Economic consequences of SFAS 142 goodwill write-offs

Henry Jarva

Oulu Business School, University of Oulu, 90014 Oulu, Finland

Abstract

This paper examines the economic consequences of goodwill write-offs under Statement of Financial Accounting Standards No. 142 (SFAS 142). Although write-off firms have performed poorly, it is evident that deteriorating economic performance explains only a small proportion of write-offs. After controlling for endogeneity of write-off choice, I fail to find evidence that investors and analysts fixate on SFAS 142 goodwill write-offs. I also provide evidence that write-off firms pay higher audit fees, suggesting that auditors charge higher fees in response to extra audit effort. These results are consistent with the principles of market efficiency, analyst-forecast rationality and efficient audit pricing.

Key words: Audit fees; Conditional conservatism; Fair-value accounting; Market efficiency; Propensity score matching

JEL classification: G14, M41, M48

doi: 10.1111/j.1467-629X.2012.00495.x

1. Introduction

In 2001, the U.S. Financial Accounting Standards Board (FASB) issued new business combination standards that abolished pooling in favour of purchase accounting (Statement of Financial Accounting Standards (SFAS) No. 141) and

I appreciate the helpful comments from Peter Clarkson, Seppo Ikäheimo, Juha Joenväärä, Juha-Pekka Kallunki, Petri Kyröläinen, Petri Sahlström, Richard Sloan, Mikko Zern, the anonymous referees and seminar participants at the University of Oulu and the University of Eastern Finland. I gratefully acknowledge financial support from the Tauno Tönning Foundation, the Foundation for Economic Education and the Jenny and Antti Wihuri Foundation. All errors are my own.

Received 19 March 2011; accepted 17 June 2012 by Peter Clarkson (Editor).

© 2012 The Author
Accounting and Finance © 2012 AFAANZ
changed goodwill amortization to goodwill impairment testing (SFAS 142). These new business combinations standards are consistent with the FASB’s fundamental conceptual shift towards the broad-based adoption of fair-value accounting. However, several scholars have expressed dissatisfaction with the adoption of the new accounting standards for goodwill and the conceptual move to unverifiable fair values in general.

The use of the impairment-only approach to goodwill, the large dollar amounts involved and the potential managerial discretion involved in goodwill write-offs necessitates a careful analysis of their economic consequences. I attempt to ascertain how write-off firms would have performed had they foregone the write-offs. I examine a wide range of outcome variables, including long-term stock returns, changes in the implied (ex ante) cost of equity capital, analyst earnings forecasts and audit fees. These linkages should reflect, among other things, the information included in goodwill write-offs and market participants’ perceptions of firm fundamentals. The results should be of interest to investors and accounting standard-setters, including the International Accounting Standards Board.

I examine a sample of 280 material SFAS 142 goodwill write-offs from the period from 2002 to 2005. Write-off firms tend to have performed very poorly in the year in which the goodwill write-off is reported: they exhibit poor stock price

---

1 Goodwill accounting is now covered in FASB Accounting Codification Section (ASC) 350, whereas business combinations are covered in ASC 805. Note that the International Financial Reporting Standards (IFRS) have similar treatment to goodwill (see IFRS 3: 'Business Combinations' and IAS 36: 'Impairment of Assets').

2 Verifiability is the ability through consensus among measures to ensure that information represents what it purports to represent or that the chosen measurement method has been used without error or bias (Holthausen and Watts, 2001). Holthausen and Watts (2001) argue that once unverifiable numbers are included in the financial statements, the incentive to misrepresent increases and if the numbers are not verifiable they could become useless for decision-making and unrelated to stock prices. Watts (2003) expresses concern that SFAS 142 may represent an error in judgment by the FASB. Dichev (2008) argue that the focus on balance sheets in accounting standard-setting is flawed, mainly because the model does not reflect business realities. Kothari et al. (2010) caution against expanding fair-value measurement to balance sheet items for which liquid markets do not exist.

3 Similar to U.S. GAAP, under IFRS goodwill must be periodically evaluated for impairment. Specifically, IAS 36 Impairment of Assets identifies an impairment loss if the carrying amount of the cash-generating unit (including goodwill) exceeds the recoverable amount of the unit. Identified impairment loss is first applied against goodwill and then against other assets.

4 Material goodwill write-offs are defined as representing more than 1 per cent of beginning-of-year total assets or as >$10 million. Following Francis et al. (1996), I use the term ‘write-off’ to refer to both complete and partial downward asset revaluations. Initial adoption write-offs are excluded because of the potential effects of transition rules (see Beatty and Weber, 2006).
performance, high cost of equity, high book-to-market ratios and low earnings even in the absence of the write-off. However, the results show that the estimated probability of taking a write-off is relatively low for most of the sample firms, indicating that deteriorating economic performance explains only a low proportion of write-offs. Consistent with that of the literature (Hayn and Hughes, 2006; Li and Sloan, 2011; Ramanna and Watts, 2011), the evidence in this paper suggests that managers use the discretion afforded by SFAS 142 to avoid timely write-offs. However, based on previous studies, it is unclear whether the discretion afforded to managers creates real costs (e.g. security mispricing or higher audit fees).

The major purpose of this study is to explore the economic consequences of SFAS 142 goodwill write-offs in three ways. First, I examine whether market participants fully incorporate the information contained in SFAS 142 goodwill write-offs into stock prices. If investors functionally fixate on earnings, then goodwill write-offs may lead to significant mispricing. I show that write-off firms do not earn higher future (i.e. 1-year-ahead) stock returns than do control (non-write-off) firms. Furthermore, because a firm's stock returns are by definition driven by shocks to expected earnings and/or shocks to discount rates, I extend my analysis to changes in the implied cost of equity capital derived from analysts' earnings forecasts. I show that write-off firms do not experience a more negative change in the future cost of equity; this finding corroborates the earlier one. Thus, the evidence is consistent with the efficient market hypothesis, which states that stock prices fully reflect all publicly available information.

Second, I examine whether the implications of goodwill write-offs for future firm performance are incorporated in analysts' future earnings forecasts. Analysts are sophisticated capital market intermediaries who specialize in interpreting accounting information for market participants. I document that analyst-forecast accuracy with respect to future earnings forecasts is not lower for write-off firms than for control firms. Because analysts are able to incorporate goodwill write-offs into their forecasts, this non-price test strengthens the previous returns-based test results (i.e. market efficiency).

Finally, I examine whether goodwill write-offs are related to audit pricing. The results show that write-off firms pay higher audit fees, which suggests that auditors charge higher fees in response to the extra effort necessary or to the additional risk for the auditor. After considering the probability of write-offs, I conclude that the evidence is more consistent with the fact that accounting decisions for goodwill write-offs require additional effort on the part of auditors. Specifically, write-off firms with a high probability of impairment (and hence those whose audits require a greater degree of effort) pay higher audit fees. This finding is as expected because the impairment test in SFAS 142 implicitly requires auditors to assess the total fair value of reporting units. In sum, the results are consistent with the principles of market efficiency, analyst-forecast rationality and efficient audit pricing.

© 2012 The Author
Accounting and Finance © 2012 AFAANZ
The remainder of this paper is organized as follows. The next section briefly reviews the prior research and develops hypotheses regarding the economic consequences of SFAS 142 goodwill write-offs. Section 3 describes the research design and sample selection. Section 4 discusses the empirical results. Section 5 concludes.

2. Related research and hypotheses

2.1. Related research

The FASB issued SFAS 142, replacing SFAS 121, to provide 'better information about intangible assets' and because financial statement users 'did not regard goodwill amortization expense as being useful information in analysing investments' (Financial Accounting Standards Board, 2001). The standard eliminated goodwill amortization, requiring goodwill instead to be periodically reviewed for impairment. The goodwill impairment test under SFAS 142 requires a two-step process that begins with an estimation of the fair value of a reporting unit. The 'implied fair value' of a reporting unit's goodwill is the difference between the fair value of the reporting unit and the fair value of net assets excluding goodwill. Goodwill impairment occurs when the implied fair value of goodwill is less than its book value. Hence, the first step is to screen for potential impairment, and the second step is to measure the amount of impairment, if any. Under the previous standard, SFAS 121, an impairment test was performed for the lowest asset group with identifiable and independent cash flows using the undiscounted expected future cash-flows approach in the first step. The FASB acknowledges that the standard may increase the volatility of reported earnings because impairment losses are likely to occur irregularly and in varying amounts.

