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# The Value Relevance of Accounting Goodwill – Does the Abandonment of Systematic Amortization Make Sense to Investors?

*Motivated by the abandonment of the systematic amortization of goodwill (IFRS 3), we revisit the value relevance of systematic amortization of goodwill. More precisely, contrary to prior literature, which employs data with a maximum amortization period 40 years, we use Finnish data with a maximum amortization period of 5 to 20 years. Our results indicate that the value relevance of goodwill is more pronounced in the case of shorter amortization periods. We conclude that the goodwill amortization practice does provide relevant information for investors, provided that amortization periods are sufficiently short in order to better reflect the economic life of the underlying asset.*

***Key words:*** *Goodwill accounting, value relevance, amortization, financial reporting standards*

## 1. INTRODUCTION

The objective of this study is to revisit the value relevance of systematic amortization of goodwill. Accounting for intangibles, including goodwill, has long been a controversial topic in financial accounting (Powell, 2003). One of the key issues of the debate has been whether jurisdictions should require the amortization of capitalized goodwill over a finite useful period.

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Opponents of the systematic amortization of goodwill – for example Financial Accounting Standards Board of the US and International Accounting Standards Board – believe that straight-line amortization of goodwill over an arbitrary period fails to provide useful information (IASB, 2004: BC 140):

> "…the Board reaffirmed the conclusion it reached in developing ED 3 that straight-line amortisation of goodwill over an arbitrary period fails to provide useful information. The Board noted that both anecdotal and research evidence supports this view. "

On the other hand, for example the Financial Accounting Standards Committee of the American Accounting Association argue that in the absence of reliable impairment testing, systematic amortization should be permitted (Maines et al., 2004, p. 60) and points out the lack of direct research on the purchase method accounting of goodwill (Maines et al., 2004, p. 60). Boyd and McCarthy (2002) note that the abandonment of systematic amortization of goodwill adds volatility to earnings, and that some believe that the Financial Accounting Standards Board eliminated amortization on goodwill to compensate for its requirement to use purchase accounting for business combinations. In addition, Whittington and Yamada from the IASB believe that the benefits of goodwill amortization are its simplicity, its transparency, and its precise targeting of the acquisition goodwill, and that goodwill amortization is less likely to mislead the market than the impairment-only approach required in IFRS 3 (IASB 2004, DO9-DO10). Given this debate on the issue, this paper attempts to shed light on purchase method accounting of goodwill by providing evidence of the impact of the maximum length of the goodwill amortization period on the value relevance of capitalized goodwill and the expensing of goodwill.

This paper tests four hypotheses. The first hypothesis posits that the amortization of new goodwill and impairment write-offs are value relevant. The second posits that the amortization of new goodwill and impairment write-offs of goodwill are more value relevant in the sample with a short amortization period (five years or less according to the main principle of Finnish goodwill accounting standard) than that of the sample with a long amortization period (above five years). The third hypothesis posits that capitalized goodwill is value relevant. Finally, following the approach of the second hypothesis, the fourth hypothesis posits that capitalized goodwill is more value relevant in the sample with short amortization period (five years or less) than that of the sample with long amortization period (above five years). The third and fourth hypotheses are motivated by the fact that the value relevance of goodwill amortization and capitalized goodwill are intertwined: ceteris paribus, value relevant goodwill amortization should maintain the value relevance of capitalized goodwill. The second and fourth hypotheses are inspired by the papers of Barth and Clinch (1996), Lev and Sougiannis (1996), and Bublitz and Ettredge (1989), which provide support to the value relevance of short amortization periods.

The tests are performed with Finnish firm-year samples from a four-year period ending in 2004, which was the last year before IFRS 3 abandoned the systematic amortization in listed firms of the EU. Until 2004, Finland provides an excellent laboratory for tests of the value-relevance effects of the amortization period, due to the (exceptional) Finnish accounting standard concerning the amortization of goodwill, with a five-year maximum amortization period for goodwill as the principle rule, but with a 20-year amortization period as the absolute maximum. The data are collected from Worldscope, I/B/E/S, Extel, Datastream, and SDC (Mergers and Acquisitions) databases. Subsequently the data is manually complemented from annual reports of sample firms.

Using the return specification of Ohlson (1995) this paper addresses the capability of goodwill expensing to provide timely and useful information to investors. For this purpose we examine the association between market-adjusted share returns and goodwill expensing (annual amortization of new goodwill and impairment write-offs of goodwill), incremental to adjusted residual earnings, the annual change in adjusted residual earnings, and the annual change in growth expectations. Second, using regression specification similar to that of Aboody et al. (2004) we examine the value relevance of capitalized goodwill. Empirical results are consistent with the hypotheses, except of the long amortization period sample in H1. Capitalized goodwill, the amortization of new goodwill, and impairment write-offs of goodwill are more value relevant for the 'short amortization period' sub-sample (five years or less) than for the 'long amortization period' sub-sample (more than five years). Taken together, contrary to the basis for the conclusions of IFRS 3 "Business combinations" (IASB, 2004), this paper provides evidence that both capitalized goodwill and systematic amortization of goodwill provides useful information under GAAP with a 5-year maximum amortization period.

The remainder of this paper is organized as follows. Section Two describes goodwill accounting in Finland and changes due to enforcement of IFRS 3, reviews relevant prior literature, and develops hypotheses. The data used in the empirical tests are explained in Section Three, followed by research design in Section Four. Section Five describes the empirical results. The study concludes in Section Six.

## 2. BACKGROUND

### Goodwill accounting in Finland until 2004 and IFRS 3

Finnish accounting standards have included a requirement for goodwill amortization since the Accounting Act 1973/655 (Accounting Act, 1973), but without a reference to a maximum amortization period until the Companies Act 1978 (Companies Act, 1978). The Accounting Act 1973 (Accounting Act, 1973, 3:16) included a requirement to expense costs with long-term effects

during its useful period. While the Act of 1973 did not specifically mention 'goodwill' the Bill for the Accounting Act 1973 explained that costs with long-term effects included research and development and purchased goodwill.

