash flows (Ramanna and Watts, 2009). However, agency theories predict that managers will use the discretion opportunistically. If managers do use the accounting discretion to convey private information about future cash flows as FASB expects, then announcements of goodwill impairment are expected to generate significantly negative market reaction, considering that the magnitude of goodwill impairment is substantial in both relative and absolute terms. On the contrary, if managers opportunistically delay the timing and magnitude of goodwill impairments, then the announcements of goodwill impairment are expected to contain stale news and elicit little market reaction. To test for the information

content of goodwill impairments, we examine stock return behavior before, during and after announcements of goodwill impairments. The second hypothesis (stated in null) is as follows.

H2. Goodwill impairments are timely measures of declines in firm value, as measured by contemporaneous stock returns.

Finally, we examine whether the accounting discretion granted by FAS 142 is costly to financial statement users, and focus on one aspect of the costs: mispricing. Even if stock prices tend to anticipate goodwill impairments, it is possible that they are not fully anticipated. Thus, evidence of a negative stock price reaction to impairment announcements does not necessarily mean that impairments contain private information. Instead, it is possible that impairments could contain public information that stock prices have failed to correctly reflect. If this is the case, then management can temporarily inflate their firms' stock prices by opportunistically deferring goodwill impairments. We select a parsimonious set of non-market variables that we hypothesize will identify cases of inflated goodwill. If stock prices efficiently reflect all available information about the value of goodwill, then these variables should not predict future stock returns associated with future predictable impairments. The third hypothesis (stated in null) is as follows.

H3. Stock prices correctly reflect all publicly available information concerning inflated goodwill balances and future goodwill impairments.

3. Research design and sample selection

Compustat (Xpressfeed) contains annual goodwill information beginning 1988 and quarterly goodwill information beginning 2000.[1] Because the coverage of goodwill items in the quarterly database is sparse prior to 2002, we use annual data for the majority of our tests. However, to test Hypothesis 2, we need specific announcement dates for goodwill impairments. Therefore, for this test, we use quarterly data, and assume that the impairment announcement date is the same as the earnings announcement date (RDQ).[2]

The sample period covers fiscal years from 2000 to 2007. The sample period starts in 2000 because impairment of goodwill pretax (GDWLIP) is available in Xpressfeed fundamental annual database since 2000.[3] We require observations with positive total assets (AT) and positive goodwill balance (GDWL). If GDWLIP is missing and GDWL is not missing, we replace the missing value of GDWLIP with zero.

To test Hypothesis 1, we use operating income after depreciation (OIADP) scaled by sales (SALE) as a measure of pre-impairment operating margin. This measure is not affected by goodwill impairment charges, and captures firms' operating performance.[4]

To test Hypothesis 2, we compare raw and size-adjusted stock returns over the 30-month period starting 24 months prior to earnings announcement date of impairment and non-

[1] There is a significant increase in observations with non-missing goodwill balance from 2001 Q3 to Q4 in Compustat quarterly database. There are approximately 7,500 quarterly observations in Compustat database (with positive total assets). In 2001 Q3, there are approximately 800 observations with non-missing goodwill balance, while in 2001 Q4 the number increases to 3,750. This is because Compustat began to collect goodwill as a separate line item in 2001 Q4, then backfilled quarters when a good breakout was available.

[2] Li et al (2004) document that 95.5% of their sample firms simultaneously announce goodwill impairment losses and quarterly/annual earnings during the same three-day window.

[3] The provisions of SFAS 142 are required to be applied starting with fiscal years beginning after December 15, 2001.

[4] Operating income after depreciation does not include special items (SPI), which contains goodwill impairment charges.

impairment samples. Raw returns include dividends and other distributions. If a stock is delisted during the return window, then the CRSP delisting return is included in the buy-hold return, and the proceeds are reinvested in the CRSP size-matched decile portfolio for the remainder of the return cumulation period. If the delisting return is missing from the CRSP database, we use the replacement values suggested by Shumway (1997) and Shumway and Warther (1999). Specifically, if the stock is traded on NYSE or AMEX prior to delisting, we replace the missing delisting return with -30% (Shumway, 1997; Shumway and Warther, 1999); if the stock is traded on NASDAQ prior to delisting, we replace the missing value with -55% (Shumway and Warther, 1999). Size-adjusted returns are computed by measuring the buy-hold return in excess of the buy-hold return on a value-weighted portfolio of firms having similar market values. The size portfolios are formed by CRSP and are based on size deciles of NYSE, AMEX and NASDAQ firms. Portfolio membership is determined using the market value of equity at the beginning of the calendar year in which the return cumulation period begins.

To test Hypothesis 3, we identify the following variables as leading indicators of goodwill impairments.

(1) *Relative magnitude of goodwill balance (GTA)*. We scale goodwill balance (GDWL) by total assets (AT). High goodwill balance may indicate delayed impairment decisions by managers. Therefore, ceteris paribus, goodwill balance should be positively associated with the likelihood of impairments.

(2) *Return on assets (ROA) and change in ROA (*Δ*ROA)*. ROA is measured as operating income after depreciation (OIADP) divided by total assets (AT). Current accounting performance reflects future cash flows (Dechow 1994). Deterioration in earnings indicates lower

fair value of the firm's assets. Therefore, accounting earnings should be negatively associated with the likelihood of future goodwill impairments.

(3) *Stock returns (RET)*. Because declining stock prices indicate lower present value of future cash flows, stock returns should be negatively associated with the likelihood of future goodwill impairments. Stock returns (RET), inclusive of dividends and other distributions, are measured over the 12-month period beginning three months after the end of the previous fiscal year.

To summarize, the model of predicting goodwill impairments is as follows.

$$IMPDUM_{t+1} = \alpha + \beta_1 GTA_t + \beta_2 ROA_t + \beta_3 \Delta ROA_t + \beta_4 DUM_t + \beta_5 RET_t + \varepsilon_{t+1} \quad (1)$$

where IMPDUM is a dummy variable that is equal to one if GDWLIP is negative, and zero otherwise; DUM is a dummy variable that is equal to one for observations in the top quintile of GTA *and* bottom quintile of ROA, and zero otherwise. DUM captures the interaction between the goodwill balance and operating performance. Firms with the combination of high proportion of assets represented by goodwill and low and deteriorating return on assets are more likely to have overvalued goodwill. To minimize the influence of outliers, we winsorize ROA at ±0.5, and GTA at 0 and 1.[5] The final sample has 23,224 firm-year observations, among which 2,154 observations report goodwill impairments (impairment sample) and 21,070 observations have no impairment (non-impairment sample).

4. Empirical results

4.1 Time-series trend of goodwill and impairment during pre- and post-FAS 142 periods

[5] All observations have GTA within the boundaries before winsorization.

The provisions of FAS 142 are required to be applied starting with fiscal years beginning after December 15, 2001. As Figure 1 Panel A shows, the average ratio of goodwill to total assets in U.S. firms has been increasing since this time. The trend is especially noteworthy because this period was accompanied by a decrease in acquisition activities and a stock market collapse. The logical inference is that the increase results from more aggressive accounting for goodwill under FAS 142.

Figure 1 Panel B plots the time-series trend of amortization of intangibles (AM) scaled by the beginning balance of intangible assets (INTAN). Consistent with the elimination of goodwill amortization by FAS 142, amortization expense drops after 2001.

Because Xpressfeed does not collect goodwill impairments as a separate line item before 2000, we use negative special items as a proxy. However, because negative special items may also represent impairments of other long-term assets, we include property, plant and equipment in the denominator to examine the trend of total amortization and impairment charges to related assets. Figure 1 Panel C shows that during the 18-year period from 1990 to 2007, the average balance of property, plant and equipment (PPENT) in U.S. firms is decreasing, while intangible assets have become an increasingly important component of firms' assets. Figure 1 Panel D plots the sum of depreciation and amortization (DP) and the absolute value of negative special items (SPI), scaled by the beginning balance of intangible assets and property plant and equipment. The picture clearly shows that the level of depreciation, amortization and impairment drops dramatically after 2001, the year when FAS 142 became effective.