Goodwill accounting has attracted a great deal of attention from academics and policy-makers in recent years. Prior studies have indicated that goodwill write-offs lag behind the economic impairment of goodwill under both amortization and impairment regimes (Hayn and Hughes, 2006; Jarva, 2009; Li and Sloan, 2011). For example, the evidence in Li and Sloan (2011) suggests that management only take impairments once it becomes obvious that the significant benefits of goodwill have expired. In addition, a number of studies show that proxies for overpayment for targets can predict the subsequent goodwill impairment (Hayn and Hughes, 2006; Li et al., 2011).

Prior studies have also examined the reactions of market participants to the announcement of goodwill impairment losses. Bens et al. (2011) document a

\[ \text{As a result, accounting for goodwill is now less unconditionally conservative, whereas the level of conditional conservatism is expected to increase. The trade-off between unconditional and conditional conservatism is akin to the well-known trade-off between reliability and relevance.} \]

© 2012 The Author
Accounting and Finance © 2012 AFAANZ
negative stock market reaction to unexpected goodwill write-offs. The negative reaction for the high information asymmetry and larger firms weakens the following adoption of SFAS 142, which the authors interpret as supporting the critics' view that impairments under SFAS 142 are less reliable (see Watts, 2003). In a related study, Li et al. (2011) find that investors as well as financial analysts revise their expectations downward on the announcement of a goodwill impairment loss even if the price impact is lower in the post-SFAS 142 period relative to the per-SFAS 142 and transition periods.

Ramanna and Watts (2011) provide evidence that the non-impairment of goodwill increases with firm characteristics predicted to be associated with greater managerial discretion. They fail to find evidence that non-impairment is attributable to management's possession of favourable private information based on share repurchase and insider buying activity. Instead, Muller et al. (2010) find evidence of considerable share selling by corporate insiders in the 2 years preceding the formal announcement of goodwill impairment. Muller et al. (2010) argue that insiders distance their selling away from the impairments' formal release consistent with increased litigation risk.

A final set of studies examine future performance measures and provide evidence supporting the proponents of SFAS 142. Godfrey and Koh (2009) find that write-offs are negatively associated with firms' underlying investment opportunities. Jarva (2009) provides evidence that goodwill write-offs are associated with future expected cash flows as mandated by SFAS 142 (except for firms with contemporaneous restructuring). Lee (2011) finds that the ability of goodwill balance to predict future cash flows has improved since the FASB adopted SFAS 142.

Although somewhat mixed, the above evidence suggests that the flexibility afforded by SFAS 142 allows managers to use accounting discretion opportunistically. However, none of the above studies examines the economic consequences of SFAS 142 goodwill write-offs although there are several related studies. Specifically, I examine whether the market participants fully reflect the information contained in SFAS 142 goodwill write-offs and whether write-off firms pay higher audit fees. Next, I develop hypotheses for those firms that report material goodwill write-offs.

2.2. Hypotheses development

My first hypothesis with respect to market efficiency is straightforward. I hypothesize that the market fully reflects the information contained in SFAS 142 goodwill write-offs. Goodwill write-offs do not affect firm cash flows per se but may affect market participants' assessments of a firm's expected future cash flows. Sloan (1996) shows that stock prices act as if investors fixate on earnings, failing to fully reflect information contained in the accrual and cash-flow components of current earnings until that information impacts on future earnings. Furthermore, Dechow and Ge (2006) show that special item low accrual firms have higher future stock returns than do other low accrual firms. Thus, goodwill

© 2012 The Author
Accounting and Finance © 2012 AFAANZ
write-offs may generate positive ‘abnormal’ returns if investors fixate on earnings. Following the above studies, I attempt to ascertain the potential mispricing effect by examining subsequent returns (i.e. reversals of initial overreactions). As noted above, I hypothesize that goodwill impairment firms do not have higher subsequent stock returns than control firms. This hypothesis can be stated in an alternative form as follows:

*H1a.* SFAS 142 goodwill write-off firms earn higher future returns than control firms.

The change in the cost of equity tests can be used to ascertain whether the potentially higher returns are due to earnings news or news regarding expected returns. This follows because by definition, a firm’s stock returns are driven by shocks to expected earnings and/or shocks to discount rates. I hypothesize that goodwill impairment firms do not experience a more negative change in the subsequent cost of equity than do control firms. This hypothesis, in its alternative form, is as follows:

*H1b.* SFAS 142 goodwill write-off firms experience a more negative change in the future cost of equity than do control firms.

My tests assume that potential mispricing is corrected gradually in the year following the write-off year. Evaluating H1a and H1b together will provide evidence as to whether the market efficiently incorporates information in goodwill write-offs under SFAS 142.

The next hypothesis addresses the question of whether the implications of goodwill write-offs are incorporated into analysts’ future earnings forecasts.\(^6\) Note that examining future earnings forecasts allows us to avoid the issue of the potential mechanical relationship between goodwill write-offs and forecast errors.\(^7\) Management has incentives to highlight the transitory nature of write-offs, and they often claim them to be non-recurring (Dechow and Ge, 2006). Bradshaw *et al.* (2001) show that analysts’ earnings forecasts do not incorporate the predictable declines in future earnings associated with high accruals. Therefore, it is not clear whether analysts incorporate the

---

\(^6\) To the best of my knowledge, Li *et al.* (2011) is the only other study that examines the association between SFAS 142 goodwill write-offs and analyst forecasts. Li *et al.* (2011) find that analysts revise their expectations downward after the announcement of an impairment loss and the downward revision is related to the magnitude of the loss. However, Li *et al.* (2011) do not examine whether future earnings forecast accuracy deteriorates after the write-off.

\(^7\) Gu and Chen (2004) note that analyst tracking services may include or exclude certain items from street earnings on a case-by-case basis rather than on a category-by-category basis. In their sample, the percentage of goodwill write-down exclusions is 72 per cent.
implications of SFAS 142 goodwill write-offs into their future earnings forecasts.

On the one hand, if analysts believe that the poor earnings performance of firms recording impairment losses will continue, then future earnings forecasts are likely to be more pessimistic for firms writing off goodwill (even if the analysts exclude future goodwill write-offs from their forecasts). Moreover, if managers guide analysts’ forecasts downward to increase the probability of beating future forecasts, then these forecasts are also likely to be more pessimistic. On the other hand, it is possible for management to highlight the transitory nature of goodwill write-offs and signal expected improvements in future performance, causing over-optimism regarding analysts’ expectations. Finally, if goodwill write-offs are informative and analysts incorporate this information into forecasts in an unbiased manner, then it is possible that future earnings forecast accuracy will be greater for write-off firms. Which effect dominates is an empirical matter. Therefore, I use unsigned forecast error measures. I hypothesize that analysts’ forecast accuracy with regard to future earnings forecasts is not lower for write-off firms. My hypothesis is stated in its alternative form as follows:

**H2:** Analyst-forecast accuracy with respect to future earnings forecasts is lower for SFAS 142 goodwill write-off firms than for control firms.

My final hypothesis relates to auditing and more specifically to audit fees. There is a substantial body of research examining the link between audit pricing and earnings quality. For example, Gu et al. (2003) report a positive association between absolute discretionary accruals (DAs) and the audit fees of Australian listed companies. They argue that high DAs are expected to be associated with high inherent risk as assessed by firm auditors. However, there is relatively little evidence of how particular accruals and accounting choices, especially write-off decisions, affect perceived audit risk and audit pricing. A link between goodwill write-offs and audit fees can be expected because the impairment test in SFAS 142 implicitly requires auditors to assess the total fair value of reporting units — this requires greater effort. Auditors may charge clients with goodwill write-offs higher fees to cover the work accomplished. It is also plausible that goodwill write-offs carry a high litigation risk for the auditor. However, high litigation risk is relevant only for delayed write-offs because auditors are unlikely to be sued successfully for management’s poor investment decisions/performance if write-offs are recorded in a timely manner. Ultimately, whether goodwill write-offs are associated with audit fees is an empirical question. My final hypothesis, stated in alternative form, is as follows:

---

8 Note that traditional accrual models do not control for write-off-induced variation in accruals, so write-offs appear in the resulting residuals (i.e. DAs).
H3: Audit fees are larger for SFAS 142 goodwill write-off firms than for the control firms.