The Finnish Companies Act (Companies Act, 1978) set a maximum amortization period of ten years for capitalized goodwill for limited liability companies, and, in addition, the requirement for systematic amortization became effective in 1993 with the issuance of amendments to the Accounting Act 1973/655 (Accounting Act, 1973). The Accounting Act 1997 (Accounting Act, 1997, Chapters 5:9 and 6:8) set a stringent main principle for allowed amortization period of five years. However, it allowed for an extension of the maximum goodwill amortization period of up to twenty years under certain circumstances. The main principle of a five-year maximum amortization period was to be applied if the firm did not project a longer useful period than five years. As an additional note, the Accounting Act did not allow for reversal of past amortizations. However, it allowed for adjustment of the amortization period of the non-amortized residual. The issuance of IFRS 3 (IASB, 2004), that from 2005 onwards regulates the expensing of the capitalized goodwill of the listed firms in the EU, abandoned the systematic amortization of goodwill in favor of the impairment approach.

The assessment of the relevance of reported goodwill numbers should be done on the basis of an empirical operationalization of the objectives and criteria of standard setters. The Statement of Financial Accounting Concepts No. 2 (FASB, 1980) sets relevance and reliability as the key criteria for choosing from accounting alternatives. According to the Statement, the accounting amount is relevant if it is capable of making a difference in the decisions of financial statement users. Tests of value relevance represent an attempt by a researcher to operationalize the FASB's stated criteria of relevance[1]. In value relevance tests, an accounting amount is deemed value relevant if it has a predicted significant association with share prices (e.g. Barth et al., 2001).

## Related research

Several papers have addressed the issue of the value relevance of goodwill amortization and provided mixed results. Evidence against the value relevance of goodwill amortization has been provided by Jennings et al. (2001)[2], who found that earnings before goodwill amortization ex-

**1** See Barth, Beaver, and Landsman (2001), Holthausen and Watts (2001), and Beaver (2002) for discussion of value relevance research.

**2** Jennings et al. (2001) selected a sample of 3,431 US observations with positive earnings from continuing operations for 1993–1998. They examined whether excluding goodwill amortization from the computation of earnings increases the usefulness of the earnings data to investors and analysts as an indicator of share value. Jennings et al. (2001) regressed share prices, first on earnings per share before goodwill amortization, and next on earnings per share after goodwill amortization. In a statistical test comparing the explanatory powers of those regressions, they found that earnings before goodwill amortization explained more of the cross-sectional variation in share prices than earnings after goodwill amortization. Even when disaggregated from the remainder of reported earnings, goodwill

plained significantly more of the observed distribution of share prices than earnings after goodwill amortization. Also, the evidence of Amir et al. (1993)[3] and Moehrle et al. (2001)[4] support the position of the non-value relevance of goodwill amortization. In an earlier paper of Jennings et al. (1996)[5], in which they used a different research design than in the paper of 2001, Jennings et al. (1996) provided weak evidence for the value relevance of goodwill amortization.

There are also papers suggesting that goodwill amortization provides decision-useful information to investors. Henning and Shaw (2003) show that the amortization period chosen is a reliable predictor of the success of the acquisition in terms of both earnings changes and future stock performance. The evidence of Norris and Ayres (2000) suggests that while goodwill may be viewed positively as an asset, the earnings impact of the amortization of goodwill is bad news to the market, and increases in goodwill amortization have a negative association with returns. Barth and Clinch (1996)[6] show that goodwill amortization reconciliation items between domestic and US GAAP explain share returns for the UK and Australian companies. Both Norris and Ayres (2000) and Barth and Clinch (1996) observed a negative association between share returns and goodwill amortization. An interesting observation regarding the data used in the prior value relevance literature of goodwill is that it is generally either US data (Jennings et al., 1996, 2001; Moehrle et al., 2001, Henning et al., 2000; Norris and Ayres, 2000) or reconciliation data for the form 20-F filings of US listed foreign firms (Amir et al., 1993; Barth and Clinch, 1996).

Empirical data from the US are not representative for all jurisdictions because of the long amortization periods of goodwill applied in the US. The majority (50.7%) of the sample for 1990–1994 of Henning and Shaw (2003) amortized goodwill over the 40-year maximum period allowed by APB 17 (APB, 1970), and only 18.2% of the firms amortized over amortization periods of less than 20 years. In the sample of Norris and Ayres (2000) for 1984–1990, the mean amorti-

amortization provided no explanatory power for observed prices beyond that of earnings before goodwill amortization.

**3** Non-US observations were included in the samples of Amir et al. (1993) and Barth and Clinch (1996), who reported US GAAP reconciliations in Form 20-F filings and were traded in the US. The data of Amir et al. (1993) and Barth and Clinch (1996) were for the years 1981–1991 and 1985–1991, respectively. Amir et al. (1993) reported results of a combined UK and Australian sub-sample, and found that the difference between local GAAP and US GAAP goodwill had a positive relation to market value of equity. Barth and Clinch (1996) reported UK observations separately, and found that the capitalized goodwill reconciliation item of the UK observations was valued as an asset.

**4** Moehrle et al. (2001) examined a sample of 2,421 US observations for 1988–1998. They regressed market-adjusted returns on two alternative performance measures: net income after taxes but before extraordinary items, and net income after taxes but before extraordinary items excluding amortization of intangibles. They found that traditional accounting earnings before extraordinary items and earnings before extraordinary items excluding amortization were equally informative.

**5** Jennings et al. (1996) found weak evidence for goodwill being a wasting asset.

**6** In an examination of international accounting differences, Barth and Clinch (1996, p.157) found evidence suggesting that zero amortization of goodwill for the UK firms, 20-year amortization for the Australian firms, and 40-year amortization under US GAAP, all result in too little amortization expense.

zation period was 35.8 years. In a review of the 1988 disclosures, Duvall et al. (1992) found that only 14% of their sample firms employed amortization periods of less than 40 years[7].