Figure 1 Panel E plots the standard deviation of the sum of depreciation, amortization and the absolute value of negative special items scaled by the beginning balance of total assets. The

figure shows that cross-sectional volatility in post-FAS 142 period is higher than that in pre-FAS 142 period. This is consistent with ineffective matching of costs to benefits under FAS 142.

4.2 Correlation between goodwill impairment and pre-impairment operating margin

Figure 2 plots the mean and median operating income after depreciation (scaled by sales) for groups formed on goodwill impairments. Observations with zero goodwill impairments are in group 0. Observations with non-zero goodwill impairments are assigned to terciles each year based on goodwill impairment pretax amount (-1*GDWLIP) scaled by sales. The figure shows that goodwill impairments tend to be the highest when pre-impairment operating margins are the lowest. Table 1 Panel A shows that Pearson (above diagonal) and Spearman (below diagonal) correlations between pre-impairment operating margin and goodwill impairment are -0.196 and -0.134 respectively, with corresponding p-value less than 0.1%. Table 1 Panel B reports the distribution of the ratio of goodwill impairment divided by the goodwill balance at the beginning of the year. The sample for this table is restricted to firms with non-zero goodwill impairments, i.e. the 2,154 firm-year observations in the impairment sample. The value at the 75th percentile is 0.724, which indicates that in at least 25% of the goodwill impairments, companies write off more than 70% of the goodwill balance. The fact that a great portion of firms write off the majority of their goodwill balance in a single year suggests that goodwill impairments are delayed until goodwill is largely exhausted. Overall, the evidence in Table 1 suggests that goodwill impairments occur during periods in which the benefits generated by the goodwill are the lowest and the value of goodwill has already expired. Therefore, Hypothesis 1 is rejected.

4.3 Market response to the announcements of goodwill impairment

The evidence thus far suggests that managers may delay goodwill impairments until the value of goodwill is exhausted. In other words, goodwill impairments reflect a lagged indicator of goodwill expiration rather than a leading indicator of expected future cash flows. This suggests that goodwill impairment decisions by management probably convey little new information to the public.

Figure 3 plots the cumulative raw (Panel A) and size-adjusted (Panel B) stock returns of impairment and non-impairment samples during the 30-month period starting 24 months prior to the earnings announcement date. We use the Xpressfeed fundamental quarterly database for these tests. The sample selection criteria are the same as previously described. Due to data limitations in the quarterly database, the sample period covers fiscal quarters from 2002 to 2007. There are 76,738 firm-quarter observations, of which 2,290 observations report goodwill impairment and 74,448 observations do not.

As Hypothesis 2 states, if goodwill impairment decisions are a timely reflection of changes in expected future benefits, we should see less than a one quarter lag between poor stock price performance and impairment announcements. However, the evidence in Figure 3 fails to support Hypothesis 2. First, prices anticipate goodwill impairments at least 24 months prior the impairment announcements. Second, the information in impairments has largely been incorporated into stock prices prior to the announcement. Consequently, the announcement of goodwill impairments does not cause an economically significant price reaction. Untabulated results show that the mean (median) quarterly goodwill impairment loss is $187.5 million ($8.4 million), which is substantial considering that the mean (median) operating income after depreciation for the impairment sample is only $189.1 million ($1.5 million). However, the mean size-adjusted return of the impairment sample during the three-trading-day window

starting one trading day prior to the earnings announcement date is only -1.1%.[6] Compared to the substantial impairment losses, the market reaction during the announcement period is minor. Finally, there is no noticeable drift subsequent to the announcement date, indicating that market adjustment is complete. The evidence in Figure 3 shows that market largely anticipates goodwill impairments, suggesting that the impairment decisions by management convey little new information, but rather are delayed response to the changes in firms' fundamental. This evidence contradicts FASB's claim that financial statements after FAS 142 will better reflect the underlying economics of goodwill and other intangible assets.

4.4 Are investors misled by inflated earnings and goodwill balances?

In the discussion of Beatty and Weber (2006), Bens (2006) points out that when allowing management the discretion in FAS 142, it is unclear "whether there are real costs that are not already included in share prices and the various agency contracts". We have shown that the accounting discretion in FAS 142 leads to inflated goodwill balances, untimely impairments and increased earnings volatility. In this section, we examine whether the overstatement misguides investors' assessment about the value of firms' assets. As Figure 3 shows, stock prices largely incorporate the effects of goodwill impairments by the time they are announced. We therefore seek to determine whether other fundamental information anticipates both stock price declines and goodwill impairments. In other words, while prices at least partially anticipate goodwill impairments, we seek to investigate whether they efficiently impound all available information about future impairments.

[6] Several studies document that stock response to the announcement of goodwill impairment is no more than 1% (e.g. Li et al., 2004; Bens et al., 2007).

Table 2 presents summary statistics for indicators of goodwill impairments. As Panel A shows, goodwill on average accounts for 19.5% of total assets for observations that announce goodwill impairment losses in the next 12 months. The number is significantly higher than the 13.6% in non-impairment sample. The impairment sample also experiences deteriorating operating performance: mean ROA and ΔROA are -0.004 and -0.016, respectively. The corresponding numbers for non-impairment sample are 0.052 and 0.001. 11.7% of observations in the impairment sample have the combination of high (top quintile) goodwill balance and low (bottom quintile) earnings, while only 3.7% of observations in the non-impairment sample are in this category. Panel B presents Pearson (above diagonal) and Spearman (below diagonal) correlations. As expected, the likelihood of goodwill impairment is positively associated with goodwill balance, and negatively associated with earnings and stock returns.

Table 3 reports logistic regression results of Equation (1) using Fama and MacBeth (1973) regression analysis. Model 1 is the full model and Model 2 excludes stock returns from the predictors. The results of Model 1 show that all variables are statistically significant and have the predicted signs, except for ΔROA, suggesting that operating performance and goodwill balance provide additional information about future impairments beyond the information contained in stock returns. In addition, the statistically significant coefficient on DUM (t=3.56) suggests that firms with the combination of extremely high goodwill balance and extremely low earnings are more likely to report subsequent goodwill impairments even after controlling for the main effects of GTA and ROA. The in-sample classification accuracy can be measured by the average percentage of concordant pairs, which is 69%. The results of Model 2 show that the magnitude and statistical significance of GTA, ROA and DUM are similar after excluding stock

return from the prediction model. The coefficient on ΔROA becomes statistically significant (t = -2.42). On average, Model 2 produces 65% concordant pairs.

To assess the out-of-sample predictive ability of the models, we divide the whole sample into estimation sample and hold-out sample. The estimation sample covers fiscal years from 2000 to 2003, with 10,011 firm-year observations (986 impaired observations and 9,025 non-impaired observations). The hold-out sample covers fiscal years from 2004 to 2007, with 13,213 firm-year observations (1,168 impaired observations and 12,045 non-impaired observations). Table 4 Panel A reports logistic regression results of Model 1 and Model 2 in the estimation sample. The results are similar to those reported in Table 3. This suggests that the relation between the impairment predictors and goodwill impairments have been fairly stable over time.

Table 4 Panel B reports the predictive ability of Model 2 in the hold-out sample.[7] Observations are ranked into deciles based on the *ex-ante* predicted probability of goodwill impairments (IPROB). The first column of results reports the mean IPROB of each portfolio. Observations in the lowest (highest) decile of IPROB on average have 4.5% (22.5%) probability of reporting goodwill impairment losses in the next 12 months. The last column reports the ratio of actual impaired observations in each decile divided by total impaired observations in the hold-out sample (N=1,168). The results are similar to those of the "full model" reported in Hayn and Hughes (2006), which includes many additional predictors of goodwill impairments.

To investigate whether investors fully anticipate the likelihood of impairments, Table 5 reports size-adjusted stock returns (BHAR) for portfolios formed on IPROB in the hold-out sample. The results show that BHAR is significantly positive for firms in lower deciles of IPROB, consistent with investors overestimating impairment probability of these portfolios. For

[7] The results of Model 1 are similar.

example, mean BHAR is 2.1% (t=1.62) and 4.9% (t=3.74) for firms in decile 1 and 2, respectively. On the other hand, BHAR is significantly negative for firms in higher deciles of IPROB, especially in the top decile (mean BHAR= -10.7%; t= -6.49). A trading strategy that takes a long position in firms in the lowest decile of IPROB and an equal valued short position in firms in the highest decile of IPROB yields 12.8% abnormal return (t=6.10). Overall the results in this section provide strong evidence against Hypothesis 3.

