



# The Amount and Timing of Goodwill Write-Offs and Revaluations: Evidence from U.S. and U.K. Firms

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**Abstract.** This paper investigates criticisms that U.S. GAAP had given firms too much discretion in determining the amount and timing of goodwill write-offs. Using 1,576 U.S. and 563 U.K. acquisitions, we find little evidence that U.S. firms managed the amount of goodwill write-off or that U.K. firms managed the amount of revaluations (write-ups of intangible assets). However, our results are consistent with U.S. firms delaying goodwill write-offs and U.K. firms timing revaluations strategically to avoid shareholder approval linked to certain financial ratios.

**Key words:** goodwill, impairments, intangible assets, managerial incentives

**JEL Classification:** G14, G34, G38, M14

## 1. Introduction

Statement of Financial Accounting Standards (SFAS) No. 142, *Goodwill and Other Intangible Assets*, eliminates the amortization of goodwill acquired in business combinations, while providing a two-step test that requires the impairment of goodwill when the carrying amount of a reporting unit exceeds its fair value.<sup>1</sup> These changes are intended to address two criticisms of the pre-SFAS No. 142 accounting rules—the *measurement* and *timing* of goodwill write-offs. We investigate both of these criticisms in this paper.

The first criticism of pre-SFAS No. 142 accounting rules is that the rules provided too much flexibility in measurement of an impairment of goodwill, giving firms too much discretion as to the amount of the write-off. SFAS No. 142 limits discretion by requiring a fair value approach to goodwill impairment using either market values or discounted cash flows. To examine this change, we compare pre-SFAS No. 142 write-offs to write-offs predicted by market and earnings-based approaches suggested in SFAS No. 142.

A second criticism of pre-SFAS No. 142 impairment testing rules is that an absence of a specific impairment “trigger” gave firms too much discretion in timing the write-off. Previous accounting rules did not require regular testing and focused the test at the firm-wide level. The ability to defer an impairment charge likely diminishes under SFAS No. 142 because it requires annual testing, including the adoption year, and because firms must execute the for each reporting unit (i.e., one level below the segment level) instead of for the

firm as a whole. We use a “transition write-off” sample of firms to examine if the change in rules results in more timely recognition of impairment charges.

In a parallel approach, we perform similar analyses on a sample of U.K. firms that, after initially writing off goodwill on the acquisition date, subsequently capitalized “internally generated” intangible assets related to those acquisitions and embedded in the original goodwill. Collectively, our tests provide evidence on whether U.S. and U.K. goodwill recognition converge, despite different home country GAAP.

We identified two samples of firms on which we conducted our tests. First, we identified 94 firms from the United States that announced impairments of purchased goodwill between 1990 and 2001. Second, we identified 77 firms from the United Kingdom that announced intangible asset revaluations during the same time period. In comparing the amount of actual U.S. write-offs (U.K. revaluations) to those predicted by market and earnings-based valuation models, we find little support for the claim that firms inflated write-offs (revaluations) under pre SFAS No. 142 accounting rules. In particular, there were no significant differences between actual and predicted amounts for either U.S. write-offs or U.K. revaluations.

Regarding the timing issue, we find that not all sample firms wrote off (revalued) goodwill predicted by the models. However, SFAS No. 142 apparently has successfully prompted many of these write-offs, since a disproportionately high percentage of firms with weak performance have recognized impairments upon adopting SFAS No. 142. This standard may have triggered recognition of impairments by reducing the flexibility previously afforded by GAAP. In addition, transition period write-offs significantly exceeded predicted write-offs, suggesting that firms might be using the transition period to minimize future write-offs. We also find that the decision to revalue internally generated intangibles apparently was a response to London Stock Exchange rules that required managers obtain shareholder approval for future acquisitions. The revaluations allowed managers to avoid asking for that approval. This suggests a potential need for U.K. rules that reduce firm discretion.

The remainder of the paper is organized as follows. Section 2 describes the current accounting for goodwill. Section 3 motivates the hypotheses to be tested and describes the empirical development of the market-based goodwill measures. Section 4 describes the market and earnings based estimates used in the tests. Section 5 describes the sample. Sections 6 and 7 provide the results of our tests and a brief summary and conclusions.

## **2. The accounting for goodwill, impairments, and revaluations**

### *2.1. The accounting for goodwill in the United States*

Goodwill in the United States has always been subject to a test for impairment. Prior to SFAS No. 142, two different standards addressed goodwill impairment testing. Initially, APB Opinion No. 17, *Intangible Assets*, required that firms test for goodwill impairment at the “enterprise level.” Therefore, if the acquired business was integrated fully into the acquirer’s operations, evaluation of the goodwill was appropriate only at the level of the company as a whole. However, APB No. 17 did not specify how to measure the existence or extent of enterprise level goodwill impairment. Three methodologies evolved in practice: a market value method, undiscounted cash flows methods, and discounted cash flows methods.<sup>2</sup>

After issuing SFAS No. 121, *Accounting for the Impairment of Long-Lived Assets*, firms must assess the recoverability of goodwill at two levels. In testing for goodwill impairment, firms “pushed down” some of the enterprise level goodwill and included it in the carrying amount of the assets for the impairment test. The firm avoided goodwill impairment if, in the first stage of the test, the summed expected undiscounted cash flows generated by the acquired assets exceeded the carrying value of those assets (including goodwill). The goodwill remaining after the application of this impairment test continued to be subject to assessment of recoverability at the enterprise level. SFAS No. 121 did not address specifically the timing of the impairment test.

SFAS No. 142 differs from previous GAAP in two important respects. First, SFAS No. 142 requires goodwill to be tested for impairment at least annually, and the impairment test must be applied at the reporting unit level.<sup>3</sup> This rule eliminates enterprise level goodwill and requires firms to allocate goodwill to one or more reporting units as of the impairment testing date. Second, the new rule requires firms to measure the impairment by using either a fair value or discounted cash flow approach.

## 2.2. *Accounting for goodwill and revaluations in the United Kingdom*

Until the end of 1998, the recommended alternative for U.K. firms under Statement of Standard Accounting Practice (SSAP) No. 22, *Accounting for Goodwill*, was to write off purchased goodwill at the time of acquisition. Firms could subsequently “revalue” various assets periodically, recognizing the surplus in a revaluation reserve account in the shareholders’ equity. While goodwill may not be written up to current fair market value, firms could identify and capitalize separately identifiable intangible assets previously written off as part of goodwill. The end result is that specific identifiable intangible assets that were part of goodwill written off may subsequently be capitalized (brand value is the most common revalued asset in our study).