There is evidence suggesting that investors perceive amortization periods for intangible assets as short rather than long. Barth and Clinch (1996, p. 157) suggest that the 40-year amortization of the US and the 20-year amortization of Australia both result in too little amortization expense. Concerning other useful lives of intangible assets, Lev and Sougiannis (1996) show that R&D investments have generally 5–9 years useful period while the useful period differs across industries. As to marketing, earlier empirical evidence indicates that the effect of advertising expenditures on subsequent earnings is short-lived: one to two years (Bublitz and Ettredge, 1989).

This paper addresses the value relevance of goodwill amortization in an institutional setting that differs from the US. Compared with the US, Finland provided an excellent laboratory for tests of the value-relevance effects of short amortization periods, due to the (exceptional) Finnish accounting standard concerning the amortization of goodwill. Extending the prior goodwill amortization literature, this paper revisits the question of whether the amortization of new goodwill and goodwill write-offs are value relevant to investors, and whether the length of the amortization period makes a difference in the investor perceived value relevance.

## Hypotheses development

Theoretically, the systematic amortization of goodwill is in line with the matching principle. Subsequent to business combination and capitalization of goodwill that has risen in the combination, systematic amortization allocates the capitalized goodwill in profit and loss statement. The length of amortization period determines the size of annual expense. Short amortization periods generate larger expense as opposed to long amortization periods. Given that the information about the creation of goodwill is known by investors, we expect that there should be a relation between goodwill amortization and returns only in two instances. First, *the amortization of new goodwill* is unknown to equity investors in the year of business combination, and potentially conveys new information on the benefits of the business combination. During the year of business combination acquirer firm announces business combination to equity investors, and followed by that, analysts and financial press provide additional information about the combination. For example, at the early phase of the combination it may be unclear whether the key personnel will stay in the

**7** The reasons for determining long amortization periods in the US go beyond the scope of this paper. Ayers et al. (2000) reported that 30% of US business combinations were accounted for using the pooling method in 1992–1997. Given the evidence of Lys and Vincent (1995) according to which managers prefer pooling accounting when applicable and are even willing to incur significant costs to avoid the recognition of additional assets and expenses associated with the recognition, one might assume that firms not qualifying for pooling accounting may also try extend amortization life to miminize the decreased accounting income, which results because of goodwill amortization charges.

combined business, how do the key customers of acquired business, and competitors, react to the combination, combined business may be more attractive target for patent infringement claims, organizational cultures or processes may turn out to be complex to combine, and the like. In most combinations, the final accounting of business combination is completed by the end of fiscal year[8]. At the time when annual reports are published, additional information about the combination is disclosed in the notes of financial statement, enabling equity investors to see the managements' view of the expected economic life of the combined business.

Second, subsequent to the fiscal year of business combination, we expect that there is an association between returns and goodwill expensing if firm management perceives that the economic life of goodwill has changed and if equity investors are informed about it. A perceived change can either increase or decrease the anticipation of future economic benefits from the combination. A review of the annual statements of Finnish listed firms, shows that positive changes are not reported in the annual statements in a manner that would an enable empirical testing. However, negative and important changes are reported, and they seam to trigger an adjustment of upcoming annual amortizations in terms of an *impairment write-off*. On the basis of these two expected associations, we set the first hypothesis.

> H1: Amortization of new goodwill and impairment write-offs of goodwill are value relevant for 'short amortization period' and 'long amortization period' sub-samples.

Relying on Norris and Ayres (2000, p. 84), who provide evidence suggesting that the amortization of new goodwill is negatively associated with unexpected returns for the time period surrounding the first earnings release after the merger, we posit that the association between the amortization of new goodwill and returns is negative.

Extending the impairment value relevance evidence of Hirschey and Richardson (2002), who examined impairments on the basis of discretionary announcements taken by US companies during the 1992–1996, we examine whether the impairment write-offs are value relevant in the Finnish sample in 2001–2004. Hirschey and Richardson (2002) found that negative stock-price effects are tied to goodwill write-off decisions, and interpret it indicating that accounting goodwill numbers capture a significant aspect of the intangible dimension of firm value, and suggest that accounting theory and practice is adept at identifying when such intangible assets are impaired. Relying on Hirschey and Richardson (2002) we posit a negative relation between impairment write-offs and market-adjusted returns.



**8** However, e.g. IFRS: 61–65 (IASB, 2004) leaves a possibility for the provisional initial accounting of business combination.

Relying on Barth and Clinch (1996), Lev and Sougiannis (1996), and Bublitz and Ettredge (1989) this paper posits that the amortization period affects the value relevance of goodwill amortization. We assume that the five-year main principle of the amortization period for the Finnish Accounting Act (1997) is meaningful to the value relevance of goodwill amortization and accordingly we create two sub-samples: firm-years with a 'short amortization period' of goodwill (less or equal to five years, according to the main principle of Finnish goodwill accounting standard), and firm-years with a 'long amortization period' of goodwill (more than a five-year amortization period). Next, it is posited that the amortization of new goodwill and impairment of goodwill of the 'short amortization period' sample are perceived as more value relevant than that of the 'long amortization period' sample:

> H2: The amortization of new goodwill and impairment of goodwill are more value relevant in the sample with a short amortization period (less or equal to five years) than in the sample with a long amortization period (more than five years).

The value relevance of capitalized goodwill and goodwill amortization are intertwined. For example, Norris and Ayres (2000) draw inferences for goodwill amortization from the association between abnormal stock returns and acquired new goodwill. In the same spirit, after discussion of the theoretical background of accounting goodwill, we develop two additional hypotheses that relate to capitalized goodwill. Similarly to Jennings et al. (1996), this paper assumes that at the time of acquisition, the amount recorded as *capitalized goodwill* represents the present value of stream of expected cash flows. Following the acquisition, if the capitalized goodwill continues to reflect those expected cash flows, there should be a positive association between equity values and the recorded amounts of goodwill. Jennings et al. (1996) suggested two potential reasons why one would not observe an association between capitalized goodwill and equity values: first, if managers select inappropriately long or short amortization period for capitalized goodwill, and second, if fluctuations in value due to the arrival of new information are large relative to the level of goodwill initially recorded. Following evidence of several papers with US data (Wang, 1993[9]; Chauvin and Hirschey, 1994[10]; McCarthy and Schneider, 1995[11], Jennings et al., 1996[12];

**9** Wang (1993) examined a sample of 136 US firms from the service industry for 1988–1989. He regressed the market value of equity on the firm's non-goodwill assets, goodwill assets, and total liabilities, and the reported significant, above +1 goodwill coefficients for both years.