4.5 Sensitivity tests

The results in previous section show that investors do not appear to fully anticipate the implications of inflated earnings and goodwill balances on future impairments. Abnormal return can be obtained by trading on the ex-ante predicted probability of goodwill impairments. However, by applying the coefficients obtained in the estimation sample to observations in the hold-out sample, we implicitly assume that the relation between goodwill impairments and the predictors are stable over time. In addition, logistic regression assumes linear relation between independent variables and the log odds (logit) of dependent variable. When the assumption of linearity in the logits is violated, logistic regression will underestimate the degree of relationship between the independent variables and the dependent variable, thus lacking power, (i.e. generating Type II errors).

To relax these restrictions, we use a simpler method to construct portfolios. As results in Table 2 and Table 3 show, the likelihood of reporting goodwill impairments is significantly higher for firms with extremely high goodwill balances and extremely low earnings. Therefore, we construct our portfolios based on the ranking of these two variables. Each year, observations are independently ranked into deciles based on ROA_t and GTA_t. Table 6 Panel A reports the

mean likelihood of future goodwill impairments ($IMPDUM_{t+1}$) by ROA_t and GTA_t deciles. Consistent with the results in Table 2 and Table 3, the likelihood of reporting goodwill impairments over the next 12 months increases in GTA_t and decreases in ROA_t. Observations in decile 10 of GTA_t *and* decile 1 of ROA_t on average have 27.4% probability of reporting an impairment, the highest among all combinations. Table 6 Panel B reports mean future size-adjusted returns ($BHAR_{t+1}$) by ROA_t and GTA_t deciles. The results show that there is no observable monotonic relation between $BHAR_{t+1}$ and ROA_t or GTA_t alone. Trading strategies based on independent ranking of ROA_t or GTA_t do not consistently generate positive abnormal returns, suggesting that neither ROA_t nor GTA_t alone can help predict the likelihood of goodwill impairments beyond the information contained in stock returns. However, the combination of decile 10 GTA_t and decile 1 ROA_t yields -23.6% size-adjusted returns, consistent with the existence of unanticipated goodwill impairments in this category.

The evidence in Table 6 confirms that information in ROA_t and GTA_t is best combined together to predict future goodwill impairments. We define a dummy variable $NDUM_t$, which is equal to one for observations with ROA_t in decile 1 and GTA_t in decile 10 (high probability sample), and zero for observations with ROA_t above median and GTA_t below median (low probability sample).

Table 7 Panel A reports the descriptive statistics of NDUM samples. The results show that future impairments occur for 27.4% of firms in the high probability sample versus only 5% of firms in the low probability sample. Goodwill on average accounts for 51.4% of total assets in the high probability sample versus only 3.6% in the low probability sample. In addition, firms in the high probability sample experience significant losses (mean ROA=-0.248), while firms in the low probability sample are profitable on average (mean ROA=0.134). Panel B reports future

size-adjusted returns of NDUM samples. The hedge returns from taking a long position in the low probability sample and a short position in the high probability sample are 29.4% (t=6.76) when observations are pooled together, and 33.0% (t=2.62) when calculated using the Fama-MacBeth method. Figure 4 provides evidence on the stability of the abnormal returns to the trading strategy. It shows that the strategy is consistently profitable and yields positive returns in 7 out of the 8 years in the sample.

Figure 5 plots cumulative size-adjusted returns for NDUM samples over the 12-month period starting from earnings announcement date. NDUM samples are constructed using quarterly data. Consistent with results using annual data, the market value of firms with NDUM=1 declines significantly after portfolio formation. The cumulative size-adjusted return over the 12-month period for this sample is -19.1%. The hedge return of the trading strategy that takes a long position in firms with NDUM=0 and a short position in firms with NDUM=1 is 24.5%. The results are very close to those reported in Table 7 which uses annual data.

5. Conclusion

FAS 142 replaces the systematic amortization of goodwill with a periodic impairment test. In this study, we examine the impact of this standard on the accounting for and valuation of goodwill. We show that the new accounting standard leads to inflated goodwill balances, untimely impairments and increased earnings volatility. Goodwill impairments tend to be the highest when pre-goodwill impairment operating margins are the lowest, suggesting that goodwill impairments occur when the benefits generated by the goodwill have already expired. The evidence indicates that managers do not match costs of goodwill with its benefits. Instead, goodwill impairments are delayed until the value of goodwill has expired.

The FASB claims that financial statements after FAS 142 will better reflect the underlying economics of goodwill and other intangible assets, and the enhanced disclosures in FAS 142 will improve financial statement users' ability to assess future profitability and cash flows. However, we find that goodwill impairments lag deteriorating operating performance and stock returns by at least two years. Furthermore, the announcements of goodwill impairments elicit little market response. The evidence suggests that goodwill impairment decisions by management are not a timely reflection of the changes in estimated future underlying cash flows but rather a delayed response to the almost complete exhaustion of the goodwill.

Finally, we examine the impacts of inflated earnings and goodwill balances on investors' pricing of stocks in order to see whether there is any real cost of the accounting discretion granted by FAS 142. Investors do not appear to fully anticipate predictable goodwill overstatements, since we show that firms with deteriorating operating performance and large goodwill balances have predictable future impairments and negative abnormal stock returns. Overall, our results suggest that management exploit the discretion afforded by FAS 142 to temporarily overstate goodwill, earnings and stock prices.

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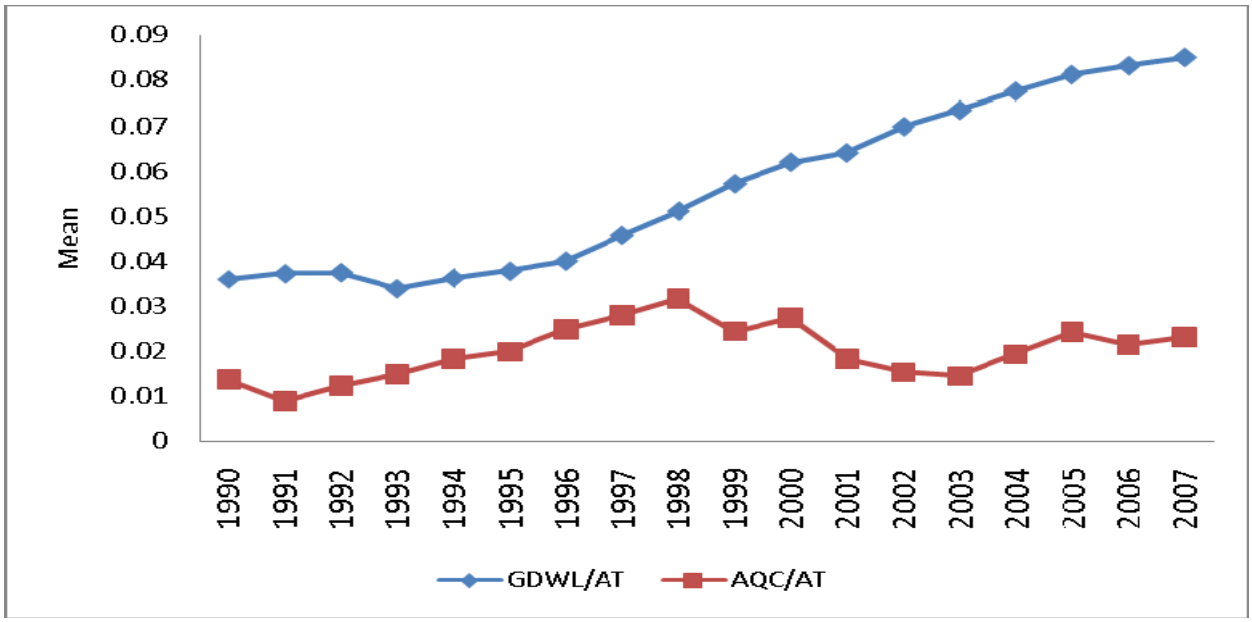
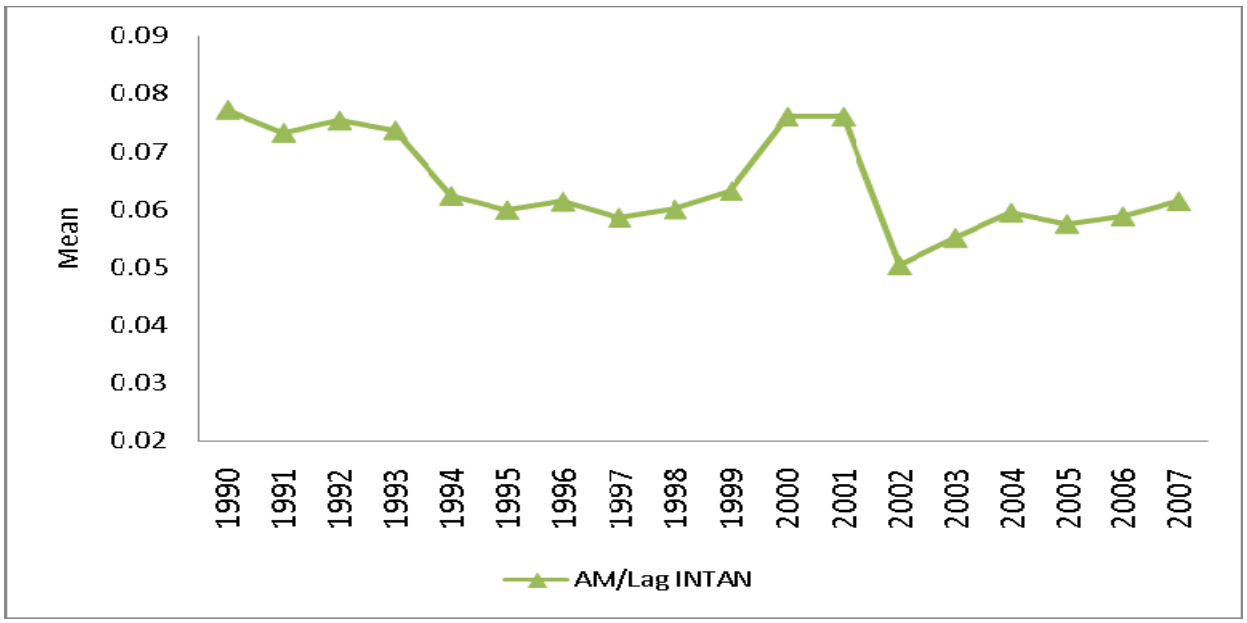
Figure 1