All my claims are supported by a failure to reject the null hypothesis of no association. The next section describes the empirical methods.

3. Empirical methodology

It is common in accounting research for sample firms to be fundamentally different from other firms. The matching approach is frequently employed to alleviate potential selection bias. Using this approach, researchers compare sample firms with non-sample firms with similar ex ante characteristics, including size, profitability, industry or growth. When there are only a few characteristics, the matching process is straightforward. However, as the number of characteristics increases, it becomes more difficult to determine along which dimensions to match units or which weighting scheme to adopt – a problem known as the 'curse of dimensionality.' In addition, it is widely recognized that an estimate of a causal effect obtained by comparing a treatment group with a non-experimental comparison group may be biased because of problems such as self-selection or due to the researcher's process of selecting the units to be assigned to the treatment group (Dehejia and Wahba, 2002).9

Rosenbaum and Rubin (1983) suggest using the propensity score to make matching feasible. The propensity score is the probability of assignment to the treatment based on the covariates (explanatory variables) available. Matching using propensity scores reduces the dimensionality of the matching problem. More importantly, this method of matching can yield unbiased estimates of the treatment effect (Dehejia and Wahba, 2002). Using propensity scores, one can estimate treatment effects in two stages. In the first stage, the selection model is estimated.10 In the second stage, the model that describes the outcomes is constructed. The method is relatively new in the accounting literature but is extensively used in many fields of study and especially in labour market policy studies. Although propensity score matching can potentially correct for sample selection bias, it should be noted that it is in no way guaranteed to solve the evaluation

---

9 The term 'treatment effect' originates from medical science and refers to the causal effect of a given treatment on an outcome variable of interest. The term 'participation' is used in labor economics. A classic example of an evaluation problem is that in which high-skilled individuals have a higher probability of entering a training programme and also have a higher probability of finding a job (Caliendo and Kopeinig, 2008).

10 The conditional probability is usually computed using a discrete choice model. Logit or probit models are preferable to the linear probability model (e.g. OLS regression) because of the well-known shortcomings of the linear probability model (Caliendo and Kopeinig, 2008).
problem in every case. To increase comparability with previous SFAS 142 studies, the second-stage model is also estimated using all control observations.

3.1. Propensity score model

The basic aim of this study is to match SFAS 142 goodwill write-off firms with control firms on the basis of their economic probability of reporting impairment write-offs. Thus, the treatment of interest is the material goodwill write-off. I define a goodwill write-off as material if it represents more than 1 per cent of the firm's beginning-of-the-year total assets or if it is larger than $10 million.\textsuperscript{11} I include variables in the first-stage selection model that are likely to be associated with the economic impairment of goodwill. Earnings level and incurring a loss before goodwill write-offs are natural performance measures (Jarva, 2009). I include a characteristic of the original acquisition(s), proportion of goodwill to total assets, because Hayn and Hughes (2006) show that acquisition indicators are more predictive of the eventual write-off than are performance indicators. I use a book-to-market indicator variable as a proxy for expected impairment (Beatty and Weber, 2006). I also attempt to capture the interaction between the goodwill balance and the expected impairment. Conservatism makes financial statements timelier in recognizing bad news than good news (Basu, 1997). For this reason, I allow asymmetry with respect to current and lagged returns (proxying for 'news') because negative returns should contain information about write-offs. Finally, I include interacted industry-year fixed effects to control for macroeconomic factors or shocks affecting a particular industry during a given year. The industry dummies are based on Jarva (2009). Specifically, I estimate the propensity scores for each firm-year observation using the following logistic model (throughout the paper, $i$ denotes the firm and $t$ denotes the year):

$$
\begin{align*}
\rho &= E(WO_{it} = 1 | \beta'X) \\
\text{logit}(\rho) &= \ln \left( \frac{\rho}{1-\rho} \right) = \beta'X \\
\beta'X &= \beta_0 + \beta_1 PreE_{it} + \beta_2 Loss_{it} + \beta_3 GW\%_{it-1} + \beta_4 BTM_{it} + \beta_5 DBTM_{it} \\
&+ \beta_6 GW\%_{it-1} \times DBTM_{it} + \beta_7 Size_{it} + \beta_8 DR_{it-1} + \beta_9 R_{it} + \beta_{10} DR_{it} \times R_{it} \\
&+ \beta_{11} DR_{it-1} + \beta_{12} R_{it-1} + \beta_{13} DR_{it-1} \times R_{it-1} + \text{Industry} \times \text{Year} + \epsilon_{it}
\end{align*}
$$

\textsuperscript{11} I concentrate on firms that take material write-offs to enhance the power of the tests. It is important to note that small write-offs may merely indicate that the goodwill carrying amount is decreasing because of the consumption of the expected stream of benefits (Li and Sloan, 2011). These write-offs are economically justified and consistent with SFAS 142.

© 2012 The Author
Accounting and Finance © 2012 AFAANZ
$WO = 1$ if the firm reports material goodwill write-offs, and 0 otherwise; $preE = $ earnings before goodwill write-offs scaled by market value of equity 3 months after the fiscal year $t-1$; $Loss = 1$ if $preE < 0$, and 0 otherwise; $GW\% = $ beginning-of-period goodwill scaled by beginning-of-period total assets; $BTM = $ ending book-to-market ratio before goodwill write-offs; $DBTM = 1$ if $BTM > 1$, and 0 otherwise; $Size = $ logarithm of the market value of equity at fiscal year end; $DR = 1$ if $R < 0$, and 0 otherwise; $R =$ annual buy-hold stock return starting 3 months after the fiscal year end; $Industry = $ industry fixed effects; and, $Year = $ year fixed effects variables.

To control for the possibility of omitted time-specific macroeconomic effects, I match control firms on a year-by-year basis. Furthermore, year-by-year matching ensures that future returns are aligned in calendar time. I perform one-to-one matching using the 'greedy matching' technique.\(^2\) I do not allow write-off firms to be used as control firms in the years before and/or after the write-off event because that may reduce the power of the empirical tests.\(^3\)

### 3.2. Outcome models

After the propensity score matching procedure, I use multivariate analyses to test whether SFAS 142 goodwill write-offs have significant economic consequences.\(^4\) To capture these effects, I include the $WO_t$ variable in the second-stage models. The control variables are based on the literature. Sloan (1996) showed that accruals are negatively correlated with future size-adjusted returns. In addition, Bradshaw et al. (2001) showed that sell-side analysts' forecast errors are large and negative for firms with unusually high accruals. For this reason, I decompose pre-write-off earnings into operating cash flows and pre-write-off accruals. I also include two Fama-French characteristics (firm size and book-to-market equity) because they have been shown to be correlated with expected returns. Specifically, I use the following model to test the H1a, H1b, and H2 hypotheses:

---

\(^{2}\) I use a local optimal (greedy) algorithm. The SAS matching algorithm used in this study was developed by Parsons (2001). This algorithm makes 'best' matches first and 'next-best' matches afterwards, and each control is selected, at most, once in a given year. Dehejia and Wahba (2002, p. 161) also describe a simple algorithm for estimating the propensity score.

\(^{3}\) The results remain unchanged when write-off firms are allowed to be used as control firms.