**10** Chauvin and Hirschey (1994) examined a sample of 1,693 US firms over the period 1989–1991 and reported that in aggregate, and for non-manufacturing industries, capitalized goodwill was considered an asset by investors.

**11** McCarthy and Schneider (1995) examined a sample of 6,216 US firm-years for 1988–1992. They found that capitalized goodwill was valued as an asset in all years, and takes a higher coefficient than the other assets excluding goodwill in two of the five years at a 5% confidence level, and additionally in one of the years with a 10% confidence level.

**12** Jennings et al. (1996) examined a sample of 1,381 US firms for 1982–1988 for the value relevance of capitalized

Vincent, 1997[13]; and Wilkins et al., 1998[14] we posit that capitalized goodwill is considered as an asset by equity investors.

> H3: Capitalized goodwill is value relevant for 'short amortization period' and 'long amortization period' sub-samples.

Then, similarly to H2, we posit that capitalized goodwill of the 'short amortization period' subsample is more value relevant than that of the 'long amortization period' sub-sample:

> H4: Capitalized goodwill is more value relevant in the sample with a short amortization period (less or equal to five years) than in the sample with a long amortization period (more than five years).

## 3. SAMPLE

The analysis of this paper retrieves the sample of firms and data on variables from Thomson One Banker, which is an online database with financial data available from Worldscope, I/B/E/S, Extel, Datastream, and SDC (Mergers and Acquisitions) databases. The sample selection criteria used in this study aim to enhance the power of statistical tests while maintaining sufficient generalizability of the results. The results of the sample selection are reported in Table 1.

Table 1 shows that the country list of Finland in Worldscope includes 150 (561) firms (firm-years) with a positive market value of equity at the fiscal year-end for any of the years 2001 to 2004. Firms in financial services sectors and governmental firms were filtered to increase the homogeneity of the sample because the operations of financial and governmental institutions are substantially different from those of other firms in the sample (Jennings et al., 1996). It reduces the sample by 18 firms (70 firm-years). Because of the research question of this paper, 18 firms (119 firm-years) without capitalized goodwill in their balance sheet at the end of fiscal year are eliminated. Three firm-years were eliminated from the regressions because of their exceptional length. Because of a lack of either time-series data for return calculation, goodwill amortization, or other financial data needed in regressions, 30 (Table 4) and 38 (Table 5) firm-years were

goodwill and 829 firms for amortization of goodwill. Their results were consistent with the hypothesis that investors view capitalized goodwill as an asset that is expected to decline in value for the average firm of their sample.

**13** Vincent (1997) examined a US sample of 61–92 annual observations for the period 1979–1986 for the differences in the equity valuation of purchase versus pooling accounting. Vincent (1997) found that capitalized acquisition premium was value relevant in three subsequent years of business combination, incremental to book value of equity, net income adjusted to amortization of acquisition premium, and amortization of acquisition premium.

**14** Wilkins et al. (1998) examined a US sample of 8,230 observations for 1988–1996, and found with a regression of price on earnings, equity less capitalized goodwill, and capitalized goodwill that capitalized goodwill was value relevant in seven of nine years.

***TABLE 1. Sample Selection.***

| Selection criteria | Number of firms | Firm-years (Table 4) | Firm-years (Table 5) |
|---|---|---|---|
| All Finnish firms with positive market value of equity at the end of the fiscal year in any year during 2001-2004 in the Worldscope database as of September 2005 | 150 | 561 | 561 |
| Non-financial (the first SIC digit other than 6) and non-governmental (the first SIC digit other than 9) firms | -18 | -70 | -70 |
| Firms with no capitalized goodwill at the fiscal year end | -18 | -119 | -119 |
| Firms with no changes in the accounting period end during 2001-2004 | 0 | -3 | -3 |
| Insufficient time series data or goodwill amortization=0 | 0 | -30 | -38 |
| Early adopters of IFRS 3 | 0 | -4 | -4 |
| Sample for preliminary regressions | 114 | 335 | 327 |
| Outliers | 0 | -6 | -7 |
| *Final sample* | *114* | *329* | *320* |

Table 1 describes the data selection steps. The numbers of firms and firm-years used in the regression of Table 4 and Table 5 have been presented separately. The data were retrieved from Thomson One Banker, which is an online database with financial data available from Worldscope, IBES, Datastream, Extel, and other databases. In the first step, we identified all active and inactive firms which have the country code "FIN" (IsInList(tf.CountryCode,"FIN)"), a positive market value of equity at the end of fiscal year in any of the years within 2001-2004 (TselectAny(ws.YrEndMarketCap>0),Y01,Y04)), a first primary SIC-digit that is not 6 (NotIsSIC(ws.PrimarySICCode,"60",...,"69")), that is, the firm is not a financial institution, or 9 (NotIsSIC(ws.PrimarySICCode,"90",...,"99")), that is, firm is non-governmental. Next, those firm-years that have changes in the accounting period length in 2001-2004 (ws.LengthOfFiscalYear=365, where +-one day variance accepted) were eliminated. If a firm did not have sufficient time series data availability (ds.returnindex) it was deleted. Also, firm-years from 2005 were deleted if a company was an early adopter of IRFS 3, because in that case they had started to apply a different goodwill accounting standard than the rest of the sample. Finally, those observations indicated by the Belsley, Kuh, and Welsch (1980) diagnostic as an influential observation (studentized residual greater than |3|, or Cook's D statistic greater than 1) were removed. The 1% extreme percentiles for each of the variables were winsorized by years.



eliminated from the regressions. Finally, four firm-years were deleted because of the early implementation of IFRS 3, after which they applied a different accounting standard than the other sample firms. After these data steps, regressions in Table 4 (Table 5) are run with a preliminary sample of 335 (327) firm-years. As a final data step, to ensure that the results are not sensitive to