## 3. Hypotheses development

### 3.1. *Estimating the magnitudes of write-offs and revaluations*

Francis, Hanna and Vincent (1996) report that incentives to manipulate earnings play a substantial role in explaining discretionary write-offs such as goodwill. They suggest that the absence of GAAP guidelines addressing independent measures of economic value makes it difficult to evaluate the magnitude of the write-off. This concern arose from the fact that the guidance on measuring impairment in pre-SFAS No. 142 rules was limited to a U.S. Securities and Exchange Commission (SEC) interpretation that final assessment of recoverability should occur at the enterprise level. The SEC staff also stated “a discounted cash flows approach is preferable to an undiscounted cash flows approach and a market value approach is preferable to a discounted cash flows approach, assuming that market value is reliably determinable.”<sup>4</sup>

In contrast, U.K. firms are adding intangibles back to their books as acquired brand assets after previously writing off acquired goodwill. Kallapur and Kwan (2000) suggest

that these discretionary valuations of acquired brand assets in the U.K. are associated with stock prices and with future earnings. Barth and Clinch (1998) find a similar result in Australia, showing that managers' revaluations of intangible assets are as value-relevant as revaluations of tangible assets. However, neither study compares the revaluation against predicted amounts, nor do they assess managerial incentives for the revaluations.

We examine these issues by comparing market and earnings-based estimates of goodwill write-offs and revaluations to actual goodwill impairments and revaluations in the years following the business combination, conditional on firms having decided to make an adjustment. For these groups and the control firms from each country (those with acquisitions but no write-offs or revaluations), we disaggregate goodwill into two components using a model proposed by Bradley, Desai and Kim (1988). CORE is the sum of the excess value of a firm when it is not "in play" as an acquisition target over the fair market value of its net assets and the fair market value of the synergies from combining the acquirer's and target's operations. RESID is total goodwill minus CORE.

Henning, Lewis and Shaw (2000) find that the market treats RESID as an expense at the time of the acquisition and that this decomposition is consistent with the initial and continuing market valuation of the combined firm. Therefore, we expect goodwill write-offs to consist of the RESID component and, to the extent that the combined firm has difficulty realizing the expected benefits from the acquisition, any loss in the value of CORE since the acquisition would also be part of the impairment charge. This implies the following hypothesis:

H<sub>1A</sub>: The goodwill impaired by U.S. firms is not significantly different from the amount initially designated as RESID adjusted by changes in the value of CORE.

Conversely, for the U.K. firms, the benefits of a successful acquisition map into an appreciated value of CORE. Therefore, we expect any revaluation of underlying intangibles to include not only the initial core estimate, but also to include any postacquisition growth in the CORE goodwill component (i.e., a repricing of CORE). We test the following hypotheses:

H<sub>1B</sub>: The revalued asset by U.K. firms is not significantly different from the amount of repriced CORE.

### 3.2. *Timing of impairments in the U.S.*

The SEC staff has observed variations in practice with respect to when a company recognizes an impairment of enterprise goodwill and the proportion impaired, depending on the methods applied and the assumptions employed.<sup>5</sup> This is consistent with the conclusion in Francis, Hanna and Vincent (1996) that the absence of GAAP guidelines allowed discretion with respect to the timing of goodwill impairments (and whether they were recognized at all).

If the adoption of SFAS No. 142 addressed the issue of discretion, there should be a significant increase in the number of recognized impairments in the transition year. The transition year is the fiscal year beginning after December 15, 2001. Companies have six months from the data of initial adoption to identify impairments, and twelve months

to recognize them. This transition provides us with the opportunity to examine whether “holdouts” in our sample of firms recognized impairment upon its adoption.

There are at least two reasons why firms that previously avoided the recognition of goodwill impairments may have to recognize impairment under the new rule. First, SFAS No. 121 requires an impairment test be conducted at the time of adoption. Application of previous goodwill impairment tests was not required regularly, and it was not clear whether goodwill could be evaluated for impairment by itself under SFAS No. 121. Second, SFAS No. 142 narrowed the unit of analysis considerably. Many firms may have avoided goodwill impairments under APB 17 by masking the goodwill impairment relating to a part of the firm with internally generated goodwill from other parts of the firm. In addition, SFAS No. 121 left the unit of analysis to management discretion. SFAS No. 142 requires that all goodwill be pushed down to a reporting unit. If goodwill is impaired, a reporting unit is less likely to also have internally generated goodwill in amounts that are sufficient to mask the impairment. As a result, a narrower unit of analysis is likely to reduce managerial discretion, resulting in more impairment. We test the following hypothesis:

$H_{2A}$ : Firms with significantly negative post-acquisition performance that did not recognize an impairment pre-SFAS No. 142 (i.e., the transition write-off sample) are more likely to recognize impairments in transition than other firms with goodwill.

Since firms do not report performance by reporting units, we use enterprise level performance as a proxy.<sup>6</sup> This may be a noisy measure since firms that perform poorly at the enterprise level may be able to avoid impairment if a reporting unit performs particularly well. Conversely, a firm may perform well at the enterprise level, but have a reporting unit that impairs goodwill because of poor performance.

A final issue we address is why these firms deferred taking impairment charges. In other words, did they differ in some way from the firms that took the impairments at a time predicted by the market-based models? We examine this possibility by comparing firm and transaction characteristics of firms initially recognizing impairments, firms that recognized impairments under the transition rules and the remaining firms that still have not announced impairments. The primary concern is that transition period firms would announce large goodwill impairments based on a belief that, as “below-the-line” items, the market would view such impairments as relating to a past problem and having no impact on current firm value.<sup>7</sup>

### 3.3. *Incentives to revalue*

Muller (1999) suggests that U.K. firms’ decisions to capitalize brand values were influenced by the impact that the immediate write-off of goodwill to equity had on the London Stock Exchange (LSE) shareholder approval requirements for future acquisitions and disposals. He finds that firms subject to the greatest contracting incentives capitalize separately identifiable intangible assets at the time of acquisition instead of writing them off against reserves as part of goodwill.<sup>8</sup>

Muller (1999) summarizes the percentage ratios that determine whether shareholder approval is required for acquisitions and dispositions. Acquisitions and dispositions where any percentage ratio is greater than 25 percent require shareholder approval. The current listing rules of the LSE require firms to calculate the following five ratios using amounts found in the latest published audited consolidated accounts:

- The assets of the business being acquire divided by the assets of the listed firm.
- The profits (before taxes and extraordinary items) of the business being acquired divided by the profits of the listed firm.
- The consideration being paid divided by the net assets of the listed firm.
- The consideration paid divided by the aggregate market value.
- The gross capital of the business being acquired divided by the gross capital of the listed firm.

We examine whether managers responded to these contracting incentives in deciding upon post-acquisition revaluations. Specifically, we examine whether managers revalue intangible assets previously written off as part of goodwill in order to circumvent shareholder approval for future acquisitions. We test the following hypothesis:

$H_{2B}$ : Firms with significantly positive post-acquisition performance are more likely to revalue assets as they approach the 25 percent threshold for any of the percentage ratios.

We focus on those with significantly positive performance since it is those firms that are most likely to be able to justify revaluation of internally generated intangible assets.

#### 4. Market and earnings-based goodwill measures

In this section, we describe market-based and earnings-based models that may be useful in predicting the extent of goodwill impairments and revaluations.

##### 4.1. *Decomposition of purchased goodwill*

A decomposition of purchased goodwill into components is described in Johnson and Petrone (1998) and in SFAS No. 141 (paragraphs B102-B106). The first component of goodwill relates to the target's ability to earn, on a stand-alone basis, a higher return on a collection of net assets than is represented by the sum of the values of the separable net assets. This value, which is based on the market value of the target when it is not "in play" as an acquisition target, is the first component of core goodwill (denoted CORE).