\(^{4}\) It should be noted that under perfect matching, using a difference in means between the treatment and comparison is sufficient to estimate the treatment effect (Dehejia and Wahba, 2002). However, I further control for potential confounding effects to remove any remaining variation that is not attributable to the treatment effect (i.e. material goodwill write-off).
\[ Z = \alpha_0 + \beta_0 WO_{it} + \beta_1 \text{preACC}_{it} + \beta_2 CF_{it} + \beta_3 \text{Size}_{it} + \beta_4 \text{BTM}_{it} + \epsilon_{it+1} \]  

(2)

\[ Z = \text{is sequentially set equal to } R_{it+1}, \Delta^\text{PEG}_{it+1}, \text{ and } FE_{it+1}; \Delta^\text{PEG} \text{ = change in cost of equity; FE = analyst earnings forecast accuracy; preACC = accruals before goodwill write-offs scaled by market value of equity 3 months after the fiscal year } t-1; \text{ and, CF = operating cash flows scaled by market value of equity 3 months after the fiscal year } t-1, \text{ where all other variables are as previously defined. Cost of equity } (\gamma^\text{PEG}) \text{ is calculated using the positive earnings growth (PEG) ratio model by Easton (2004). Analyst earnings forecast accuracy } (FE) \text{ is calculated as the absolute value of actual earnings less forecasted earnings, scaled by stock price. The coefficient on } WO, \beta_0, \text{ measures the effect of SFAS 142 goodwill write-offs on the variables of interest. Consistent with hypotheses H1a and H2 (H1b), } \beta_0 \text{ is expected to be positive (negative).} \]

Next, I test H3 as to whether audit fees are affected by large goodwill write-offs. I include controls for profitability, asset turnover and size. It is also natural to control for Big-4 audit firm and financial risk (leverage). Following Ramanna and Watts (2011), I include the Herfindahl–Hirschman index (HHI) as a proxy for the number and size of reporting units. Herfindahl–Hirschman index ranges from zero to one: HHI is close to zero if a firm has several equally sized segments, and HHI is close to one if one segment is much larger than other segments. Therefore, a negative association is expected between HHI and audit fees. The regression specification is as follows:

\[ \text{LAF}_{it} = \alpha_0 + \beta_0 WO_{it} + \beta_1 \text{ROA}_{it} + \beta_2 \text{PM}_{it} + \beta_3 \text{Atn}_{it} + \beta_4 \text{Size}_{it} + \beta_5 \text{BTM}_{it} + \beta_6 \text{Big}_{it} + \beta_7 \text{LEV}_{it} + \beta_8 \text{HHI}_{it} + \epsilon_{it} \]  

(3)

\[ LAF = \text{natural logarithm of audit fees; ROA = earnings before goodwill write-offs divided by lagged total assets; PM = profit margin, calculated as earnings before goodwill write-offs divided by sales; Atn = asset turnover, calculated as sales divided by lagged total assets; Big4 = 1 if the firm has a Big 4 auditor, and 0 otherwise; LEV = lagged total debt divided by lagged total assets; and, } HHI = \text{sum of the square of the ratios of segment sales to total firm sales, where all other variables are as previously defined. Consistent with hypothesis H3, the estimated coefficient on } WO \text{ is expected to be positive.} \]

3.3. Sample selection

The data used in the empirical tests are drawn from five sources. Financial statement data are obtained from the Worldscope database, stock return data are obtained from the Datastream daily stock return files, analyst-forecast data are drawn from the I/B/E/S database, and audit fee data are obtained
Table 1
Sample selection criteria, sample period 2002–2006

<table>
<thead>
<tr>
<th>Description</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations of MV&lt;sub&gt;t-1&lt;/sub&gt;, E&lt;sub&gt;t-1&lt;/sub&gt;, CF&lt;sub&gt;t-1&lt;/sub&gt; and R&lt;sub&gt;t-1&lt;/sub&gt;</td>
<td>16,767</td>
</tr>
<tr>
<td>Less: financial institutions (SIC 6000–6999)</td>
<td>1436</td>
</tr>
<tr>
<td>Less: negative book value of equity before the goodwill write-off</td>
<td>15,331</td>
</tr>
<tr>
<td>Less: BTM&lt;sub&gt;t-1&lt;/sub&gt;, R&lt;sub&gt;t-1&lt;/sub&gt; and R&lt;sub&gt;t-1&lt;/sub&gt;-1 unavailable</td>
<td>509</td>
</tr>
<tr>
<td>Less: Beginning-of-period goodwill &lt;$10 million</td>
<td>14,822</td>
</tr>
<tr>
<td>Less: Non-zero but immaterial goodwill write-off</td>
<td>3644</td>
</tr>
<tr>
<td>Full sample</td>
<td>11,178</td>
</tr>
<tr>
<td>Less: Zero goodwill write-off</td>
<td>5897</td>
</tr>
<tr>
<td>Goodwill write-off sample</td>
<td>5281</td>
</tr>
<tr>
<td>Control sample (full sample excluding goodwill write-off firms)</td>
<td>4459</td>
</tr>
</tbody>
</table>

<sup>i</sup> denotes the firm, and <sup>t</sup> denotes the year. MV is the market value of equity, E is earnings, CF is operating cash flows, R represents the returns from 9 months before the end of the fiscal year to 3 months after, and BTM is the book-to-market ratio. An immaterial goodwill write-off is defined as representing < 1 per cent of the beginning-of-year total assets or as <$10 million.

from the Audit Analytics database. 10-K filings are retrieved from the SEC’s Electronic Data Gathering, Analysis, and Retrieval system archives. SEC 10-K filings are used to verify the amounts of the goodwill write-offs as listed by Worldscope and to exclude goodwill write-offs related to the adoption of SFAS 142.\textsuperscript{15}

Table 1 contains information about the selection of the sample. The observations are from the years 2002 through 2006. There are 16,767 firm-year observations that meet the minimum data requirements. I exclude banks and financial institutions (SIC codes between 6000 and 6999) because these firms are regulated (1436 firm-years). In addition, I exclude firms that have negative beginning-of-period book values of equity because these firms are likely to be in financial distress (509 firm-years). Each firm-year observation is required to have non-missing data on the book-to-market ratio and stock returns in years \(t-1\) to \(t+1\). This selection process yields 11,178 firm-year observations. To increase the ability of the empirical tests to capture the economic consequences of goodwill write-offs, I impose two additional restrictions. First, I require that

\textsuperscript{15} Beatty and Weber (2006) examine SFAS 142 adoption decisions, focusing on the trade-off between recording certain current goodwill impairment charges below the line and uncertain future impairment charges included in income from continuing operations. They find that both contracting and market incentives affect firms’ accounting choices regarding the trade-off between the timing and presentation of expense recognition on income statements.
beginning-of-period goodwill be > $10 million. This requirement is natural because there is no point to compare goodwill write-off firms to firms that have no goodwill in the balance sheet. Second, I eliminate firm-years with non-zero but immaterial goodwill write-offs. The initial sample includes 999 firm-year observations from 2002 to 2005 for which the required data are available (2006 data could not be used because of the need to take account of future stock returns). In this sample, there are 80 material goodwill impairment observations, leaving a pool of 4919 potential control observations.\textsuperscript{10} The propensity score model is estimated using these 5199 observations. However, as mentioned in Section 3.1., write-off firms are not used as control firms. Therefore, after removing the write-off firms from the initial sample, the resulting pool of potential matching (control) observations contains 4459 observations. The next section provides the empirical results.

4. Empirical results

4.1. Propensity score estimates

Propensity scores are estimated using the logistic model (1). Table 2 presents the logistic regression estimates. Loss\textsubscript{t} and DBTM\textsubscript{t} are significant predictive variables. These findings are consistent with the view that goodwill is likely to be impaired in cases in which firms report losses and have market values that are less than their book values. As expected, the greater the proportion of goodwill to total assets when impairment is expected (GW\%\textsubscript{t-1} \times DBTM\textsubscript{t}), the higher the probability of an SFAS 142 goodwill write-off. These findings are consistent with those of Hayn and Hughes (2006), who find that certain acquisition characteristics (such as the premium paid and the percentage of the purchase price assigned to goodwill) are predictors of eventual goodwill write-offs. Size\textsubscript{t} is positively related to the probability of a write-off. DR\textsubscript{t} (i.e. an impairment trigger proxy) is significantly positive, indicating that bad news increases the probability of an impairment write-off. The coefficients on DR\textsubscript{t} \times R\textsubscript{t} and DR\textsubscript{t-1} \times R\textsubscript{t-1} are negative, indicating that bad news is correlated with the impairment decision. These results are consistent with conditional conservatism and with the notion that stock prices lead accounting earnings. The inclusion of interacted industry-year fixed effects controls for shocks that are unique to particular industries during a particular year. The model's pseudo-$R^2$ is 20.4 per cent; this figure is somewhat higher than the 12.8 per cent figure reported by Hayn and Hughes (2006).