***TABLE 2. Determined amortization periods.***

| | All (n=329) | | Single period (n=110) | | Multiple periods (n=219) | |
|---|---|---|---|---|---|---|
| Classes | Obs. | % | Obs. | % | Obs. | % |
| 16-20 years | 76 | 23.1 | 0 | 0.0 | 76 | 34.7 |
| 11-15 years | 58 | 17.6 | 7 | 6.4 | 51 | 23.3 |
| 6-10 years | 104 | 31.6 | 31 | 28.2 | 73 | 33.3 |
| 0-5 years | 91 | 27.7 | 72 | 65.5 | 19 | 8.7 |
| Subtotals | 329 | 100.0 | 110 | 100.0 | 219 | 100.0 |
| Average | | 11.3 | | 6.7 | | 13.0 |
| Median | | 10.0 | | 5.0 | | 11.6 |

Panel A: The amortization period for column single period is hand-collected from notes for annual balance sheets. Amortization lifes are partitioned on the amortization bins of five years. The first column presents all observations used in Table 4 Goodwill amortization. The second column presents amortization periods that were explicitly defined as a single life in the notes for the annual reports of the respective firm: for example "Goodwill is amortized over five years". The third column describes amortization lives that were not explicitly defined in the notes to the financial statements of sample firms. If for example the notes said that "Goodwill is amortized within five years, however, not exceeding 20 years", the sentence was interpreted to be referring to multiple lives of goodwill. In that case the amortization period was estimated by using an algorithm similar to Henning and Shaw (2003) and Duvall et al. (1992) who inferred it from original purchase price of goodwill (aritmetic average of current and previous year) and annual goodwill amortization. The inferred amortization period was fitted within shortest and longest disclosed amortization periods of the respective annual report.

extreme observations, the extreme one percentile of both tails were winsorized for each of the variables (e.g. Lang et al., 2003). Moreover, observations were removed if the Belsley, Kuh, and Welsch (1980) diagnostic indicated that they were influential (a studentized residual greater than |3| or Cook's D statistic greater than 1). This leaves a final sample of 329 (regression in Table 4) and 320 firm-years (regression in Table 5).

Datastream was the source for return data, which were collected from firm return indexes ("RI"). Also, the three-month lagged market values of equity (price close, "UP#S" – times common shares outstanding, "IC") were retrieved from Datastream. Extel company reports and the annual reports of sample firms were the sources for gross goodwill, annual goodwill amortization, and impairment write-offs of goodwill. I/B/E/S was the source for market analysts' growth expectations (EPSMeanFYR1 and EPSMeanFYR2). All the other financial data were retrieved from Worldscope (goodwill, "18280"; intangibles "02649"; amortization of intangibles, "01149"; total assets, "02999"; total liabilities, "03351"; primary SIC code "primarysiccode"; primary SIC 2 "primary-SIC2"; and income before extraordinary items and preferred dividends "01551").

The amortization period of goodwill was estimated by using an algorithm similar to Henning and Shaw (2003) and Duvall et al. (1992) and by inferring it from the original purchase price of goodwill (as an arithmetic average of the current and previous year) and current amortization expense. Subsequently, the estimated amortization period was validated with the audited amortization period in the notes to the financial statement of sample firms. Table 2 Determined amortization periods shows that consistent with Troberg (2003), the mean (median) amortization period for 329 firm-years is 11.3 (10) years. Only 91 firm-years (or 27.7% of the sample) determined a short amortization period (five years or less). Most of those (72 firm years) disclosed it explicitly in the notes to the annual report. Interestingly, none of the firms with a 16 to 20 year amortization period for goodwill (totally 76 firm-years) disclosed the amortization period explicitly.

To enable the examination new goodwill amortization in H1 and H2, we identify 315 (173) business combination events (firm-years) for Finnish listed firms in SDC Mergers and Acquisitions database in 2001–2004. Next, because SDC Mergers and Acquisitions database does not necessarily include all Finnish business combinations, we examine also capitalized goodwill balances of the sample. We assume that there has been a business combination in year *t* if there is an increase in the capitalized goodwill from year *t–1* to *t*. We compute the difference in the ending balances of capitalized goodwill of current and previous year end, and add back the amortization of goodwill of the current year, i.e. ($goodwill_{to}$+ $goodwill\ amortization_{t0}$ – $goodwill_{t-1}$)>0. Finally, by computing the amortization of new goodwill as an increase from previous year goodwill amortization to current year goodwill amortization, we obtain 187 firms with the amortization of new goodwill.

## 5. RESEARCH DESIGN

### Goodwill amortization

In this section, two sets of value relevance tests are developed. First, the ability of goodwill amortization to explain contemporaneous returns is examined. Next, the association between capitalized goodwill and the market values of equity is examined. The empirical tests in this paper are based on the Ohlson residual earnings valuation model (Ohlson, 1995), which is as follows:

$$(1) \qquad MVE_t = BVE_t + \sum_{\tau=1}^{\infty} (1+r)^{-\tau} E_t\left[x_{t+\tau} - r * BVE_{t+\tau-1}\right]$$

Where $MVE_t$ is market value at the end of current period *t*, and $BVE_t$ is the book value of common equity at that time. $x_{t+\tau}$ is the earnings for period t + $\tau$. The firm's required rate on its equity capital is *r* and *E* is the expectation operator. Equation (1) implies that the market value of equity $(MVE_t)$ consists of two components: the current book value of equity $(BVE_t)$ and the sum of net

present values of the period's earnings available for common shareholders less a charge applied to beginning-of-period book value.