The remaining components of goodwill are transaction specific. These components are the fair value of synergies from combining the acquirer's and target's operations and net assets (Component 2), payments resulting from overvaluation of the consideration used (Component 3), and overpayment by the acquirer in the course of bidding (Component 4). Component 2 is conceptually the remaining component of CORE. Components 3 and 4

are classified as residualbased (RESID) goodwill, and are discussed in greater detail in the following section.

#### 4.2. Empirical operationalization of market-based approach

Bradley, Desai and Kim (1988) suggest that the fair value of synergies (Component 2) can be estimated from the excess of the combined increase in value of the two entities at the acquisition announcement.<sup>9</sup> They estimate the fair value of the synergies by calculating the cumulated net change in market value of both the target and acquiring firm, using an 11-day window centered on the initial and all subsequent announcements, if any, during the acquisition period. Combining this asset with going-concern goodwill (the market value of the target six trading days prior to the first takeover announcement minus the fair value of the net assets acquired as disclosed in the annual report) results in an estimate of CORE.<sup>10</sup> This calculation eliminates Components 3 and 4, overpayment and overvaluation, from the initial valuation of purchased goodwill, consistent with FASB's concept of core goodwill. Specifically, RESID is total goodwill from the transaction less CORE. In most instances, RESID results from an increase in the target's stock price that is more than offset by a decrease in the acquirer's stock price. One interpretation is that RESID captures a transfer of wealth from acquirer shareholders to target shareholders. Henning, Lewis and Shaw (2000) provide evidence that this decomposition provides an estimate of goodwill that is consistent with the initial and continuing market valuation of the combined firm.

#### 4.3. Earnings-based approach

In their May 31, 2000 presentation to the FASB, Morgan Stanley Dean Witter, Goldman Sachs and three of the Big 5 accounting firms recommended an alternative approach to the valuation of goodwill. This group recommended a goodwill impairment test based on a residual income (earning-based) valuation approach. The residual income approach below is based on accounting measures, so there is a direct link between goodwill and valuation:

$$\sum_{t=1}^T \frac{(ROE_t - r) * NAV_{(t-1)}}{(1 + r)^t} \quad (1)$$

where NAV equals recorded net asset value before goodwill, ROE equals operating income before depreciation (*Compustat* data item #13) ÷ beginning NAV (including recorded goodwill),  $r$  equals the expected or required return, and  $t$  equals the duration between the acquisition and write-off or revaluation date.<sup>11</sup> This approach relates net asset values, earnings, and reinvestment of free cash flow to valuation. We use the summed abnormal residual operating profits as a measure of the impairment or revaluation of goodwill during the period examined.

Ideally, we would use the company's operating and financial plan as input to determine the required rate of return. Indeed, managers sometimes disclose the effect that the acquisition will have on future profitability. However, because of limited data availability, we use



analysts' consensus forecasts of post acquisition profitability at the acquisition date to estimate the expected rate of return, which includes the consideration of dividends and share repurchases under plans in place at the time of the acquisition. The terminal value is calculated once the expected return reached a level growth rate. The implied revenue and earnings growth are assessed for reliability using industry norms and past realizations. The expected rate of return generally moves toward the cost of equity.

Under this approach, goodwill is impaired if the rate of profitability is permanently below the rates incorporated into the original acquisition value. Conversely, an internally generated asset is created if the rate of profitability is permanently higher than the rates incorporated into the original acquisition value.

## 5. Sample selection

U.S. firms were eligible if they recorded goodwill as part of a purchase business combination. U.K. firms were eligible if they wrote-off goodwill in the initial transaction under SSAP 22. To achieve consistency, we limited both samples to purchase business combinations that occurred between 1990 and 1994. For each transaction, we identified any write-off or revaluation from the acquisition date until the end of fiscal 2001.

U.S. firms were identified as all firms on the *Compustat Primary, Secondary, Tertiary, and Full Coverage Annual Industrial File* that reported goodwill on their balance sheets during any year between 1990 and 1994. We examined all annual report disclosures to obtain both current additions to, and pre-existing carrying values of, purchased goodwill. Other book value data were taken from the annual or quarterly *Compustat* tape. Market prices and returns were obtained from the *CRSP* tapes. This search yielded 3,097 U.S. firm-year observations reporting purchased goodwill. A total of 1,356 firm-year observations were eliminated because no acquisition occurred during the year. Another 165 firm-year observations where a portion of the purchase price was allocated to in-process R&D were eliminated because there was no allocation of purchase price to goodwill.

U.K. firms were identified as those on the *Worldscope* database that reported goodwill write-offs in years 1990 through 1994. Those that revalued were identified by the increase in the revaluation reserve in the shareholders' equity section of the balance sheet. We examined all annual report disclosures to determine that an asset attributable to a particular acquisition was being revalued. We then referenced the *Securities Data Company Mergers and Acquisitions* database and the *Datastream* database to obtain the necessary book values, market values, and market returns data items. This search yielded 563 transactions.

Current increments to goodwill were accumulated from prospectus filings related to the transactions, financial statements filed by acquiring firms, and information included in the *Securities Data Company Mergers and Acquisitions* database. Table 1 suggests that purchased goodwill is an important component of firm value. Goodwill averaged approximately \$199.02 (\$62.17 from prior years + \$136.85 from acquisition year increments) for U.S. firms in the acquisition event year, or approximately 20 percent of the total assets reported. For U.K. firms, goodwill written off before 1990 and during our sample period averaged approximately 15 percent of total assets.



Table 1. Regression variables (\$ millions)

	BV*	GW*	GW <sub>I</sub>	LIAB
U.S. firms				
Mean	\$757.40	\$62.17	\$136.85	\$542.16
Median	\$464.84	\$46.82	\$85.86	\$251.83
Std. deviation	62.81	23.19	21.26	19.84
U.K. firms				
Mean	£582.96	£31.82	£74.86	£291.67
Median	£305.81	£26.59	£61.41	£174.30
Std. deviation	38.22	9.84	7.02	17.82

BV\* is the book value of assets minus the book value of purchased goodwill.

GW\* is the book value of goodwill less the increment attributable to acquisitions in the event year. For U.K. firms, this is the re-created amount of goodwill written off against reserves prior to 1990.

GW<sub>I</sub> is the increase in goodwill in the year of acquisition. For U.K. firms, this is the amount of goodwill written off in the acquisition year.

LIAB is the sum of book values of liabilities and preferred stock during the acquisition year.

The decomposition of goodwill, described earlier, is shown in Table 2. The first column ( $GW_{Total}$ ) shows that increments to purchased goodwill are higher for the 94 write-off firms (0.6984) than for the other firms (0.598). This difference is driven by the higher RESID for the write-off firms (0.3359) than for the other firms (0.1655). The differences in total goodwill and RESID are significant at the .01 level for these subsamples. There is no significant difference between the subsamples for CORE.