Panel A, Time-series trend of goodwill and acquisition, scaled by total assets.



The figure plots the cross-sectional mean of goodwill (GDWL) and acquistions (AQC), scaled by total assets (AT) from 1990 to 2007.

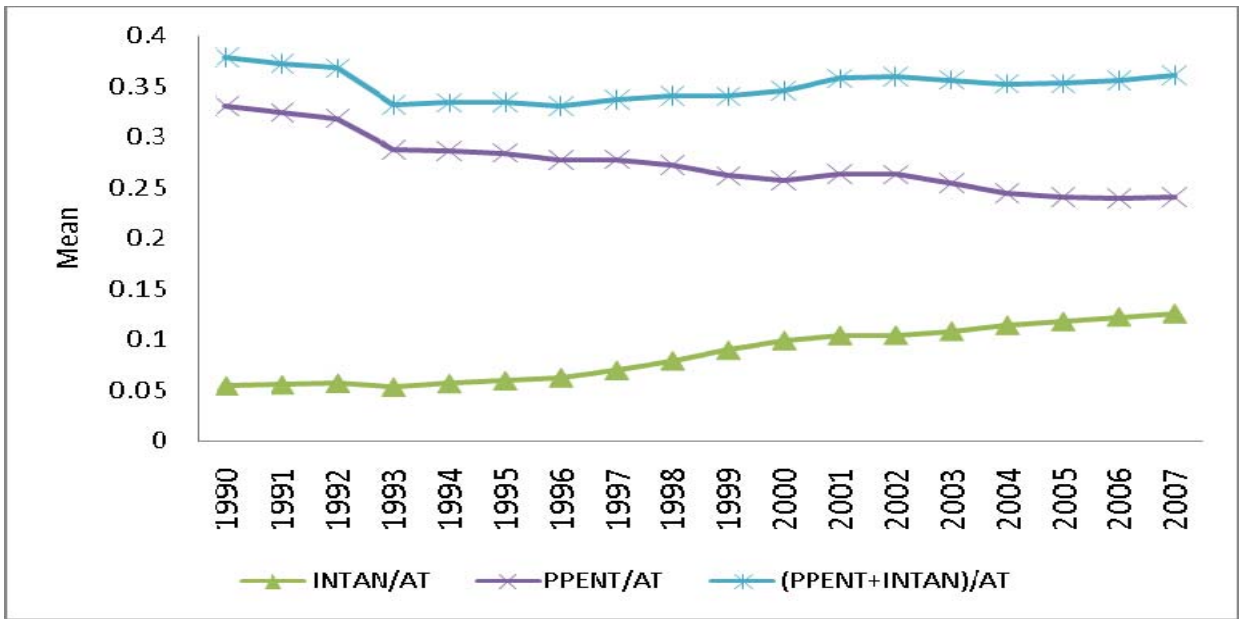
Panel B, Time-series trend of amortization expenses scaled by beginning balance of intangible assets



The figure plots the cross-sectional mean of amortization of intangibles (AM) scaled by beginning balance of intangible assets (INTAN) from 1990 to 2007.

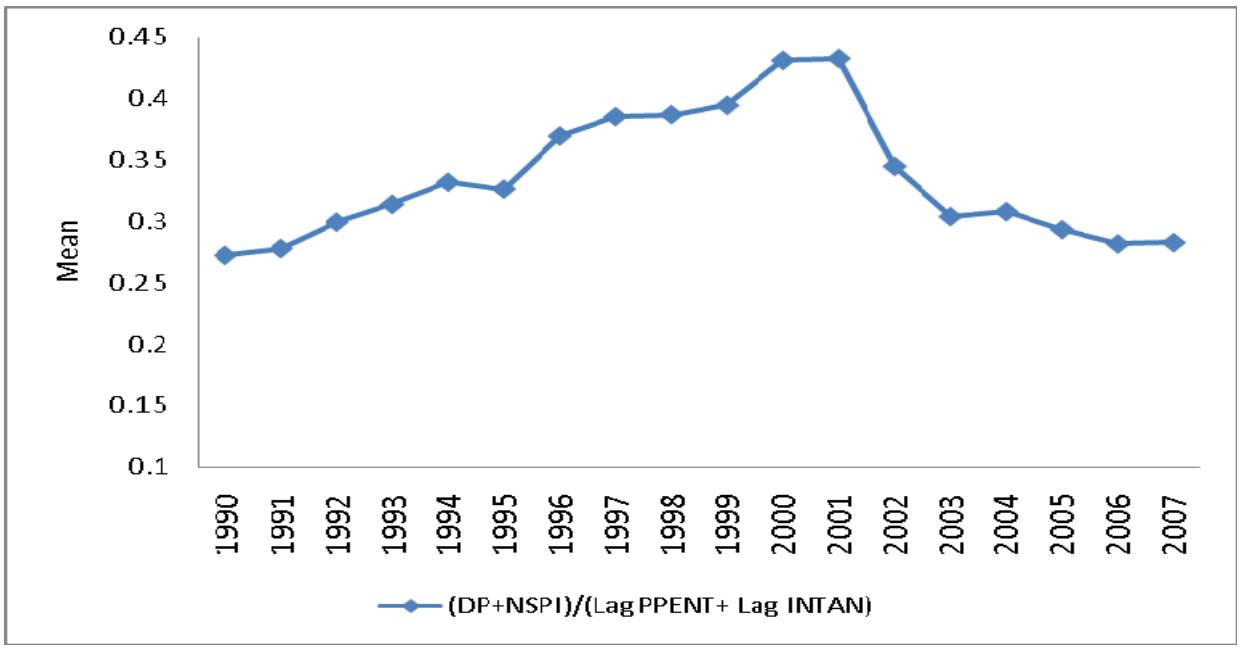
Figure 1, continued

Panel C, Time-series trend of intangible assets and property plant and equipemnt, scaled by total assets



The figure plots the cross-sectional mean of intangible assets (INTAN) and property plant and equipemnt (PPENT), scaled by total assets (AT) from 1990 to 2007.