First, we derive the association between market values of equity and goodwill in the spirit of Easton and Harris (1991). Easton and Harris (1991) expressed the idea that the market value (*MVE*) and book value (*BVE*) are both measures of the "stock" value of the shareholders' equity as follows:

(2) $$MVE_{it} = BVE_{it} + u_{it}$$

Where $MVE_{it}$ is the share price of firm *i* at time *t*, $BVE_{it}$ is the book value of firm *i* at time *t*, and $u_{it}$ is the difference between $MVE_{it}$ and $BVE_{it}$. Next, the relation between the "flow" variables (accounting earnings and security returns) will be obtained by taking the first differences of the variables in equation (2), yielding:

(3) $$\Delta MVE_{it} = \Delta BVE_{it} + u'_{it}$$

and

(4) $$\Delta BVE_{it} = X_{it} - d_{it}$$

where, $X_{it}$ is accounting earnings of firm *i* over the time period *t–1* to *t*, and $d_{it}$ is dividends paid for the shares of firm *i* over time period *t–1* to *t*. Substituting (4) into (3), rearranging, and dividing by $MVE_{it-1}$ yields:

(5) $$(\Delta MVE_{it} + d_{it}) / MVE_{it-1} = X_{it} / MVE_{it-1} + u''_{it}$$

Note that until equation (5) the development of research design has closely followed Easton and Harris (1991). Because the left-hand side of equation (5) corresponds to the definition of return for the equity investors of firm *i* for the time period *t–1* to *t*, it can and has been replaced by annual returns $(RET_{it})$ in equation (6).

(6) $$RET_{it} = X_{it} / MVE_{it-1} + u''_{it}$$



To enable empirical testing of hypotheses H1 and H2, regression (7) is estimated. Adjusted returns $(RET^{\alpha}_{it})$ represent raw returns $(RET_{it})$ minus the average returns of its annual market portfolio (Brown and Warner, 1980 and 1985). Similarly to Easton and Harris (1991), returns extend

from nine months prior to the fiscal year-end to three months after the fiscal year-end. Adjusted returns $(RET^{\alpha}_{it})$ are regressed on the amortization of new goodwill $(NAGW_{it})$ in year *t*, impairment of goodwill $(IGW_{it})$ in year *t*, the annual change from year *t–1* to *t* in earnings before extraordinary items excluding goodwill amortization $(\Delta X^{\alpha}_{it})$, earnings before extraordinary items in year *t* excluding goodwill amortization $(X^{\alpha}_{it})$, and error $(\varepsilon^{\beta}_{it})$. Note that equation (1) includes the future residual earnings, which Easton and Harris (1991) ignored. To comply with Ohlson (1995), in equation (7) we deduct "normal earnings" from income before extraordinary items $(X^{\alpha}_{it})$, using the return on 10-year government bond of Finland as a risk free interest on the beginning-of-period book value of firm *i*. Similarly to Aboody et al. (2004), we also add a change measure for the future residual earnings $(\Delta GROWTH_{it})$, which is the annual change in the firm *i*'s mean analysts' short term earnings growth forecast three months after the end of the fiscal year.

Next, to enable the examination of the differential value relevance of goodwill expensing of firms with a five-year maximum amortization period as opposed to capitalized goodwill under an amortization period exceeding five years, regression (7) is augmented by a dummy variable $SHORT_D$, which is equal to 1 for observations with a maximum five-year amortization period, and zero otherwise. In regression (7), the dummy variable $SHORT_D$ is multiplied by $NAGW_{it}$, $IGW_{it}$ and $\Delta X^{\alpha}_{it}$, resulting in three interaction variables, $NAGW_{it} * SHORT_D$, $IGW_{it} * SHORT_D$ and $\Delta X^{\alpha}_{it} * SHORT_D$, which enable separate slopes for sub-samples with short and long amortization periods. The interaction variable $\Delta X^{\alpha}_{it} * SHORT_D$ enables the examination of whether statistical results regarding new goodwill amortization $(NAGW_{it})$ and goodwill impairment $(IGW_{it})$ are driven by different value relevance of aggregate earnings measures.

$$
\begin{aligned}
RET^{a}_{it} \;=\; & \beta_0 + \beta_1 NAGW_{it} + \beta_2 NAGW_{it} * SHORT_D + \beta_3 IGW_{it} + \\
& \beta_4 IGW_{it} * SHORT_D + \beta_5 \Delta X^{a}_{it} + \beta_6 \Delta X^{a}_{it} * SHORT_D \\
& + \beta_7 X^{a}_{it} + \beta_8 \Delta GROWTH_{it} + \sum_{k=9}^{13} \alpha_k YEAR\_IND + \varepsilon^{\beta}_{it}
\end{aligned}
\tag{7}
$$

Where,

$RET^{\alpha}_{it}$ is firm *i*'s market-adjusted return, where the returns have been corrected for the returns of the same annual market portfolio to which firm *i* belongs. Monthly returns have been accumulated over a period starting nine months before and ending three months after the end of year *t*.

$NAGW_{it}$ is firm *i*'s goodwill amortization of new goodwill, deflated by the beginning-of-fiscal-year market value of equity.

$SHORT_D$ is a dummy variable, equal to 1 if firm *i* applies a maximum goodwill amortization period of five years, and to 0 for all other observations;

$IGW_{it}$ is firm *i*'s impairment write-off of goodwill, deflated by the beginning-of-fiscal-year market value of equity.

$\Delta X^{\alpha}_{it}$ is change from year $t_{-1}$ to $t_0$ in firm *i*'s residual income before extraordinary items

excluding the amortization of new goodwill, deflated by the beginning-of-fiscal-year market value of equity.
$X_{it}^{\alpha}$ is firm *i*'s residual income before extraordinary items excluding excluding the amortization of new goodwill in year *t*, deflated by the beginning-of-fiscal-year market value of equity.
$\Delta GROWTH_{it}$ is the annual change in the firm *i*'s mean analysts' short term earnings growth forecast three months after the end of the fiscal year.
$YEAR\_IND_k$ represents dummies that identifies three of four years (2001, 2002 and 2003) from time period 2001–2004, and two of three SIC-industries (manufacturing, if the primary first-digit SIC is 2 or 3; services, if the primary one-digit SIC is 7 or 8), and
$\varepsilon_{it}^{\beta}$ is firm *i*'s error term.