In contrast, we find that for the U.K. firms, the 77 revaluing firms had significantly greater total goodwill and CORE than the other firms. These differences are greater at the .01 level. There was no difference in the RESID amounts.

## 6. Results

### 6.1. The magnitude of goodwill write-offs and revaluations

We first examine whether impairments taken by U.S. firms are equivalent to RESID, and whether amounts revalued by U.K. firms are equivalent to the original CORE component. Table 3 reports the results of these comparisons. The average (median) write-off for the 94 firms equaled \$95 million (\$88 million) or 31.9 percent of the purchase price. The average (median) RESID at the time of the acquisition equaled \$89 million (\$76 million). The differences between both the means and the medians are significant at the .01 level. Thus, U.S. firms wrote off more than the amount initially recognized as RESID.

A similar result holds for the U.K. firms that subsequently revalued and recognized an intangible asset acquired in a sample transaction. The average (median) revaluation totaled £61 million (£53 million), or 41.8 percent of the purchase price.<sup>12</sup> The average (median)

Table 2. Mean purchase price components as a percentage of pre-offer target market value

	GW <sub>Total</sub>	CORE	RESID
U.S. transactions ( <i>n</i> = 1, 576)			
Write-off firms ( <i>n</i> = 94)	0.6984	0.3625	0.3359
Others ( <i>n</i> = 1, 482)	0.5598	0.3943	0.1655
<i>p</i> -value for difference	0.0001	0.6294	0.0001
U.K. transactions ( <i>n</i> = 563)			
Revaluation firms ( <i>n</i> = 77)	0.5391	0.3673	0.1718
Others ( <i>n</i> = 486)	0.4380	0.2701	0.1679
<i>p</i> -value for difference	0.0001	0.0001	0.8376

Gross amounts are deflated by the pre-existing market value of the target six trading days prior to the first takeover announcement.

GW<sub>Total</sub> is the excess of the purchase price over the fair market value of the net assets acquired, as disclosed in the annual reports.

CORE is the market value of the target six trading days prior to the first takeover announcement minus the fair value of the net assets acquired (as disclosed in the annual report) plus the cumulated net increase in market value of both the target and acquiring firm, using an 11-day window centered on the initial and all subsequent announcements, if any, during the acquisition period. In 879 of the 1,576 transactions, the net market reaction to the acquirer is positive. In these cases, CORE is constrained to be the excess of the purchase price over the fair market value of the net assets acquired, and RESID equals zero so that the amounts for the transaction will not exceed actual goodwill that is recorded on the financial statements.

RESID is the purchase price of the net assets acquired minus the pre-offer fair market value of the net assets acquired minus CORE. In 879 of the 1,576 transactions, the net market reaction to the acquirer is positive. In these cases, RESID is set equal to zero and CORE is constrained so that the amounts for the transaction will not exceed actual goodwill that is recorded on the financial statements.

Table 3. Goodwill write-offs and intangible asset revaluations

	<i>n</i>	1st quartile	Median	3rd quartile	Mean (% of PP)
U.S. firms					
Write-offs (\$000)	94	\$14,238	\$87,604	\$169,816	\$95,163 (31.90%)
RESID (\$000)	94		\$75,937		\$89,326
Difference			\$11,667***		\$5,837***
U.K. firms					
Revaluations (£000)	77	£17,135	£52,855	£122,378	£60,918 (41.82%)
CORE (£000)	77		£42,914		£56,826
Difference			£9,941***		£4,091***

Write-off and revaluation amounts are taken from annual report disclosures.

\*\*\*Difference is significant at the .01 level based on two sided tests: *t*-statistics are reported for the differences in means and *z*-statistics are reported for differences in medians.

CORE at the time of the acquisition equaled £57 million (£43 million). The differences between both the means and the medians are significant at the .01 level. Thus, U.K. firms revalued more than the amount initially recognized as CORE.

We cannot conclude that these significant differences for U.S. and U.K. firms mean that firms wrote-off or revalued “too much” goodwill. It is possible that post-acquisition performance led to a repricing in the value of CORE, and that this repricing explains the excess write-offs and/or revaluations. A necessary condition for this repricing to occur is that the market could have interpreted post-acquisition performance as a signal of future write-offs or revaluations. The next section examines this issue.

## 6.2. *Is impairment/revaluation associated with changes in the value of goodwill?*

The section above documents that both the U.S. and U.K. firms write-off and revalue goodwill in amounts that exceed the initially recorded RESID and CORE, respectively. This section examines whether post-acquisition “repricing” of CORE explains the “excess” impairment or revaluation. It is reasonable to assume that the market *would* have used post-acquisition performance as a signal of future firm actions because both SFAS No. 121 and APB 17 employed performance-based methods in the impairment tests. However, it is an empirical question whether the market *could* have used post-acquisition performance in this way because firm performance relates to the firm’s activities as a whole and not just the performance of the acquired firm.

**6.2.1. Market-based measure of the write-off.** To investigate this issue, we use the period between the effective date of the business combination and the end of the fiscal year prior to the write-off or revaluation (e.g., the repricing period), to calculate the stock performance for each of the 1,576 (563) firms in our U.S. (U.K.) sample. The repricing period for control firms starts on the acquisition date and ends on the acquisition date plus the average length of the write-off firm repricing period. We then calculate an abnormal return for each firm/transaction relative to the median market performance of all firms in the same two-digit SIC code.<sup>13</sup> The abnormal return is the difference between repricing period cumulative monthly returns between the write-off and control firms.

The average abnormal return for the 94 U.S. firms that reported goodwill impairments, the 77 U.K. firms with revaluations, and the remaining firms from the two countries are shown in Table 4. We found that 86.17 percent of U.S. firms that recognized goodwill impairments underperformed industry averages. These firms had abnormal returns of -13.03 percent (significant at the .01 level). On average, the remaining U.S. control firms neither outperformed nor underperformed their industry counterparts. In contrast, 89.61 percent of U.K. firms that revalued intangible assets outperformed industry averages. These firms averaged two-year positive abnormal returns of 16.38%, significant at the .01 level. The remaining 10.39 percent of the U.K. firms that revalued intangible assets did not realize returns that differed from their industry counterparts. Thus, we conclude that the market could have used post-acquisition performance as a signal of future firm write-offs or revaluations.

Table 4. Market performance of write-off and revaluing firms

	<i>n</i>	RAWF (%)	RAWI (%)	Mean ABNR (%)	<i>t</i> -stat for the Mean	(%) positive ABNR
U.S. firms						
Write-off firms	94	8.61	21.64	-13.03	-2.92***	13.83
All others	1,482	18.58	22.54	-3.04	-0.56	44.42
U.K. firms						
Reval. firms	77	17.10	0.72	16.38	13.54***	89.61
All others	486	7.72	6.88	0.84	0.43	50.49

This table reports, for the period between the effective date of the business combination and the end of the year prior to the write-off or revaluation, raw returns (RAWF), returns for the industry (RAWI), mean abnormal returns (ABNR), *t*-statistics for the mean abnormal return, and the percentage of positive abnormal returns. RAWI is the average for all firms in the same two-digit SIC code. *n* is the number of observations.