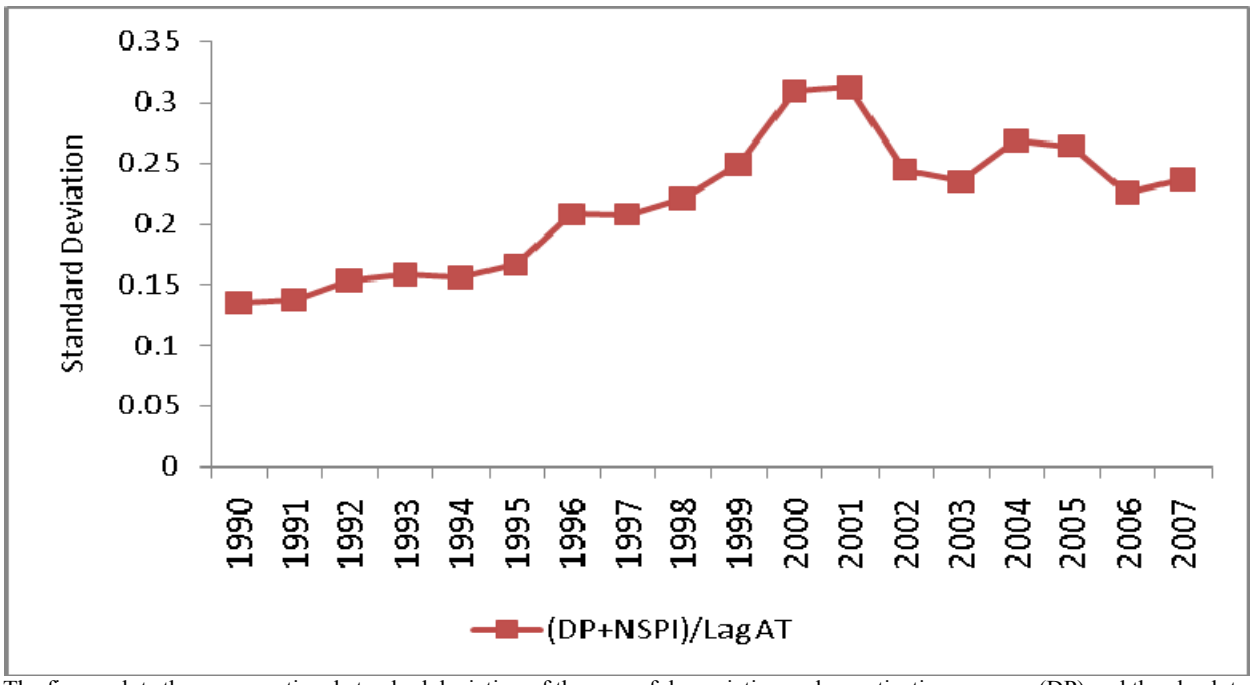
Panel D, Time-series trend of the sum of depreciation and amortization and negative special items, scaled by beginning balance of intangible assets and property plant and equipement



The figure plots the cross-sectional mean of the sum of depreciation and amortization expense (DP) and the absolute value of negative special items (SPI), scaled by beginning balance of intangible assets (INTAN) and property plant and equipemnt (PPENT) from 1990 to 2007.

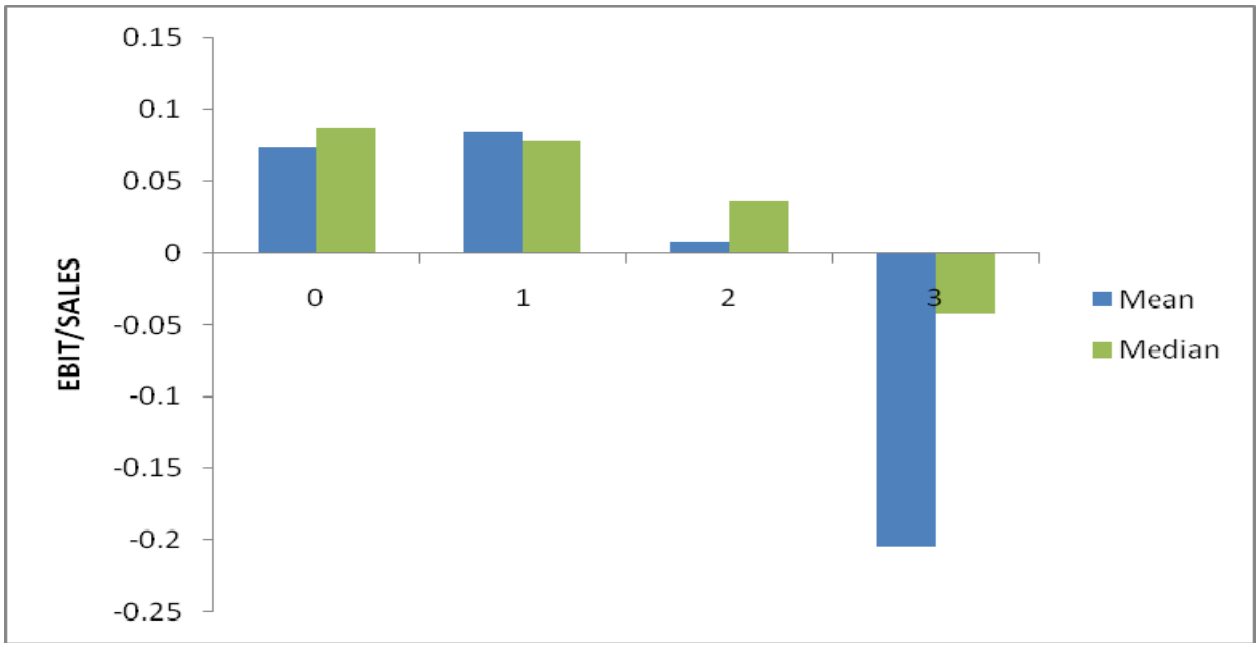
Figure 1, continued

Panel E, Cross-sectional volatility of the sum of depreciation and amortization and negative special items, scaled by beginning balance of total assets.



The figure plots the cross-sectional standard deviation of the sum of depreciation and amortization expense (DP) and the absolute value of negative special items (SPI), scaled by beginning balance of total assets (AT) from 1990 to 2007.

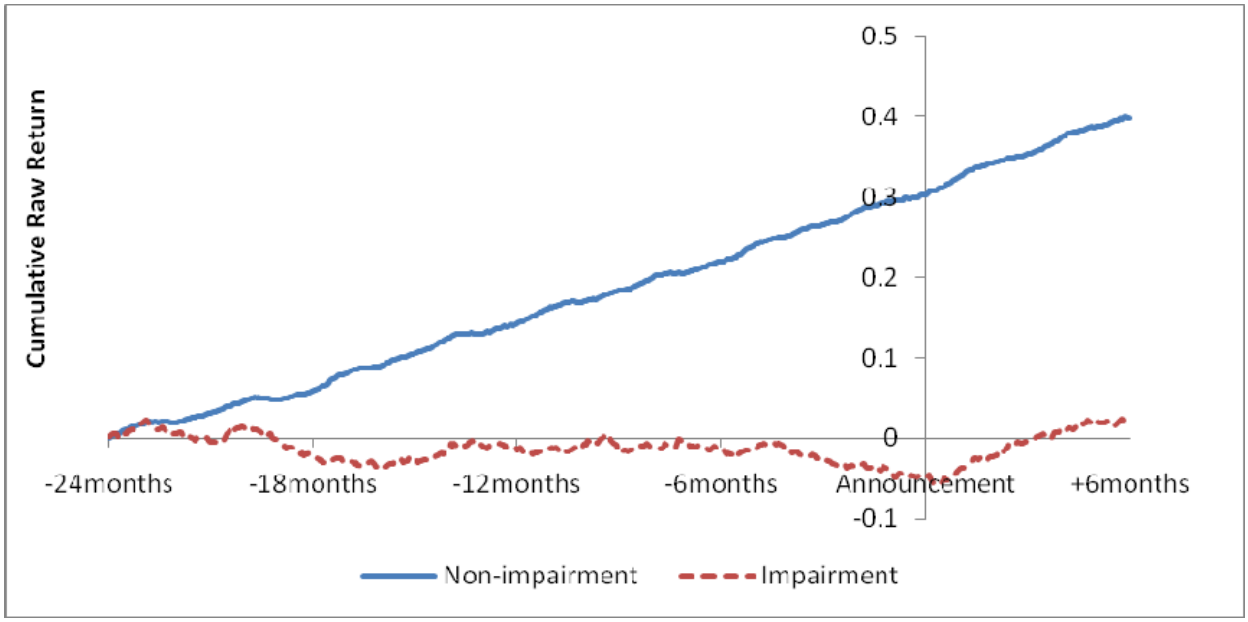
Figure 2, Mean and median operating income by groups formed on goodwill impairment losses