\textsuperscript{10} A material write-off represents more than 1 per cent of the beginning-of-year total assets or is > $10 million. The $10 million threshold is used to avoid sample selection bias; for very large firms, the 1 per cent threshold would be too restrictive. For example, in 2004, Motorola Inc. incurred a $125 million impairment charge related to goodwill that was, however, < 1 per cent of its beginning-of-period total assets (Jarva, 2009).
Table 2
Logistic regression estimates of goodwill write-offs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Prediction</th>
<th>Coefficient estimate</th>
<th>Chi-square</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td></td>
<td>-5.568</td>
<td>173.547</td>
<td>0.000</td>
</tr>
<tr>
<td>$preE_a$</td>
<td></td>
<td>0.204</td>
<td>1.468</td>
<td>0.233</td>
</tr>
<tr>
<td>Loss$_a$</td>
<td>+</td>
<td>0.990</td>
<td>33.184</td>
<td>0.000</td>
</tr>
<tr>
<td>GW%$_{t-1}$</td>
<td>+</td>
<td>0.578</td>
<td>2.473</td>
<td>0.116</td>
</tr>
<tr>
<td>BTM$_t$</td>
<td>+</td>
<td>0.034</td>
<td>0.152</td>
<td>0.697</td>
</tr>
<tr>
<td>DBTM$_t$</td>
<td>+</td>
<td>0.873</td>
<td>12.057</td>
<td>0.001</td>
</tr>
<tr>
<td>GW%$_{t-1}$ \times DBTM$_t$</td>
<td>+</td>
<td>2.032</td>
<td>9.121</td>
<td>0.003</td>
</tr>
<tr>
<td>Size$_a$</td>
<td>+</td>
<td>0.159</td>
<td>13.399</td>
<td>0.000</td>
</tr>
<tr>
<td>$DR_{t-1}$</td>
<td>+</td>
<td>0.463</td>
<td>4.654</td>
<td>0.031</td>
</tr>
<tr>
<td>$R_{t}$</td>
<td></td>
<td>-0.003</td>
<td>0.009</td>
<td>0.984</td>
</tr>
<tr>
<td>$DR_t \times R_t$</td>
<td>-</td>
<td>-1.839</td>
<td>15.836</td>
<td>0.000</td>
</tr>
<tr>
<td>$DR_{t-1}$</td>
<td>+</td>
<td>-0.018</td>
<td>0.007</td>
<td>0.934</td>
</tr>
<tr>
<td>$R_{t-1}$</td>
<td></td>
<td>-0.307</td>
<td>2.357</td>
<td>0.125</td>
</tr>
<tr>
<td>$DR_{t-1} \times R_{t-1}$</td>
<td>-</td>
<td>-1.328</td>
<td>8.473</td>
<td>0.004</td>
</tr>
<tr>
<td>Industry \times Year</td>
<td>Included</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This table reports the results of the following logistic regression:

\[
\logit(p) = \ln \left( \frac{p}{1-p} \right) = \beta' X
\]

\[
\beta' X = \beta_0 + \beta_1 preE_a + \beta_2 Loss_a + \beta_3 GW%_{t-1} + \beta_4 BTM_t + \beta_5 DBTM_t + \\
+ \beta_6 GW%_{t-1} \times DBTM_t + \beta_7 Size_a + \beta_8 DR_t + \beta_9 R_t + \beta_{10} DR_{t-1} \times R_t + \\
+ \beta_{11} DR_{t-1} + \beta_{12} R_{t-1} + \beta_{13} DR_{t-1} \times R_{t-1} + Industry \times Year + \epsilon_x.
\]

$t$ denotes the firm, and $t$ denotes the year. WO is an indicator variable equal to 1 if a firm reports material goodwill write-off and 0 otherwise. $preE$ represents earnings before goodwill write-off. Loss$_a$ is an indicator variable equal to 1 if preE is negative and 0 otherwise. GW% is the proportion of goodwill to total assets. BTM is the ending book-to-market ratio before the goodwill write-off. DBTM is an indicator variable equal to 1 if BTM is greater than one and 0 otherwise. Size is the natural logarithm of the market value of equity at the end of the fiscal year, $DR$ is an indicator variable equal to 1 if $R$ is negative and 0 otherwise, and $R$ represents the returns from 9 months before the end of the fiscal year to 3 months after. The coefficient estimates for year and industry interaction variables are not reported.

Matching is performed based on the propensity scores discussed earlier. The final sample consists of 280 write-off firm-year observations (the write-off sample) and 280 non-write-off firm-year observations (the matched sample). The control sample includes all potential control observations (including the matched sample).

© 2012 The Author
Accounting and Finance © 2012 AFAANZ
4.2. Descriptive statistics

Table 3 presents the descriptive statistics for the impairment and two control samples. Goodwill write-offs are decidedly material to most firms’ earnings.\textsuperscript{17} The t-tests indicate that the performance differences between goodwill write-off and matched samples are very small, indicating that the matching procedure has balanced these factors very closely. The significant determinants of goodwill impairment variables ($Loss_n$ and $DBTM_n$) are remarkably similar between the two samples. $E_n$, $BTM_n$, $R_{n-1}$, and $Size_n$ are also comparable, indicating the adequacy of the matching process. However, even after the matching, $GW\%_{n-1}$ is significantly higher for the goodwill write-off sample. The results show that the mean $R_n$ and $\Delta r^{PEG}_n$ are near zero for both samples, $i^{PEG}_n$ and $FE_n$ are different only at the 10 per cent level.\textsuperscript{18} Finally, the values of $LAF_{n-1}$ are comparable for the different groups. Despite some small differences, these results and untabulated tests indicate that the matching process has been successful.\textsuperscript{19}

A striking difference can be observed between the goodwill write-off sample and the control sample. Specifically, all variables except $LAF_{n-1}$ differ significantly between the goodwill write-off sample and the control sample. The major differences clearly indicate that write-off firms tend to have performed very poorly in the year in which the goodwill write-off is reported. In addition, these large differences provide a challenge for standard regression analysis.

Panel B of Table 3 reports the descriptive statistics for the dependent variables. The goodwill write-off firms seem to experience substantial returns over the subsequent 12-month period. However, the difference in $R_{n+1}$ between these results and those of the matched group is not significant (mean 55 per cent versus 51 per cent). The estimates of $\Delta r^{PEG}_{n+1}$, $FE_{n-1}$, and $LAF_n$ are also comparable for the two samples. Turning to the differences between the goodwill write-off and the control samples, the results show that all differences are again significant except for audit fees.

\textsuperscript{17}The mean (untabulated median) value of goodwill write-offs is 9.3 per cent (5.9 per cent) of beginning total assets. These amounts correspond to $338 million and $41 million (mean and median respectively). These amounts are also comparable to those presented by Francis et al. (1996), whose sample includes 93 goodwill write-offs during the period 1989–92; the mean (median) write-off is 10.1 per cent (4.4 per cent) of total assets.

\textsuperscript{18}The mean cost of equity is around 15–18 per cent. Although these costs of equity estimates are relatively high, sample firms may be considered risky because they report losses and have poor stock price performance. The slightly higher earnings forecast error finding weakly suggests that analysts may not anticipate write-offs when they are included in street earnings.

\textsuperscript{19}Specifically, I re-estimate the propensity score of the matched sample and compare the pseudo-$R^2$s before and after matching. After matching, the pseudo-$R^2$ should be fairly low if the matching process can be used to balance the distribution of the relevant variables in the two samples (Cafiero and Kopeinig, 2008).
Table 3  
Descriptive statistics for goodwill write-off firm-years versus control firm-years