If the market reprices goodwill based on performance, then the relatively poor post-acquisition stock performance of U.S. write-off firms suggests that write-offs exceed the initial RESID because the poor performance signals reductions in the value of CORE. Similarly, the relatively strong post-acquisition performance of U.K. revaluing firms suggests that revaluations exceed the initial CORE because the strong performance signals increases in the value of CORE. To examine whether market repricing of CORE after the acquisition explains the difference between write-offs and RESID and the difference between revaluations and CORE, we estimate Eq. (1) from Henning, Lewis and Shaw (2000) for the U.S. write-off and U.K. revaluation firms and the related control firms as follows:

$$MV_j = \gamma_0 + \gamma_1 BV_j^* + \gamma_{2a} GW_j^* + \gamma_{2b} CORE_j + \gamma_{2c} RESID_j + \gamma_3 LIAB_j + \varepsilon_j \quad (2)$$

where  $BV^*$  is the book value of assets minus the book value of goodwill.  $GW^*$  is the book value of goodwill acquired before 1990.  $LIAB$  is the book value of liabilities and preferred stock. The coefficient of interest is  $\gamma_{2b}$ . We first estimate the valuation coefficient of CORE at the time of the acquisition and then in the write-off or revaluation year using Eq. (2). Our estimate of the post-acquisition change in market value of CORE equals CORE on the acquisition date multiplied by the change in the CORE coefficients between the acquisition date and the write-off or revaluation year. Barth and Kallapur (1996) show that scale effects do not bias the coefficient of interest in case such as this since  $BV^*$  and  $LIAB$  are likely more highly correlated with scale than are the goodwill variables. Moreover, they show that in some cases deflation is problematic, so we use undeflated variables in our regression.<sup>14</sup>

The first column in Panel A of Table 5 shows that the CORE coefficients did not differ between the U.S. write-off firms and their control firms or between U.K. revaluing firms and their control firms at the time of acquisition. Column two shows the average CORE coefficient for the subsamples at the end of the year preceding the write-off or revaluation. These results indicate a significant *negative* repricing of goodwill for those firms announcing impairments, since the average CORE coefficient is significantly lower at the end of the fiscal

Table 5. Panel A: Market value regressions of CORE valuation, Panel B: Market value estimations of write-offs and revaluations and Panel C: Residual income estimations of write-offs and revaluations

		Average coefficient				
		<i>t</i>	Event	<i>F</i> statistic		
Panel A						
U.S. firms						
	Write-off firms ( <i>n</i> = 94)	1.8326	1.6117	9.374***		
	All others ( <i>n</i> = 1,482)	1.8817	1.9305	1.304		
U.K. firms						
	Revaluation firms ( <i>n</i> = 77)	1.4768	1.6178	8.183***		
	All others ( <i>n</i> = 486)	1.4692	1.4384	0.837		
		Original CORE	Change in coefficient	Implied change in CORE (% Δ in CORE)	Excess write-off (U.S.) or revaluation (U.K.) (from Table 3)	<i>t</i> -statistic ( <i>p</i> -value)
Panel B						
U.S. firms						
	Write-off firms	94	\$50,086,937	-12.05% (\$6,037,528) (-12.05%)	(\$5,837,196)	0.307 (0.759)
	All others	1,482	\$70,429,636	2.59% (\$1,826,513) (2.53%)	\$0	0.102 (0.918)
U.K. firms						
	Revaluation firms	77	£56,826,354	9.55% (£5,427,206) (9.55%)	£4,091,473	0.519 (0.605)
	All others	486	£43,820,295	-2.10% (£918,637) (-2.10%)	£0	0.823 (0.411)
		<i>n</i>	Residual income or implied change in CORE (%Δ in CORE)	Excess write-off (U.S.) or revaluation (U.K.) (from Table 3)	<i>t</i> -statistic ( <i>p</i> -value)	
Panel C						
U.S. firms						
	Write-off firms	94	(\$4,394,054) (-8.77%)	(\$5,837,196)	0.866 (0.389)	
	All others	1,482	\$2,537,824 (3.52%)	\$0	0.934 (0.350)	
U.K. firms						
	Revaluation firms	77	£4,019,836 (7.07%)	£4,091,473	0.284 (0.777)	
	All others	486	(£517,804) (-1.18%)	£0	0.479 (0.618)	

The average coefficient columns measure the OLS coefficient on CORE both at the time of the acquisition and at the event date (write-off for U.S. firms and revaluation for U.K. firms) using a decomposition of book value as explanatory variables for market value.

The implied change in CORE column equals the percentage change in the CORE coefficient multiplied by the dollar value of CORE at the time of the acquisition transaction.

The excess write-off for U.S. firms equals the write-off (\$95,163,245 on average) minus RESID (\$89,326,049 on average) at the time of the purchase transaction. The excess revaluation for U.K. firms equals the revaluation (£60,917,837 on average) minus CORE (£56,826,364 on average) at the time of the purchase transaction.

Residual income is calculated as  $\sum_{t=1}^T \frac{(ROE_t - r) * NAV_{(t-1)}}{(1+r)^t}$ , where NAV equals recorded net asset value before goodwill, ROE equals operating income ÷ beginning NAV before goodwill, *r* equals the expected rate of return, and *T* equals the duration between the acquisition and write-off or revaluation date.

\*\*\*Significant at the .01 level.

year preceding the impairment charge, decreasing from 1.8326 to 1.6117.<sup>15</sup> In contrast, the coefficient was virtually unchanged for U.S. firms that did not announce write-offs, 1.8817 at the time of the acquisition to 1.9305 at an assumed event date using the same weighted average horizon between the acquisition date and the write-off date for firms in the same industry that did impair.

Similarly, Panel A indicates a significant *positive* repricing of goodwill for those firms announcing revaluations, since the average CORE coefficient is significantly higher at the end of the fiscal year preceding the revaluation, increasing from 1.4768 to 1.6178. In contrast, the coefficient was virtually unchanged for U.K. firms that did not revalue (1.4692 at the time of the acquisition to 1.4384 six years later).

H<sub>1A</sub> hypothesizes that U.S. firm write-offs should equal the portion of goodwill initially identified as RESID plus the post-acquisition decline in CORE. Panel B shows evidence consistent with this hypothesis. Specifically, multiplying the change in the coefficient by the amount of the initial CORE implies an average decrease in the value of CORE for the write-off firms of \$6.038 million, virtually identical to the \$5.837 million excess of the actual write-off over the initial RESID component (from Table 3).<sup>16</sup> The implied change in CORE for the control firms that did not impair was not significantly different from zero.<sup>17</sup>

H<sub>1B</sub> hypothesizes that repricing for U.K. firms should equal the amount initially identified as CORE plus the increase in CORE during the repricing period. Panel B shows evidence consistent with this hypothesis. Multiplying the increase in the coefficient by the amount of the initial CORE implies an average increase in the value of CORE for the revaluation firms of £5.427 million, which insignificantly differs from the £4.091 million excess of the revaluation over the initial CORE component. The implied change in CORE for the control firms that did not revalue differed insignificantly from zero.