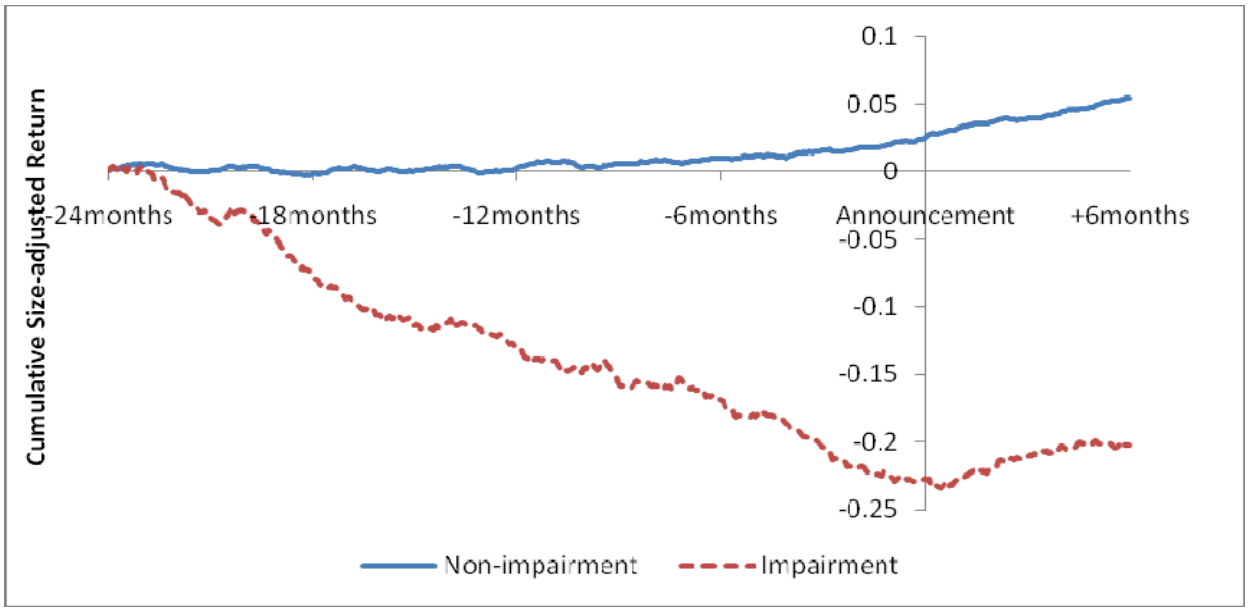
The figure plots the mean and median operating income after depreciation (OIADP) scaled by sales (SALE) for groups formed on goodwill impairment losses. The groups are as follows. Observations with zero goodwill impairments are in group 0. Observations with non-zero goodwill impaimrent losses are assigned to terciles each year based on goodwill impairment pretax amount (-1*GDWLIP) scaled by sales.

Figure 3, Stock returns over the 30-month period starting 24 months prior to earnings announcement date of impairment and non-impairment samples

Panel A, Cumulative raw return

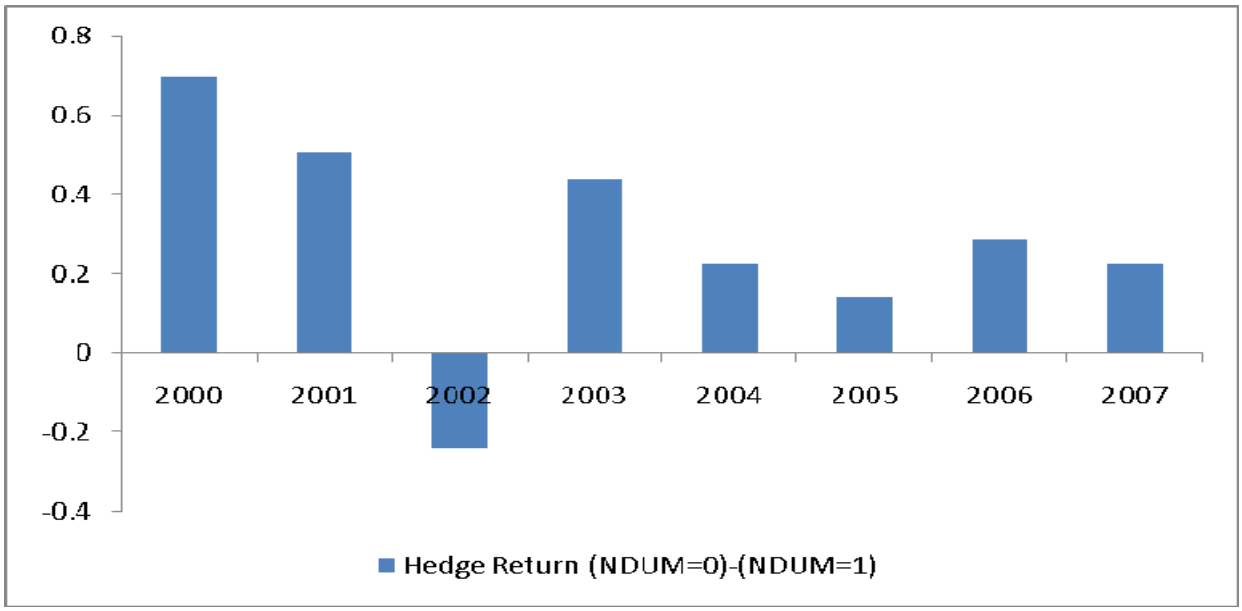


Panel B, Cumulative size-adjusted return



The figures plot cumulative raw return and size-adjusted return over the 30-month period starting 24 months prior to earnings announcement date (RDQ) in Xpressfeed fundamental quarterly database for goodwill impairment and non-impairment samples.

Figure 4, Annual hedge returns of trading strategy based on NDUM.



The figure plots annual hedge returns of taking a long position in observations with NDUM=0 and a short position in observations with NDUM=1. $NDUM_t$ is a dummy variable that is equal to one for observations in ROA decile 1 and GTA decile 10, and zero for observations with ROA above the median and GTA below the median.

Figure 5, Size-adjusted returns over the 18-month period starting from earnings announcement date of NDUM samples