<table>
<thead>
<tr>
<th>Variable</th>
<th>Goodwill write-off sample</th>
<th>Matched sample</th>
<th>Control sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>N</td>
</tr>
<tr>
<td>preE</td>
<td>280</td>
<td>-0.115</td>
<td>280</td>
</tr>
<tr>
<td>WO%</td>
<td>280</td>
<td>9.318</td>
<td>280</td>
</tr>
<tr>
<td>E</td>
<td>280</td>
<td>-0.297</td>
<td>280</td>
</tr>
<tr>
<td>Loss</td>
<td>280</td>
<td>0.564</td>
<td>280</td>
</tr>
<tr>
<td>BTM</td>
<td>280</td>
<td>1.166</td>
<td>280</td>
</tr>
<tr>
<td>DBTM</td>
<td>280</td>
<td>0.421</td>
<td>280</td>
</tr>
<tr>
<td>GW%</td>
<td>280</td>
<td>0.278</td>
<td>280</td>
</tr>
<tr>
<td>Rn</td>
<td>280</td>
<td>-0.057</td>
<td>280</td>
</tr>
<tr>
<td>Rs</td>
<td>280</td>
<td>-0.002</td>
<td>280</td>
</tr>
<tr>
<td>Size</td>
<td>280</td>
<td>6.234</td>
<td>280</td>
</tr>
<tr>
<td>tP/E</td>
<td>206</td>
<td>0.175</td>
<td>206</td>
</tr>
<tr>
<td>ΔL/R</td>
<td>188</td>
<td>0.017</td>
<td>190</td>
</tr>
<tr>
<td>FE</td>
<td>218</td>
<td>0.061</td>
<td>209</td>
</tr>
<tr>
<td>LAF</td>
<td>258</td>
<td>11.242</td>
<td>267</td>
</tr>
</tbody>
</table>

Panel B: dependent variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rn</td>
<td>280</td>
<td>0.551</td>
</tr>
<tr>
<td>ΔL/R</td>
<td>137</td>
<td>-0.039</td>
</tr>
<tr>
<td>FE</td>
<td>207</td>
<td>0.052</td>
</tr>
<tr>
<td>LAF</td>
<td>258</td>
<td>12.120</td>
</tr>
</tbody>
</table>

In summary, the results in panels A and B of Table 3 indicate that impairment and matched firms do not differ significantly with respect to various performance characteristics. The univariate tests suggest that investors and analysts are able to understand the information conveyed by SFAS 142 goodwill write-offs. Specifically, they are not systematically misled by goodwill write-offs even though these write-offs yield materially lower reported earnings. Moreover, auditors do not appear to charge high fees to clients who write down goodwill. However, outcome variables of interest may be correlated with characteristics that

© 2012 The Author
Accounting and Finance © 2012 AFAANZ
matching may not have balanced. Thus, the next use multivariate analyses to estimate the treatment effect.

4.3. Economic consequences of SFAS 142 goodwill write-offs

Table 4 presents the regression results for the hypotheses. The estimated coefficient on the dummy variable \( WO_i \), \( \beta_0 \), measures the effect of SFAS 142 goodwill write-offs on the variables of interest. Table 4 shows that the coefficient on \( WO_i \) is insignificant in both the propensity score-matched sample and the control sample. This result is inconsistent with H1a and suggests that goodwill write-offs do not cause future abnormal (i.e., higher than normal) returns. The estimates for the control variables reveal that they have the expected signs, except accruals, where the sign is positive, but insignificant. This result is consistent with Sloan (1996), who posited that investors overweight the accrual component of earnings. \( CF_i \) and \( BTM_i \) (\( Size_i \)) are positively (negatively) associated with \( R_{it+1} \). Because accruals and cash flows are negatively correlated, it may be the case that in this sample, the accrual effect is dominated by the cash-flows effect. Notably, the estimated coefficients between two models are very close although the descriptive statistics indicate significant differences between the samples. The adjusted \( R^2 \) is about 18 per cent (12 per cent) for the matched (control) sample.

Table 4
Future returns analysis: control and propensity score-matched samples

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Prediction</th>
<th>Matched sample: coefficient estimate (t-statistic)</th>
<th>Control sample: coefficient estimate (t-statistic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>+</td>
<td>0.657* (1.95)</td>
<td>0.318*** (2.88)</td>
</tr>
<tr>
<td>WO_i</td>
<td>+</td>
<td>-0.046 (-0.50)</td>
<td>0.072 (1.07)</td>
</tr>
<tr>
<td>preACC_i</td>
<td>-</td>
<td>0.132 (1.25)</td>
<td>0.008 (0.10)</td>
</tr>
<tr>
<td>CF_i</td>
<td>+</td>
<td>0.337** (2.57)</td>
<td>0.161 (1.33)</td>
</tr>
<tr>
<td>Size_i</td>
<td>-</td>
<td>-0.082** (-2.55)</td>
<td>-0.035*** (-3.40)</td>
</tr>
<tr>
<td>BTM_i</td>
<td>+</td>
<td>0.383** (2.58)</td>
<td>0.316*** (3.97)</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>550</td>
<td>4739</td>
</tr>
<tr>
<td>N where WO = 1</td>
<td></td>
<td>280</td>
<td>280</td>
</tr>
<tr>
<td>Adj. ( R^2 ) (%)</td>
<td></td>
<td>17.83</td>
<td>12.23</td>
</tr>
</tbody>
</table>

This table presents the results of the following model:

\[
R_{i,t+1} = \alpha_0 + \beta_0 WO_i + \beta_1 \text{preACC}_i + \beta_2 \text{CF}_i + \beta_3 \text{Size}_i + \beta_4 \text{BTM}_i + \epsilon_{i,t+1}.
\]

\( i \) denotes the firm, and \( t \) denotes the year. \( R \) is the return from 9 months before fiscal year end to 3 months after fiscal year end, \( WO \) is an indicator variable equal to 1 if a firm reports material goodwill write-off and 0 otherwise, \( \text{preACC} \) is accruals before goodwill write-off scaled by market value of equity 3 months after the fiscal year \( t-1 \), \( CF \) is operating cash flows scaled by market value of equity 3 months after the fiscal year \( t-1 \), \( Size \) is the natural logarithm of the market value of equity at fiscal year end, and \( BTM \) is the ending book-to-market ratio before the goodwill write-off. White heteroscedasticity-consistent \( t \)-statistics are in parentheses. ***, ** and * indicate statistical significance at the 1 per cent, 5 per cent and 10 per cent levels (two-tailed).

© 2012 The Author
Accounting and Finance © 2012 AFAANZ
Table 5 presents the results for H1b. If the previous conclusion is correct, one would expect to find no association between future change in cost of equity and goodwill write-offs. Indeed, the results show that the coefficients on $WO_{it}$ are again insignificant in both the propensity score–matched sample and the control sample. As a result, I can find no evidence of a link between goodwill write-offs and changes in the cost of equity. The expected signs for the control variables are the opposite of the previous one. The accrual effect is again insignificant. Somewhat surprisingly, the coefficient on $CF_{it}$ is positive. The combined evidence suggests that cash flows contain information about shocks to expected cash flows and expected returns. $Size_{it}$ has a near-zero effect on $\Delta r_{it}^{PEG}$. I find a negative and marginally significant $BTM_{it}$ coefficient of $-0.039$ and a negative and significant $BTM_{it}$ coefficient of $-0.029$ in the matched and control samples, respectively. The adjusted $R^2$ is higher in the matched sample (28 per cent versus 12 per cent).

Next, I examine H3, that is, the association between SFAS 142 goodwill write-offs and analyst-forecast accuracy with respect to future earnings. The findings in Table 6 indicate that earnings forecast accuracy is not lower for write-off firms. Specifically, the coefficient on $WO_{it}$ is once again insignificant in both the propensity score–matched sample and the control sample. This finding is consistent with the principle of analyst-forecast rationality. Note also that intercepts in

Table 5
Future change in cost of equity analysis: control and propensity score–matched samples

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Prediction</th>
<th>Matched sample: coefficient estimate (t-statistic)</th>
<th>Control sample: coefficient estimate (t-statistic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>–</td>
<td>$-0.019\ ( -0.38)$</td>
<td>$-0.004\ ( -0.23)$</td>
</tr>
<tr>
<td>$WO_{it}$</td>
<td>–</td>
<td>$0.002\ (0.15)$</td>
<td>$-0.005\ (-0.77)$</td>
</tr>
<tr>
<td>$preACC_{it}$</td>
<td>+</td>
<td>$0.043\ (1.58)$</td>
<td>$0.052^*\ (1.79)$</td>
</tr>
<tr>
<td>$CF_{it}$</td>
<td>–</td>
<td>$0.106^{**}\ (3.17)$</td>
<td>$0.084^{**}\ (3.03)$</td>
</tr>
<tr>
<td>$Size_{it}$</td>
<td>+</td>
<td>$0.003\ (0.62)$</td>
<td>$0.001\ (0.39)$</td>
</tr>
<tr>
<td>$BTM_{it}$</td>
<td>–</td>
<td>$-0.039^*\ (-1.72)$</td>
<td>$-0.029^{**}\ (-2.19)$</td>
</tr>
</tbody>
</table>

This table presents the results of the following model:

$$\Delta r_{it}^{PEG} = \gamma_0 + \gamma_0 WO_{it} + \gamma_1 preACC_{it} + \gamma_2 CF_{it} + \gamma_3 Size_{it} + \gamma_4 BTM_{it} + \epsilon_{it}$$

$i$ denotes the firm, and $t$ denotes the year. $\Delta r_{it}^{PEG}$ is change in cost of equity, $WO$ is an indicator variable equal to 1 if a firm reports material goodwill write-off and 0 otherwise, $preACC$ is accruals before goodwill write-off scaled by market value of equity 3 months after the fiscal year $t-1$, $CF$ is operating cash flows scaled by market value of equity 3 months after the fiscal year $t-1$, $Size$ is the natural logarithm of the market value of equity at fiscal year end, and $BTM$ is the ending book-to-market ratio before the goodwill write-off. White heteroscedasticity-consistent $t$-statistics are in parentheses. ***, ** and * indicate statistical significance at the 1 per cent, 5 per cent and 10 per cent levels (two-tailed). PEG, positive earnings growth.