**6.2.2. Earnings-based measure of the write-off.** To assess the robustness of the results described above, we also examine whether the earnings-based model predicts the impairments and revaluations, conditional on firms having decided to make an adjustment. As described earlier, we estimate residual income using the approach that FASB originally considered for its impairment test.

Similar to the market-based results, Panel C show that the average residual income for the U.S. write-off firms of \$4.394 million is not significantly different in magnitude from the excess write-off of \$5.837 million. The related control group shows additional consistency between the market-based approach and the earnings-based approach, with no significant change in CORE.

Panels B and C show similar results for U.K. firms. The implied increase in CORE suggested by the earnings-based model of £4.020 million is virtually identical to the excess revaluation of £4.091 million. Again, the control group exhibited no significant repricing.

The results to this point are not consistent with firms managing the size of goodwill write-offs or revaluations. U.S. firms appear to write off amounts not valued by the market at the time of the acquisition plus the portion of goodwill valued by the market that suffers declines in value after the acquisition. Conversely, U.K. firms appear to revalue goodwill valued by the market at the time of the acquisition. The next section investigates whether firms manage the timing of the goodwill write-offs or revaluations.

### 6.3. Explaining the timing of the announcements

**6.3.1. Univariate analyses of SFAS No. 142 transition.** This section examines firm write-offs resulting from the transition period following the issuance of SFAS No. 142 (i.e., the transition sample). This section uses univariate tests to examine this issue, while the next section uses a multivariate logistic regression to examine this issue. Panel A of Table 6 provides descriptive statistics about the 1,482 sample firms in the transition write-off sample. We found that 681 of the 1,482 sample firms announced the results of their transition impairment tests in the first quarter of fiscal 2002. Of the 681 firms announcing their intentions, 205 reported they would recognize an impairment of goodwill.

We further partitioned the subsample of 1,482 transition firms based on their market performance between the acquisition date and the start of the transition year. This partitioning allows us to examine whether performance is associated with the impairment decision in transition to the new standard. Of the 1,482 firms in this sample, 193 exhibited significant, negative abnormal returns. There were 683 firms with negative but insignificant abnormal returns. Finally, 659 firms had positive abnormal returns.

Ninety-three percent (78 out of 84) of the transition firms with significant negative abnormal returns decided to recognize goodwill impairments. In contrast, 31 percent of transition firms with insignificant negative abnormal returns decided to impair and only 12 percent of transition firms with positive abnormal returns decided to impair. The proportion of firms recognizing impairment at transition was significantly greater at the .01

Table 6. Panel A: U.S. sample of 1,482 transition write-off and non write-off firms and Panel B: Comparison of write-off and transition write-off firms

	Negative abnormal returns		
	Significant ( $< -7\%$ ) ( $n = 193$ )	Not significant ( $-0\% < \text{return} < -7\%$ ) ( $n = 630$ )	Positive abnormal returns ( $n = 659$ )
Panel A			
#announcing intentions (total = 681)	84	292	305
#impairing (total = 205)	78	91	36
Impairment $\div$ (RESID + $\Delta$ CORE)	1.351	1.206	0.68
Debt-to-capital of impairing firms	0.53	0.39	0.22
Age of impaired goodwill (years)	10.1	8.4	7.6
	Pre-SFAS142 Write-off ( $n = 94$ )	Post-SFAS142 transition write-off ( $n = 205$ )	$t$ -statistic for difference
Panel B			
CORE $\div$ pre-offer target market value	0.3625	0.3715	0.27
RESID $\div$ pre-offer target market value	0.3359	0.3124	0.58
Impairment $\div$ (RESID + $\Delta$ CORE)	0.9979	1.1688	2.86***
Debt-to-capital of impairing firms	0.4861	0.4134	1.37
Age of impaired goodwill (years)	7.42	8.11	0.94



level for the significantly negative returns group than for the other two groups. These results are consistent with the conjecture that some firms may have avoided prior recognition of goodwill impairment because of the lack of specific GAAP guidelines. Also consistent with the avoidance hypothesis, we find that those firms with significant negative abnormal returns impaired a greater proportion of their market adjusted goodwill, had higher debt-to-capital ratios, and had older goodwill compared to the other two partitions. All of these differences are significant at the .03 level or less. Thus, it appears that the issuance of SFAS No. 142 reduced the latitude that firms had in timing goodwill impairments.

To gain a better understanding of this timing issue, we compared several characteristics of pre-SFAS No. 142 write-off firms to those of transition write-off firms. As Panel B of Table 6 shows, the percentage of the original purchase price classified as CORE (RESID) for the 94 original write-off firms of 36.25% (33.59%) was undistinguishable from the CORE (RESID) of the transition firms (37.15% and 31.24%) respectively.<sup>18</sup> The similarity of the debt ratios and age of the goodwill upon impairment in addition to the CORE and RESID suggests that transition firms simply waited to announce impairments because of the lack of a trigger in the prior rules. More disturbing is the fact that the transition firms announcement impairments that were significantly larger than either the models would have predicted or the amounts taken by earlier firms. Consistent with the “big bath” findings in Elliott and Shaw (1988), this result may reflect managerial incentives to maximize the goodwill impairment in transition, especially since the impairment is shown as a non-operating loss in the year of adoption, but as an operating expense in subsequent years.

**6.3.2. Logistic regression.** We further examine the timing issue by estimating the following logistic regression:

$$\begin{aligned} \text{IMPAIR}_j = & \alpha_0 + \alpha_1 \text{AGE}_j + \alpha_2 \text{RESID}_j + \alpha_3 \text{SIZE}_j + \alpha_4 \text{PERFORMANCE}_j \\ & + \alpha_5 \text{RESID}_j \times \text{PERFORMANCE}_j + \varepsilon_j \end{aligned} \quad (3)$$

where IMPAIR equals one if a firm recognized an impairment, zero otherwise. AGE is the log of the number of months from the acquisition until the write-off or revaluation month. RESID is the purchase price of the net assets acquired minus the pre-offer fair market value of the net assets acquired minus CORE. SIZE is the log of net sales of firm  $j$  at the end of the year preceding the write-off. PERFORMANCE is the cumulative abnormal return of stock  $j$  between the acquisition date and the end of the year preceding the write-off. The performance measurement window for control firms starts on the acquisition date and ends on the acquisition date plus the average length of the repricing period for the write-off firms in the same industry. RESID  $\times$  PERFORMANCE is the interaction of the variables defined above. If  $H_{2a}$  is correct, then firms with high RESID and relatively poor performance are more likely to recognize a write-off than other firms.

We ran the logistic regression on three subsamples including (1) the pre-SFAS No. 142 write-off firms versus the non-write-off firms; (2) the SFAS No. 142 transition write-off firms versus the non-write-off firms; and (3) the pre-SFAS No. 142 write-off firms versus the SFAS No. 142 transition write-off firms. (The dependent variable for the last subsample

above is coded zero for pre-SFAS No. 142 write-offs and one for post-SFAS No. 142 write-offs.)