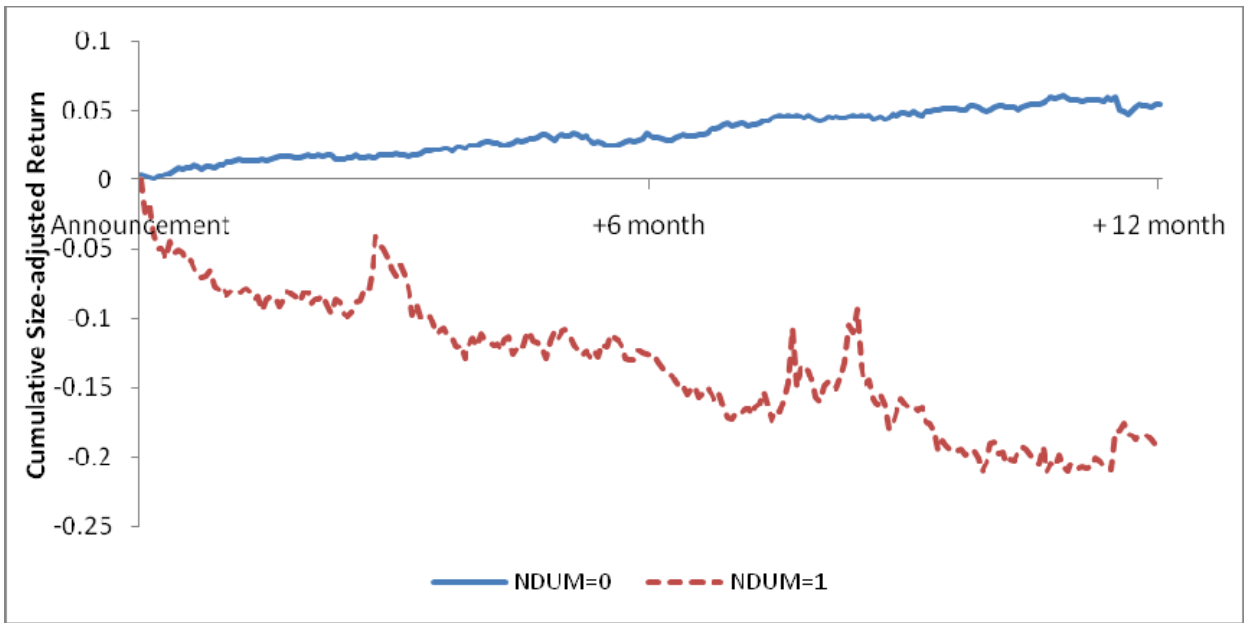


Table 1, Evidence of delayed goodwill impairments

Panel A, Pearson (above diagonal) / Spearman (below diagonal) correlations between goodwill impairment loss and pre-impairment operating margin

Variable	IMP_t	$EBIT_t$
IMP_t	1.000	-0.196
	-	(0.001)
$EBIT_t$	-0.134	1.000
	(0.001)	-

IMP_t is impairment of goodwill pretax multiplying by minus one (-1*GDWLIP) divided by sales (SALE). $EBIT_t$ is operating income after depreciation (OIADP) divided by sales (SALE). Numbers in parentheses are corresponding p-value.

Panel B, Distribution of goodwill impairment loss as a percentage of goodwill balance at the beginning of the year

Distribution of $IMP2GW_{t+1}$						
Min	10%	25%	Median	75%	90%	Max
0.000	0.011	0.051	0.263	0.724	1.000	1.000

The sample for this table is restricted to firms with non-zero goodwill impairments in year t+1, which includes 2,154 firm-year observations. $IMP2GW_{t+1}$ is impairment of goodwill pretax multiplying by minus one (-1*GDWLIP) in year t+1 divided by goodwill balance (GDWL) at the beginning of year t+1. The ratio is winsorized at 1.

Table 2, Summary statistics of indicators of goodwill impairments

Panel A, Descriptive statistics

	$IMPDUM_{t+1}$=1 (N=2,154)		$IMPDUM_{t+1}$=0 (N=21,070)		Difference	
Variable	Mean	Median	Mean	Median	Mean	Median
GTA_t	0.195	0.151	0.136	0.082	0.059	0.069
					(15.63)	(17.78)
ROA_t	-0.004	0.034	0.052	0.061	-0.056	-0.027
					(-16.21)	(-17.84)
ΔROA_t	-0.016	-0.004	0.001	0.001	-0.017	-0.004
					(-7.43)	(-9.97)
DUM_t	0.117	0.000	0.037	0.000	0.080	-
					(11.33)	-
RET_t	-0.048	-0.153	0.224	0.091	-0.272	-0.244
					(-13.27)	(-21.62)

Panel B, Pearson (above diagonal) / Spearman (below diagonal) correlations

Variable	$IMPDUM_{t+1}$	GTA_t	ROA_t	ΔROA_t	DUM_t	RET_t
$IMPDUM_{t+1}$	1.000	0.115	-0.125	-0.060	0.112	-0.089
GTA_t	0.117	1.000	-0.018	0.015	0.393	-0.038
ROA_t	-0.117	0.116	1.000	0.256	-0.326	0.075
ΔROA_t	-0.065	0.003	0.220	1.000	-0.015	0.181
DUM_t	0.112	0.305	-0.304	-0.031	1.000	-0.045
RET_t	-0.149	-0.060	0.205	0.247	-0.107	1.000

$IMPDUM_{t+1}$ is a dummy variable that is equal to one if year t+1's impairment of goodwill pretax (GDWLIP) is negative, and zero otherwise. GTA_t is goodwill (GDWL) divided by total assets (AT). ROA_t is operating income after depreciation (OIADP) divided by total assets (AT). ΔROA_t is change of ROA from year t-1 to year t. DUM_t is a dummy variable that is equal to one for observations in the top quintile of GTA *and* bottom quintile of ROA, and zero otherwise. RET_t is contemporaneous stock return over the 12-month period starting three months after the end of fiscal year t-1. Numbers in the parentheses are t-statistic (Wilcoxon z-statistic) for difference in mean (median).

Table 3, Fama-MacBeth logistic regression results of predicting goodwill impairments

$$IMPDUM_{t+1} = \alpha + \beta_1 GTA_t + \beta_2 ROA_t + \beta_3 \Delta ROA_t + \beta_4 DUM_t + \beta_5 RET_t + \varepsilon_{t+1}$$

		Fama-MacBeth Logistic Regression (No. of Regressions: 8)	
Variables	Predicted Sign	Model 1	Model 2
GTA_t	+	1.852***	2.047***
		(11.30)	(17.25)
ROA_t	-	-1.549***	-2.117***
		(-5.85)	(-9.18)
ΔROA_t	-	-0.393	-0.905**
		(-0.77)	(-2.42)
DUM_t	+	0.195***	0.216***
		(3.56)	(3.78)
RET_t	-	-0.917***	
		(-4.55)	
INTERCEPT	?	-2.684***	-2.630***
		(-24.33)	(-19.66)
Average number of observations per year		2,903	2,903
Average LR p-value		0.000	0.000
Average % concordance		69%	65%

This table presents the results of annual logistic regression estimation of Equation (1). $IMPDUM_{t+1}$ is a dummy variable that is equal to one if year t+1's impairment of goodwill pretax (GDWLIP) is negative, and zero otherwise. GTA_t is goodwill (GDWL) divided by total assets (AT). ROA_t is operating income after depreciation (OIADP) divided by total assets (AT). ΔROA_t is change of ROA from year t-1 to year t. DUM_t is a dummy variable that is equal to one for observations in the top quintile of GTA *and* bottom quintile of ROA, and zero otherwise. RET_t is contemporaneous stock return over the 12-month period starting three months after the end of fiscal year t-1. The sample covers goodwill impairments from 2000 to 2007. There are 8 annual regressions. Reported coefficients and t-statistic (in parentheses) are derived using the Fama and MacBeth (1973) procedure. ***, **, * denote significance at 0.01, 0.05 and 0.10 level using a two-tailed t-test.

Table 4, Out-of-sample predictive ability of indicators of goodwill impairments

Panel A, Pooled logistic regression results in the estimation sample (2000-2003)

		Pooled Logistic Regression (No. of Obs.: 10,011)	
Variables	Predicted Sign	Model 1	Model 2
GTA_t	+	1.834	2.185
		(0.000)	(0.000)
ROA_t	-	-2.187	-2.615
		(0.000)	(0.000)
ΔROA_t	-	-0.609	-0.992
		(0.082)	(0.003)
DUM_t	+	0.303	0.285
		(0.049)	(0.043)
RET_t	-	-0.787	
		(0.000)	
INTERCEPT	?	-2.628	-2.581
		(0.000)	(0.000)
Pseudo R^2		0.110	0.081
Likelihood ratio p-value		0.000	0.000
% concordance		72%	68%

Panel B, Predictive ability of Model 2 in the hold-out sample (2004-2007)

Portfolio Ranking on $IPROB_t$	N	Mean $IPROB_t$	% of Total Actual Impairments (N=1,168)
Lowest	1,321	4.5%	4.3%
2	1,321	5.8%	5.8%
3	1,322	6.4%	6.2%
4	1,321	6.8%	6.1%
5	1,321	7.1%	7.8%
6	1,322	7.7%	10.4%
7	1,321	8.6%	12.8%
8	1,322	10.0%	13.3%
9	1,322	12.3%	15.2%
Highest	1,320	22.5%	18.2%
Whole Sample	13,213	9.2%	100.0%

$IMPDUM_{t+1}$ is a dummy variable that is equal to one if year t+1's impairment of goodwill pretax (GDWLIP) is negative, and zero otherwise. GTA_t is goodwill (GDWL) divided by total assets (AT). ROA_t is operating income after depreciation (OIADP) divided by total assets (AT). ΔROA_t is change of ROA from year t-1 to year t. DUM_t is a dummy variable that is equal to one for observations in the top quintile of GTA *and* bottom quintile of ROA, and zero otherwise. RET_t is contemporaneous stock return over the 12-month period starting three months after the end of fiscal year t-1. Numbers in the parentheses are p-value. $IPROB_t$ is the predicted probability of goodwill impairments within the next 12 months generated from Model 2.