© 2012 The Author
Accounting and Finance © 2012 AFAANZ
Table 6
Future analyst-forecast accuracy: control and propensity score-matched samples

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Prediction</th>
<th>Matched sample: coefficient estimate (t-statistic)</th>
<th>Control sample: coefficient estimate (t-statistic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>+</td>
<td>0.131*** (3.37)</td>
<td>0.039*** (6.23)</td>
</tr>
<tr>
<td>$WO_{it}$</td>
<td>+</td>
<td>-0.027 (-1.60)</td>
<td>0.004 (0.45)</td>
</tr>
<tr>
<td>$preACC_{it}$</td>
<td>+</td>
<td>-0.032 (-1.17)</td>
<td>-0.102*** (-3.73)</td>
</tr>
<tr>
<td>$CF_{it}$</td>
<td>-</td>
<td>-0.204*** (-2.36)</td>
<td>-0.131*** (-3.14)</td>
</tr>
<tr>
<td>$Size_{it}$</td>
<td>-</td>
<td>-0.017*** (-3.24)</td>
<td>-0.004*** (-5.21)</td>
</tr>
<tr>
<td>$BTM_{it}$</td>
<td>+</td>
<td>0.035*** (3.42)</td>
<td>0.025*** (3.83)</td>
</tr>
<tr>
<td>$N$</td>
<td></td>
<td>415</td>
<td>4077</td>
</tr>
<tr>
<td>$N$ where $WO = 1$</td>
<td></td>
<td>207</td>
<td>207</td>
</tr>
<tr>
<td>Adj. $R^2$ (%)</td>
<td></td>
<td>20.56</td>
<td>12.08</td>
</tr>
</tbody>
</table>

This table presents the results of the following model:

$$FE_{it+1} = a_0 + \beta_0 WO_{it} + \beta_{preACC_{it}} + \beta_{CF_{it}} + \beta_{Size_{it}} + \beta_{BTM_{it}} + \varepsilon_{it+1}.$$  

$i$ denotes the firm, and $t$ denotes the year. $FE$ is analyst earnings forecast accuracy, $WO$ is an indicator variable equal to 1 if a firm reports material goodwill write-off and 0 otherwise, $preACC$ is accruals before goodwill write-off scaled by market value of equity 3 months after the fiscal year $t-1$, $CF$ is operating cash flows scaled by market value of equity 3 months after the fiscal year $t-1$, $Size$ is the natural logarithm of the market value of equity at fiscal year end, and $BTM$ is the ending book-to-market ratio before the goodwill write-off. While heteroscedasticity-consistent $t$-statistics are in parentheses. ***, ** and * indicate statistical significance at the 1 per cent, 5 per cent and 10 per cent levels (two-tailed).

both samples are significantly positive, but this is as expected because the average absolute forecast error is a function of the standard deviation of the (signed) forecast errors. Coefficient estimates on the control variables are also of interest. I find that $preACC_{it}$, $CF_{it}$, and $Size_{it}$ are negatively associated with $FE_{it+1}$ (although $preACC_{it}$ is insignificant in the matched sample). The positive association between $BTM_{it}$ and $FE_{it+1}$ suggests that analysts have difficulties assessing the future earnings performance of high book-to-market firms.

Finally, I examine whether auditors charge a premium for firms that write off goodwill. The estimated coefficient on $WO_{it}$ is positive and significant in both samples. That audit fees are larger for write-off firms is consistent with hypothesis H3 and with the view that auditors charge higher fees to compensate for additional effort. This is expected because impairment testing in SFAS 142 occurs at the reporting unit level. Auditors do not have a comparative advantage in valuing divisions of firms, so they require compensation for their efforts. Note that auditors are in a position to exert major influence upon the write-off decision, and when setting prices, the auditor takes into account the likelihood of the write-off. This argument is further supported by the sensitivity tests reported below.

The results for the control variables are generally consistent with the existing evidence. I find that $PM_{it}$, $Size_{it}$ and $Lev_{it}$ are positively associated with $LAF_{it}$.
The coefficient on $BTM_{it}$ is negative, indicating that audit fees are smaller for low-growth firms. In the control sample, the negative sign on the $HHI_{it}$ coefficient indicates that audit fees are larger for firms that have more (and more equally sized) reporting units. The insignificant coefficient on $Big4_{it}$ is somewhat surprising and does not provide support for the Big 4 premium.

Taken together, the evidence in Tables 4–7 suggests that SFAS 142 goodwill write-offs do not per se entail significant economic consequences in terms of the variables of interest except in the case of audit fees, which do tend to be higher. Investors and analysts do not appear to fixate on earnings, at least not with regard to SFAS 142 goodwill write-offs. Thus, market participants appear to be able to adjust for temporary distortions in earnings. However, it appears that auditors charge goodwill write-off firms higher fees.

Table 7
Current audit fees: control and propensity score-matched samples

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Prediction</th>
<th>Matched sample: coefficient estimate (t-statistic)</th>
<th>Control sample: coefficient estimate (t-statistic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td></td>
<td>5.771*** (6.80)</td>
<td>4.650*** (13.91)</td>
</tr>
<tr>
<td>$WO_{it}$</td>
<td>+</td>
<td>0.650** (2.51)</td>
<td>0.540*** (2.83)</td>
</tr>
<tr>
<td>$ROA_{it}$</td>
<td>–</td>
<td>–1.131 (–0.87)</td>
<td>–3.809*** (–6.46)</td>
</tr>
<tr>
<td>$PM_{it}$</td>
<td>–</td>
<td>0.068*** (4.46)</td>
<td>0.047** (2.17)</td>
</tr>
<tr>
<td>$Attn_{it}$</td>
<td>+</td>
<td>0.068 (0.45)</td>
<td>0.071 (1.32)</td>
</tr>
<tr>
<td>$Size_{it}$</td>
<td>+</td>
<td>1.044*** (14.36)</td>
<td>1.142*** (39.64)</td>
</tr>
<tr>
<td>$BTM_{it}$</td>
<td>–</td>
<td>–0.037*** (–0.37)</td>
<td>0.292*** (3.91)</td>
</tr>
<tr>
<td>$Big4_{it}$</td>
<td>+</td>
<td>–0.946*** (–1.98)</td>
<td>–0.220 (–1.09)</td>
</tr>
<tr>
<td>$Lev_{it}$</td>
<td>+</td>
<td>2.546*** (3.64)</td>
<td>1.876*** (7.26)</td>
</tr>
<tr>
<td>$HHI_{it}$</td>
<td>–</td>
<td>–0.765 (–1.58)</td>
<td>–1.453*** (–3.36)</td>
</tr>
<tr>
<td>$N$</td>
<td>-</td>
<td>523</td>
<td>4540</td>
</tr>
<tr>
<td>$N$ where $WO =1$</td>
<td></td>
<td>258</td>
<td>258</td>
</tr>
<tr>
<td>Adj. $R^2$ (%)</td>
<td></td>
<td>39.58</td>
<td>30.93</td>
</tr>
</tbody>
</table>