In estimating the logistic regression on subsamples 1 and 2 above, we expect a positive sign on AGE and RESID, since our write-off sample consisted of older goodwill that had higher proportions of RESID. We also expect a negative sign on PERFORMANCE, since poor performers were more likely to recognize goodwill impairments. The interaction between RESID and performance is expected to be negative, since poor performers with relatively high RESID are least likely to avoid the impairment. The sign on the SIZE variable (relative size of target to acquirer) is indeterminate. We make no predictions for the signs of the coefficients in estimating the logistic regression on subsample 3 above.

Panel A of Table 7 shows that the regression results are qualitatively identical for both groups, which again suggests that transition firms delayed the write-off. The age of goodwill, the magnitude of RESID, post-acquisition performance, and the interaction between performance and RESID are significant and in the expected direction. This supports the relevance of these indicators in predicting impairment. SIZE is not significant, suggesting greater scrutiny given by the press to larger firms did not impact the decision to impair goodwill. Most importantly, the RESID  $\times$  PERFORMANCE interaction is significantly negative for both subsamples, implying that write-offs are significantly more likely when firms have higher RESID and report relatively poor performance, increasing the difficulty of delaying the write-off.

In Panel B of Table 7, we compare the links between these variables and the timing of impairment (1 if early or 0 if at the transition date). Age, RESID, and PERFORMANCE are not different between the two groups, consistent with prior findings that the two groups did not seem to differ. However, SIZE is significant and positive, suggesting that larger firms were more likely to announce impairments in transition to SFAS No. 142. Larger firms are likely to have more reporting units and/or more internally generated goodwill that allowed them to avoid impairments under the pre-SFAS No. 142 rules applied at the enterprise level. Narrowing the unit of analysis to reporting units reduce managers' ability to avoid recognizing goodwill impairments (by offsetting those impairments with internally generated goodwill or goodwill from other reporting units).

**6.3.3. Contracting incentives for U.K. revaluations.** U.K. firms had incentives to announce revaluations to improve the level of their LSE percentage ratios. If one or more of the six selected ratios exceed 25 percent, the acquiring firm must seek shareholder approval to consummate any additional acquisitions. Panel A of Table 8 shows the LSE percentage ratios for our revaluing firms prior to the revaluation. The revaluing firms' ratios were calculated relative to the first acquisition that followed the revaluation. Thus, we examine whether the revaluation was made in contemplation of the next acquisition. As shown, the average asset ratio of 27% would have required shareholder approval of the new acquisition. (While not reported, the revaluation brought the assets ratio down to 22%, on average, thereby allowing each of the acquiring firms to avoid shareholder approval.)

The second column shows the LSE percentage ratios for the 68 firms in our original sample that recognized separately identifiable intangible assets at the time of the acquisition. For these firms, we calculated these ratios using the latest audited published



Table 8. Panel A: U.K. sample descriptive measures\* and Panel B: Logit analysis results of U.K. firms' revaluation decision

	Revaluing firms (before revaluation) (n = 94)	Recognized brands at acquisition (n = 68)	Other firms (n = 401)	
Panel A				
Brands as % of original CORE	1.0720	0.6831	N/A	
Brands as % of repriced CORE	0.9785	N/A	N/A	
LSE percentage ratios				
Assets	0.27	0.22	0.10	
Profits	0.21	0.23	0.08	
Consideration-to-assets	0.19	0.16	0.06	
Consideration-to-market cap	0.17	0.14	0.05	
Gross capital	0.15	0.12	0.05	
Revaluation vs. Others <sup>a</sup>				
	Expected sign	Coefficient estimate	Asymptotic <i>t</i> -statistic	<i>p</i> -value <sup>b</sup>
Panel B				
<i>Intercept</i>	(?)	-2.463	-1.272	-0.207
Age	(?)	0.172	0.908	0.367
CORE	(+)	2.516	1.112	0.135
Size	(?)	-0.483	-0.266	-0.395
LSE	(+)	1.306	1.964	0.027
CORE × LSE	(+)	1.604	2.619	0.005
$\chi^2$ (5 d.f.)		16.215 <sup>c</sup>		
Maddala $R^2$ (%) <sup>d</sup>		21.384		

\*The LSE percentage ratios are as follows: Assets is the net assets of the target divided by the net assets of the acquirer. Profits is the profits (before taxation and extraordinary items) attributable to the net assets of the target divided by the profits of the acquirer. Consideration-to-assets is the consideration paid divided by the net assets of the acquirer. Consideration-to-market-capitalization is the consideration paid divided by the aggregate market value of all the equity shares of the acquirer. Gross capital is the gross capital of the target divided by the gross capital of the acquirer. Transactions with any percentage ratio greater than 25% require shareholder approval.

Variable definitions.

Age = log of the number of months from the acquisition until the write-off or revaluation month.

CORE = CORE is the market value of the target six trading days prior to the first takeover announcement minus the fair value of the net assets acquired (as disclosed in the annual report) plus the cumulated net increase in market value of both the target and acquiring firm, using an 11-day window centered on the initial and all subsequent announcements, if any, during the acquisition period.

Size = Log of net sales of firm *j* at the end of year *t*.

LSE = equals the highest of the five LSE percentage ratios.

CORE × LSE = interaction of the variables defined above.

<sup>a</sup>The revaluation sample consists of the 77 firms that revalued assets subsequent to the acquisition.

<sup>b</sup>Reported *p*-values are based on one-sided tests where the expected sign is indicated.

<sup>c</sup>Exceeds 99th percentile of  $\chi^2$  distribution.

<sup>d</sup>The Maddala  $R^2$  is calculated as  $(1 - L(1)/1(0)^{2/n})$ , where  $L(0)$  is the log-likelihood computed with only a constant term,  $L(1)$  is the log-likelihood computed with the full model, and *n* is the number of observations.

consolidated accounts of the two firms involved in the acquisition. Since the assets ratio approaches the 25 percent threshold (at 22%), perhaps these managers capitalized the separately identifiable intangible assets at the acquisition date to move further away from the threshold in contemplation of future transactions, instead of waiting to revalue. The need for either revaluation or immediate recognition of intangibles by these two groups is documented by the fact that the assets and profits ratios for these firms are significantly greater than those for the remaining sample firms that did neither. This result is consistent with a hypothesis that managers recognize these assets only when there is an incentive to do so.

A related question is whether managers overcapitalize revalued assets. While the answer to this question is case specific and difficult to ascertain, we compare the value of the brands subsequently revalued to the value initially recognized. We find that firms that subsequently revalue brands capitalize amounts that approximate the original CORE (107.2 percent) and repriced CORE (97.8 percent). Neither percentage differs significantly from one. In essence, these firms record amounts approximately equal to the value in the acquisition that is attributable to the acquired brands. This differs from the behavior of firms that recognize brands at the time of the acquisition. They record brands at an amount that is 68.3 percent of the CORE asset. This recognition suggests that while the acquisition of brands is a significant asset, there are other intangible assets as well. The percentages for the revaluing firms exceed the 68.3 percent at the .01 level, suggesting that the immediacy of a future acquisition may provide managers with incentives to maximize the amount of revaluation.