Table 5, Size-adjusted returns to portfolios formed on ex ante predicted probability of goodwill impairments

Portfolio Ranking on $IPROB_t$	No. of Obs.	Mean $BHAR_{t+1}$	t-statistic	p-value
Lowest	1,321	0.021	1.62	0.106
2	1,321	0.049	3.74	0.000
3	1,322	0.011	0.96	0.335
4	1,321	0.002	0.16	0.874
5	1,321	0.003	0.33	0.745
6	1,322	0.007	0.58	0.563
7	1,321	0.014	1.10	0.273
8	1,322	0.025	1.72	0.086
9	1,322	-0.023	-1.63	0.102
Highest	1,320	-0.107	-6.49	0.000
Low-High		0.128	6.10	0.000

$IPROB_t$ is the predicted probability of goodwill impairments within the next 12 months generated from Model 2. $BHAR_{t+1}$ is buy-hold size-adjusted stock return over the 12-month period starting three months after the end of fiscal year t.

Table 6, Likelihood of goodwill impairments and future size-adjusted returns by ROA and GTA deciles

Panel A, Mean likelihood of future goodwill impairments ($IMPDUM_{t+1}$) by ROA and GTA deciles

	GTA Deciles										
ROA Deciles	1	2	3	4	5	6	7	8	9	10	All GTA Deciles
1	0.132	0.104	0.156	0.093	0.160	0.145	0.228	0.234	0.203	0.274	0.184
2	0.076	0.059	0.138	0.107	0.126	0.127	0.138	0.183	0.204	0.272	0.142
3	0.025	0.053	0.070	0.054	0.087	0.167	0.159	0.073	0.170	0.203	0.074
4	0.032	0.053	0.034	0.082	0.120	0.102	0.104	0.142	0.194	0.213	0.082
5	0.044	0.019	0.082	0.082	0.086	0.112	0.155	0.104	0.148	0.181	0.102
6	0.026	0.065	0.063	0.055	0.075	0.103	0.081	0.096	0.131	0.161	0.091
7	0.059	0.056	0.072	0.061	0.076	0.068	0.070	0.104	0.144	0.091	0.086
8	0.028	0.047	0.047	0.063	0.042	0.051	0.086	0.049	0.095	0.092	0.064
9	0.050	0.033	0.024	0.051	0.056	0.083	0.050	0.077	0.068	0.051	0.057
10	0.067	0.035	0.030	0.023	0.045	0.051	0.044	0.065	0.073	0.042	0.046
All ROA Deciles	0.045	0.051	0.070	0.067	0.086	0.096	0.107	0.113	0.138	0.154	

Panel B, Mean future size-adjusted returns ($BHAR_{t+1}$) by ROA and GTA deciles

	GTA Deciles												
ROA Deciles	1	2	3	4	5	6	7	8	9	10	All GTA Deciles	GTA 1-10	t-statistic
1	-0.055	0.082	-0.103	0.083	0.067	0.005	-0.189	-0.122	-0.041	-0.236	-0.064	0.182	(1.89)
2	-0.077	0.038	0.010	-0.012	0.012	0.026	0.001	-0.035	-0.083	-0.146	-0.025	0.069	(1.11)
3	-0.006	0.017	0.029	-0.062	-0.003	-0.052	0.021	-0.084	0.057	-0.067	-0.004	0.061	(1.01)
4	0.017	0.077	0.010	0.007	0.018	-0.034	-0.007	0.048	-0.006	0.000	0.021	0.017	(0.36)
5	0.049	-0.006	0.063	0.064	0.094	0.008	0.045	0.007	-0.049	-0.010	0.027	0.059	(1.09)
6	0.081	0.128	0.153	0.102	0.056	0.033	0.103	0.087	0.075	0.015	0.079	0.066	(1.35)
7	0.030	0.092	0.170	0.042	0.010	0.035	0.043	0.071	0.010	-0.003	0.043	0.033	(0.70)
8	0.071	0.113	0.023	0.043	0.070	0.059	0.016	0.049	0.008	-0.017	0.037	0.089	(1.37)
9	0.079	0.070	0.027	0.021	0.058	0.046	0.070	0.024	0.057	0.045	0.048	0.034	(0.55)
10	0.072	0.046	-0.053	0.026	0.031	0.016	0.017	0.032	0.047	0.005	0.021	0.066	(1.28)
All ROA Deciles	0.014	0.056	0.028	0.031	0.044	0.020	0.012	0.014	0.010	-0.046			
ROA 10-1	0.127	-0.036	0.050	-0.057	-0.035	0.011	0.205	0.154	0.088	0.242			
t-statistic	(1.17)	(-0.34)	(0.55)	(-0.67)	(-0.32)	(0.12)	(3.87)	(2.19)	(0.91)	(4.11)			

$IMPDUM_{t+1}$ is a dummy variable that is equal to one if next year's impairment of goodwill pretax (GDWLIP) is negative, and zero otherwise. GTA_t is goodwill (GDWL) divided by total assets (AT). ROA_t is operating income after depreciation (OIADP) divided by total assets (AT). $BHAR_{t+1}$ is buy-hold size-adjusted stock return over the 12-month period starting three months after the end of fiscal year t.

Table 7, Sensitivity tests on the predictive ability of GTA and ROA with respect to future goodwill impairments

Panel A, Descriptive statistics by NDUM samples

Sample	No. of Obs.	Mean $IMPDUM_{t+1}$	Mean GTA_t	Mean ROA_t
$NDUM_t$=0 ($RROA_t$>=6 and $RGTA_t$<=5)	4,884	0.050	0.036	0.134
$NDUM_t$=1 ($RROA_t$=1 and $RGTA_t$=10)	336	0.274	0.514	-0.248

Panel B, Future size-adjusted returns by NDUM samples

Pooled method

Sample	No. of Obs.	Mean $BHAR_{t+1}$	t-statistic	p-value
$NDUM_t$=0 ($RROA_t$>=6 and $RGTA_t$<=5)	4,884	0.058	6.04	0.000
$NDUM_t$=1 ($RROA_t$=1 and $RGTA_t$=10)	336	-0.236	-5.57	0.000
($NDUM_t$=0)-($NDUM_t$=1)		0.294	6.76	0.000

Fama-MacBeth method

Sample	No. of Years	Mean $BHAR_{t+1}$	t-statistic	p-value
$NDUM_t$=0 ($RROA_t$>=6 and $RGTA_t$<=5)	8	0.063	3.22	0.015
$NDUM_t$=1 ($RROA_t$=1 and $RGTA_t$=10)	8	-0.267	-2.46	0.043
($NDUM_t$=0)-($NDUM_t$=1)		0.330	2.62	0.034

$IMPDUM_{t+1}$ is a dummy variable that is equal to one if next year's impairment of goodwill pretax (GDWLIP) is negative, and zero otherwise. GTA_t is goodwill (GDWL) divided by total assets (AT). ROA_t is operating income after depreciation (OIADP) divided by total assets (AT). $RROA_t$ and $RGTA_t$ are decile rankings of ROA_t and GTA_t, respectively. $NDUM_t$ is a dummy variable that is equal to one for observations with $RROA_t$=1 and $RGTA_t$=10, and zero for observations with $RROA_t$>=6 and $RGTA_t$<=5. $BHAR_{t+1}$ is buy-hold size-adjusted stock return over the 12-month period starting three months after the end of fiscal year t.