Regression (7) includes both levels and change variables on the basis of evidence of Easton and Harris (1991), who show that both earnings levels and changes deflated by beginning-of-fiscal-year share-price are associated with annual returns. The focus in regression (7) is in the coefficients $\beta_1$, the slope coefficients of $NAGW_{it}$, $\beta_2$, the slope coefficient of $NAGW_{it} * SHORT_D$, $\beta_3$, the slope coefficient of $IGW_{it}$, and $\beta_4$, the slope coefficient of $IGW_{it} * SHORT_D$. H1 posits that $\beta_1$ $(NAGW_{it})$ and $\beta_3$ $(IGW_{it})$ are negative. H2 posits that $\beta_2$ $(NAGW_{it} * SHORT_D)$ and $\beta_4$ $(IGW_{it} * SHORT_D)$ are negative.

## Capitalized goodwill

Similarly to Aboody et al. (2004) and Jennings et al. (1996), we operationalize equation (1) to a level version of Ohlson (1995) by using capitalized goodwill $(GW_{it})$, other assets than goodwill $(OTH_{it})$, residual income before extraordinary items $(X_{it})$, growth proxy $(GROWTH_{it})$, and risk measure $(RISK_{it})$ in the right hand side of the equation (8).

$$(8) \qquad MVE_{it} = \gamma_0 + \gamma_1 GW_{it} + \gamma_2 OTH_{it} + \gamma_3 X_{it} + \gamma_4 GROWTH_{it} + \gamma_5 RISK_{it} + \varepsilon_{it}^{\gamma}$$

Where,

$MVE_{it}$ is firm *i*'s market value measured three months after the end of the fiscal year *t*, deflated by the beginning-of-fiscal-year common shareholders' equity.
$GW_{it}$ is firm *i*'s book value of goodwill at the end of fiscal year *t*, deflated by the beginning -of-fiscal-year common shareholders' equity.
$OTH_{it}$ is firm *i*'s book value of total assets excluding goodwill at the end of fiscal year *t*, deflated by the beginning -of-fiscal-year common shareholders' equity.
$X_{it}$ is firm *i*'s residual income before extraordinary items at the end of fiscal year *t*, deflated by the beginning-of-fiscal-year common shareholders' equity.
$GROWTH_{it}$ is firm *i*'s mean analysts' short term earnings growth forecast three months after the end of the fiscal year.
$RISK_{it}$ is firm *i*'s earnings predictability measure, which is calculated in the spirit of the

risk measure of Jennings et al. (1996) on the basis of quaterly sales in $t_{-1}$ in Worldscope.
$\varepsilon_{it}^{\gamma}$ is firm *i*'s error term.

In equation (8) we decompose the book value of equity $(BVE_{it})$ to its components: goodwill $(GW_{it})$, total assets, except of capitalized goodwill $(OTH_{it})$, and use a sales predictability based risk measure $(RISK_{it})$ similarly to Jennings et al. (1996) who examined the value relevance of capitalized goodwill. Further, to satisfy with Ohlson (1995), we deduct "normal earnings" from income before extraordinary items $(X_{it})$, using the return on 10-year government bond of Finland as a risk free interest on the beginning-of-period book value of firm *i*.

Like Aboody et al. (2004) and Jennings et al. (1996) we use market analysts' growth expectations as the basis for the growth measure. Because of lack of long-term growth forecasts, we use only short-term growth forecasts (like Jennings et al., 1996). We use similar approach to Jennings et al. (1996) with our risk measure $(RISK_{it})$, which is based on the standard deviation of quaterly sales. We measure sales predictability over a one-year period $t-1$. If risk measure takes values close to zero, sales are very predictable, and values close to one indicate that sales are very unpredictable.

Next, to enable the examination of differential value relevance of capitalized goodwill firms with short and long amortization periods, regression (9) is augmented with the dummy variable $SHORT_D$, which is equal to 1 for observations with a maximum amortization period of five years, and zero otherwise. In regression (9), the $SHORT_D$ dummy is multiplied by capitalized goodwill $(GW_{it})$ and other assets $(OTH_{it})$ of regression (8), resulting in two interaction variables, $GW_{it} * SHORT_D$, $OTH_{it} * SHORT_D$, which enable separate slopes for sub-samples with short and long amortization periods. The interaction variable $OTH_{it} * SHORT_D$ enables the examination of whether statistical results regarding capitalized goodwill $(GW_{it}$ and $GW_{it} * SHORT_D)$ are driven by different value relevance of aggregate asset measures. We do not have reasons to posit that $OTH_{it} * SHORT_D$ were value relevant.

Industry dummies control for industry-specific effects that are constant over time and for time series correlation among residuals for the same industry. Year dummies control for fixed year effects, for example macroeconomic effects. The use of panel data allows inclusion of both year and industry effects, which mitigate the bias of the coefficients and the standard errors. If these year-effects were correlated with the independent variables, they might bias the regression coefficients. To account for size differences and potential heteroscedasticity problems, equation (9) is divided by the beginning-of-fiscal-year book value of equity, similarly to Kallunki et al. (2004)[15].



**15** Trueman et al. (2000) scaled with end-of-fiscal year book equity, however, Keating (2000) flagged for the possibility that lagged book or market equity were more appropriate for scaling.

This model specification converts the independent variable market value $(\frac{MVE_{it}}{BVE_{it-1}})$ to market-to-book value $(MVE_{it})$, which can be interpreted as a measure of growth opportunities. Current earnings $(X_{it})$ take the form of $(\frac{X_{it}}{BVE_{it-1}})$, that is, return on equity. Hence, the equation has a meaningful economic interpretation, namely, how much do the explanatory variables increase the growth expectations of the firms.

(9)
$$MVE_{it} = \alpha_0 + \alpha_1 GW_{it} + \alpha_2 GW_{it} * SHORT_D + \alpha_3 OTH_{it} + \alpha_4 OTH_{it} * SHORT_D + \alpha_5 X_{it} + \alpha_6 GROWTH_{it} + \alpha_7 RISK_{it} + \sum_{k=8}^{12} \alpha_k YEAR\_IND + \varepsilon_{it}^{\alpha}$$

Where, other variables as in equation (8) except of:
$SHORT_D$ is a dummy variable, equal to 1 if firm *i* applies a maximum goodwill amortization period of five years, and to 0 for all other observations;
$YEAR\_IND_k$ represents dummies that identifies three of four years (2001, 2002 and 2003) from time period 2001–2004, and two of three SIC-industries (Manufacturing, primary first-digit SIC is 2 or 3; Services, primary one-digit SIC is 7 or 8), and
$\varepsilon_{it}^{\alpha}$ is firm i's error term.