To gain further understanding of these relationships and to control for correlations between the variables, we estimate the following logistic regression for the U.K. firms:

$$\begin{aligned} \text{REVAL} = & \alpha_0 + \alpha_1 \text{AGE}_j + \alpha_2 \text{CORE}_j + \alpha_3 \text{SIZE}_j + \alpha_4 \text{LSE}_j \\ & + \alpha_5 \text{CORE}_j \text{LSE}_j + \varepsilon_j \end{aligned} \quad (4)$$

where REVAL equals one if a firm revalued and zero otherwise; and LSE equals the highest value among the five London Stock Exchange percentage ratios; and the other variables are as previously defined.  $\text{CORE} \times \text{LSE}$  is the interaction of the variables defined above. We expect the proportion of goodwill that is CORE, LSE and, if  $H_{2b}$  is correct, the interaction terms to have positive coefficients. The remaining coefficients have indeterminate signs.

Panel B of Table 8 shows that the LSE ratios and the interaction between the LSE ratio and CORE are significant and positive at the .01 level. These results confirm earlier univariate findings that U.K. revaluing firms respond to contracting incentives to move further away from the LSE percentage ratio thresholds of 25 percent.

## 7. Discussion and conclusions

The purpose of this paper was to provide evidence on two aspects of pre-SFAS No. 142 GAAP that some had criticized: that the rules gave managers “too much” latitude regarding the extent and timing of goodwill write-offs. We use models proposed by Bradley, Desai and

Kim (1988) and Morgan Stanley et al. (2000) to document that changes in the book value of goodwill are significantly related to changes predicted by both market and earnings-based models.

Regarding the *amount* of goodwill write-offs, results indicate that U.S. firm goodwill write-offs and U.K. firm goodwill revaluations exceed the amounts predicted by our models when we consider the initial value of goodwill. However, the actual write-offs and revaluations do not differ from amounts predicted by our models when we consider changes in the value of goodwill after the acquisition. In addition, results support the idea that firm performance after the acquisition provided the market with value-relevant information about recorded goodwill. In contrast, the post-SFAS No. 142 write-offs exceeded the write-offs predicted by our models, perhaps reflecting a perception that the market will view these transition write-offs differently from prior write-offs of goodwill. Thus, our sample provides little evidence that, before SFAS No. 142, firms managed the amount of goodwill write-offs strategically.

Regarding the *timing* of goodwill write-offs, results suggest that U.S. firms delayed goodwill write-offs before the enactment of SFAS No. 142, since a disproportionately large number of firms announced the intent to write-off goodwill during the SFAS No. 142 transition period. In addition, U.K. firms appeared to revalue goodwill (resulting in increasing recorded assets) at times when these firms faced greater shareholder scrutiny in the absence of these revaluations. Thus, it appears that U.S. firms delayed the income-reducing effects of goodwill write-offs, and U.K. firms timed the asset-increasing effects of goodwill revaluations to avoid additional agency costs.

This research provides evidence that the provisions in SFAS No. 142 aimed at curtailing management of the amount of goodwill write-offs may be unnecessary. Specifically, our results suggest that provisions that detail acceptable methods of computing the amount of the goodwill write-off are unlikely to result in material differences in the amount of goodwill write-offs (unless these new rules cause firms to write-off significantly more or less goodwill than our models warrant). In contrast, our results suggest that SFAS No. 142 provisions mandating annual impairment tests are likely to reduce firms' ability to delay goodwill write-offs. In particular, the elimination of enterprise-level goodwill, in combination with the annual review requirement, should result in more timely recognition of declines in the value of recorded goodwill.

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## Notes

1. The first step of the test requires impairment if the carrying amount (including goodwill) of a reporting unit exceeds its fair value. The second step of the impairment test compares the implied fair value of reporting unit goodwill with the carrying amount of that goodwill. An impairment loss is recognized in an amount equal to the excess of the carrying amount of reporting unit goodwill over the implied fair value of that goodwill.
2. A market value method compares a company's (or group of net assets) net book value to the value indicated by its market capitalization (or fair market value); if net book value exceeds market capitalization (or fair market value), the excess carrying amount of goodwill is written off. Cash flow methods employ forecasts of future cash flows, with comparison of the net book value to (a) aggregate cash flow, or (b) the present value of those cash flows.
3. A reporting unit is an operating segment currently disclosed in the footnotes under SFAS No. 131, *Disclosures About Segments of an Enterprise and Related Information*, or one level below the segment level.
4. See the Interpretive Response to Question 4 in *Staff Accounting Bulletin Topic 5CC, Impairments*.
5. See the Interpretive Response to Question 3 in *Staff Accounting Bulletin Topic 5CC, Impairments*.
6. Market performance by operating segment would provide a better proxy, but that information is not available since few segments are publicly traded. Operating performance by operating segment would also be desirable, but this information is not available for all of our post-acquisition period. Market participants face the same data limitation.
7. For example, a Wall Street Journal paper summarized analysts' response to a \$2 billion impairment charge announced on March 28, 2002 by News Corp. as "not expected to alter the fundamental view of News Corp's continuing operations."
8. If capitalized, goodwill would have been subject to amortization. The intangibles did not have to be amortized as long as they retained their value.
9. This measurement of CORE assumes acquisitions have no effect on the wealth of bondholders or other claimants. Kim and McConnell (1977) and Asquith and Kim (1982) provide evidence consistent with this assumption.
10. Since we do not distinguish between going concern and synergy goodwill, the length of the announcement window is not important since run-up in anticipation of an offer is included in CORE regardless. However, average target return from days -40 to -6 relative to the initial announcement do not statistically differ from zero.
11. We include the recorded goodwill in NAV since we are interested in the abnormal operating returns that would imply a change in the goodwill valuation. Goodwill is zero for the UK firms.
12. Interbrand PLC provided us with data on 49 of the 77 observations (64 percent). Specifically, Interbrand PLC gave us the firm name, the purchase business combination in which the asset was originally acquired, the asset that was revalued, the amount of the revaluation, and date on which the revaluation occurred. Their calculations were the amounts used by the firms and were the amounts we compared to CORE.
13. We obtain similar results using the portfolio mean and the matched firm approach described in Barber and Lyon (1997). In the Barber and Lyon (1977) approach, we match sample firms to control firms of similar size in the same two-digit SIC code based on pre-acquisition return on assets and market-to-book measures.
14. In another specification we include the capitalized value of abnormal earnings in an effort to include some measure of internally developed goodwill. The issue is whether the estimated coefficients for the variables of interest are overstated because of the correlation between acquired goodwill and internally developed goodwill. This alternative specification yields results similar to those reported.
15. The coefficients on the remaining components of book value increased over time. However, the RESID coefficient remained insignificant over the entire period.
16. This result may be attributable to the approximate truth of the null or the absence of statistical power. However, a 95 percent confidence coefficient yields confidence intervals of  $x \pm 0.14x$  or narrower for the U.S. write-off firms and the U.K. revaluation firms, corroborating our interpretation of the results.
17. The amounts in columns four and five of Panel, B, when deflated by purchase price, do not differ using a one-tailed *t*-test.
18. The RESID component was significantly higher at the .01 level for the transition write-off firms than for the firms that did not take an impairment.



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