This table presents the results of the following model:

$$LAF_{it} = a_0 + b_0 WO_{it} + b_1 ROA_{it} + b_2 PM_{it} + b_3 Attn_{it} + b_4 Size_{it} + b_5 BTM_{it} + b_6 Big4_{it} + b_7 Lev_{it} + b_8 HHI_{it} + \epsilon_i.$$  

$i$ denotes the firm, and $t$ denotes the year. $LAF$ is the natural logarithm of audit fees, $WO$ is an indicator variable equal to 1 if a firm reports material goodwill write-off and 0 otherwise. $ROA$ is earnings before goodwill write-offs divided by lagged total assets, $PM$ is profit margin, calculated as earnings before goodwill write-offs divided by sales, $Attn$ is asset turnover, calculated as sales divided by lagged total assets, $PM$ is profit margin, calculated as earnings before goodwill write-offs divided by sales, $Attn$ is asset turnover, calculated as sales divided by lagged total assets, $PM$ is profit margin, calculated as earnings before goodwill write-offs divided by sales, $Attn$ is asset turnover, calculated as sales divided by lagged total assets, $BTM$ is the ending book-to-market ratio before the goodwill write-off, $Big4$ is an indicator variable equal to 1 if the firm has a Big 4 auditor and 0 otherwise, $Lev$ is lagged total debt divided by lagged total assets, $HHI$ is the Herfindahl-Hirschman index, and it is calculated as the sum of the square of the ratios of segment sales to total firm sales. White heteroscedasticity-consistent $t$-statistics are in parentheses. ***, ** and * indicate statistical significance at the 1 per cent, 5 per cent and 10 per cent levels (two-tailed).

© 2012 The Author
Accounting and Finance © 2012 AFAANZ
4.4. Sensitivity analyses

4.4.1. Outliers

All results reported in this section are available upon request. The variables used in this study are subject to measurement error, so it advisable to consider the possibility of outliers in the data. To alleviate these problems, I conduct two robustness tests. First, all variables are winsorized at the upper and lower one (5 per cent) bound of their distribution. Second, I delete observations that have studentized residuals with an absolute value > 3 and rerun the regressions (Jarva, 2009). The basic results remain unchanged; all the goodwill write-off dummy variables except that for audit fees are statistically insignificant.

4.4.2. Analyst-forecast accuracy

Analyst-forecast accuracy tests are based on unsigned forecast error measures. Using signed forecast error measures does not change the inferences made. Interestingly, the mean forecast errors are consistently negative (indicating optimism) for both sets of firms. However, analysts’ future earnings forecast errors are not greater for write-off firms. It is also possible that the I/B/E/S data do not reflect various expenses incurred in the GAAP. Therefore, I examine analysts’ future sales forecasts and find that the results remain unchanged.

4.4.3. Non-audit fees

I find that SFAS 142 goodwill write-off firms pay higher audit fees. Although I control for several determinants in the audit fee regression, it is possible that the results are driven by correlated omitted variables. I replace audit fees with non-audit fees and find that write-off firms do not pay higher non-audit fees than do non-write-off firms. This finding mitigates the concern that the results are affected by a lack of control.

4.4.4. Propensity score model

It is advisable to examine the sensitivity of the results to small changes in the propensity score specification. I find that all results that are using alternative specifications are similar to the tabulated results. In addition, the results are robust to alternative matching approaches.

4.4.5. Manipulation versus impairment

Thus far, this paper has examined the average economic effects of SFAS 142 goodwill write-offs. It is possible that write-off firms are fundamentally different from each other in some respects. Broadly speaking, the sample includes two
sets of firms. The first set of firms comprises those that took write-offs and had a high probability of doing so matched with those that did not take a write-off but had a high probability of doing so (the impairment sample). The second set of firms includes those that had a low probability of taking a write-off but took one anyway matched with those that exhibited a low probability of taking a write-off and did not do so (the manipulation sample). It may be that my failure to find significant results is a result of the offsetting effects of the two sets of firms.

An untabulated analysis reveals that the distribution of propensity scores is markedly skewed to the left. To investigate whether the results are different for the two sets of firms, the full sample is split in two. The impairment (manipulation) sample consists of firms with a probability higher (lower) than 0.20 of making an impairment write-off decision (178 and 382 firm-years, respectively). Then, the model (2) is estimated separately for the two samples. The results remain essentially unchanged, but there is one exception. It appears that only write-off firms with a high probability of impairment pay higher audit fees. The audit fees of low-probability write-off firms are not statistically different from those of low-probability non-write-off firms. These results confirm the conclusion that auditors charge higher fees when they expect to expend extra effort. It appears that auditors charge higher fees for firms that have overvalued goodwill and call for goodwill write-offs during the fiscal year. To the best of my knowledge, this is the first study to provide such evidence.

4.4.6. Alternative explanations

I find that SFAS 142 goodwill write-offs per se do not influence the future economic performance of the write-off firms; there is only one exception (audit fees). However, this study has some limitations. The empirical results are generally consistent with at least two alternative hypotheses. The first is that SFAS 142 goodwill write-offs may largely be noise, with no significant effect on firms’ economic fundamentals. For example, managers may engage in ‘big bath’ behaviour and write down goodwill when earnings are already below expectations. Secondly, even if these write-offs are informative, empirical tests may lack the power to identify any underlying effect. All my tests are joint tests of whether there is an effect and whether the research method is appropriate.

5. Conclusions

This paper extends the existing research by examining the economic consequences of SFAS 142 goodwill write-offs. One criticism of SFAS 142 is that management’s intentional or unintentional errors may increase in tandem with the movement towards fair-value accounting. This paper addresses the question of how SFAS 142 goodwill write-off firms would have performed had they foregone the write-offs. Thus, I use SFAS 142 goodwill write-offs to examine
the economic determinants and consequences of a particular accounting choice. The propensity score matching technique allows me to overcome selection bias and to control for the endogeneity of the decision to write off goodwill. Although this approach is not novel, it is not generally used in accounting research.

I examine a sample of 280 SFAS 142 goodwill write-offs taken over the period 2002–2005. The empirical evidence indicates that firms reporting SFAS 142 goodwill write-offs report losses, have book values less than their market values and experience high equity capital costs. The evidence also indicates that goodwill write-offs may have an enormous impact on both accounting earnings and the book value of assets. Overall, the results suggest that firms writing off goodwill have performed very poorly and are risky in the year when the goodwill write-off is reported. However, the results also show that for a high proportion of sample firms, deteriorating economic performance does not significantly predict goodwill write-offs. This finding suggests that managers use the discretion afforded by SFAS 142 to avoid timely write-offs.

I also investigate a wide range of outcome variables to assess whether SFAS 142 goodwill write-offs have significant economic consequences. The purpose of this analysis is to examine whether investors and analysts are able to accurately incorporate the information contained in write-offs into prices and earnings forecasts. After controlling for the endogeneity of write-off choice, I find that write-off firms do not earn higher future (i.e. 1-year-ahead) stock returns than do control firms. I also find that write-off firms do not experience more negative changes in the future cost of equity; these results corroborate my earlier findings. Furthermore, I show that the analysts’ future earnings forecast accuracy is not poorer for write-off firms (although I do document the well-known optimistic bias in analysts’ forecasts). Thus, I fail to find evidence that investors or analysts fixate on earnings, at least with regard to SFAS 142 goodwill write-offs. Finally, write-off firms pay higher audit fees, which suggests that auditors charge higher fees to compensate for the extra effort that they must expend. Taken together, the results are consistent with the principles of market efficiency, analyst-forecast rationality and efficient audit pricing.

This paper contributes to the debate on fair values in accounting by examining the economic consequences of goodwill write-offs. However, the results reported here should be interpreted with caution. Although the results suggest that SFAS 142 goodwill write-offs have not yielded adverse capital market consequences, I cannot claim that stock valuations would have been the same if goodwill had instead been amortized over some minimum period. In addition, it may be costly for market participants to evaluate the performance of firms that do not impair their goodwill. Moreover, the results are not intended to suggest that SFAS 142 is not beneficial or that goodwill write-offs are trivial and irrelevant. My investigation provides an introduction to the economic consequences of SFAS 142. Future research could attempt to examine the underlying economic costs and benefits of impairment avoidance.
References


© 2012 The Author
Accounting and Finance © 2012 AFAANZ