The focus of the third hypothesis in regression (9) is on $\alpha_1$, the slope coefficient for $GW_{it}$. It posits a positive sign for $\alpha_1$, implying that capitalized goodwill is value relevant for the sample. The focus of the fourth hypothesis in regression (9) is in $\alpha_2$, the slope coefficient for $GW_{it} * SHORT_D$. It posits a positive sign for $\alpha_2$, which implies that the coefficient of capitalized goodwill in a 'short amortization period' sample is more value relevant than that of the 'long amortization period' sample.

## 6. EMPIRICAL FINDINGS

### Descriptive statistics

Panel A of Table 3 reports descriptive statistics for all regression variables of equation (7). Variables *NAGW* (the amortization of new goodwill), *IGW* (impairment of goodwill), $X^a$ (residual earnings before extraordinary items, where *NAGW* has been added back), and $\Delta X^a$ (the annual change in $X^a$, where *NAGW* has been added back) are reported on a scaled basis. Panel A shows that *NAGW* is 0.66 for the sample of 329 observations. The difference of means of *NAGW* is insignificant (t-value = –1.05) across the sub-samples 'short amortization period' and 'long amortization period'. *IGW* is 0.19 for the sample of 329 observations. The difference of means of *IGW* is significant (t-value = –2.02) across the sub-samples 'short amortization period' and 'long amortization period'. At a glance, it is puzzling why the mean *IGW* (*NAGW*) of the 'long amortization period' sample at 0.26 (0.72) is higher compared to 0.02 (0.54) of the 'short amortization period' sample. However, untabulated logistic regression shows that there is a 57% probability that a firm determines

a long amortization period instead of a short one when the original size of goodwill to total assets increases from one decile to another. Hence, the larger annual amortization of new goodwill and impairment expense can be an outcome of a larger original goodwill rather than e.g. of the determined amortization period. Residual earnings ($X^a$) at –4.04 in 'short amortization period' sample is smaller than that of 'long amortization period' sample (at 3.15).

Panel B of Table 3 reports descriptive statistics for all regression variables of equation (9) except those of industry dummies. Panel B suggests two significant differences in descriptive statistics conditional on the amortization periods chosen. As expected, the 'long amortization period' sample has a larger mean goodwill (*GW*) at 0.22 compared with the mean goodwill (*GW*) at 0.08 of the 'short amortization period' sample. This difference is likely to be an outcome of two effects: slower decrease of capitalized goodwill due to the longer amortization periods, and the larger original amounts of capitalized goodwill in the 'long amortization period' sample. In contrast, other assets than goodwill (*OTH*) at 0.74 are lower than that of 'short amortization period' sample (at 1.05). Significant differences across the sub-samples contrast somewhat with Henning and Shaw (2003), who do not report differences in net-income-to-assets and book-to-market ratio between US sub-samples that determined a 40-year maximum amortization period for goodwill compared with those that determined shorter amortization period.

## Value relevance of new goodwill amortization and goodwill write-offs

Table 4 reports two regressions, which are otherwise equal except that Model 2 includes two industry dummies (*Manuf* and *Services*). The results reported in table 4 are consistent with H1 and H2, except of the long amortization period sample in H1. As regards the coefficient $\beta_1$, the slope coefficient of the amortization of new goodwill $(NAGW_{it})$ is insignificant (t-statistic –1.66 and –1.37 in Model 1 and in Model 2, respectively), suggesting that the amortization of new goodwill for the sub-sample of 'long amortization period' is not value relevant to investors. As posited, coefficient $\beta_2$, the slope coefficient measuring the interaction of the amortization of new goodwill between the 'short amortization period' and 'long amortization period' samples $(NAGW_{it} * SHORT_D)$ is negative (–1.11 in Model 1, and –1.23 in Model 2) and significant (t-statistic –2.20 and –2.46, respectively), suggesting that the amortization of new goodwill for the sub-sample 'short amortization period' is significantly more value relevant to investors than that of the 'long amortization period' sub-sample. Negative and significant $\beta_2$ is consistent with an explanation that the information conveyed by the determination of short amortization period is a bad news to investors because it reveals that management expects the useful life of the goodwill asset to be short.



The slope coefficient of goodwill impairment write-offs, $\beta_3$, for the sub-sample of 'long amortization period' $(IGW_{it})$ is not value relevant to investors. $\beta_3$ is insignificant (t-statistic –0.15 and

***TABLE 3. Descriptive statistics.***

Panel A: Descriptive statistics of variables used in Table 4, which examines goodwill expensing

| | All observations (n=329) | | | Short am. per. (n=91) | | | Long am. per. (n=238) | | | Test of differences | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Mean | Median | Std.Dev. | Mean | Median | Std.Dev. | Mean | Median | Std.Dev. | t-statistics | |
| *RET* | 18.45 | 22.00 | 51.71 | 11.18 | 8.00 | 63.73 | 21.05 | 25.00 | 46.48 | -1.35 | |
| $RET^a$ | 3.56 | 6.23 | 38.71 | -3.21 | -4.77 | 44.69 | 5.78 | 9.93 | 35.95 | -1.72 | |
| *NAGW* | 0.66 | 0.06 | 1.60 | 0.54 | 0.03 | 1.14 | 0.72 | 0.08 | 1.76 | -1.05 | |
| *IGW* | 0.19 | 0.00 | 1.58 | 0.02 | 0.00 | 0.11 | 0.26 | 0.00 | 1.87 | -2.02 | * |
| $\Delta X^a$ | 3.05 | 0.66 | 18.16 | 6.60 | 0.25 | 27.66 | 1.59 | 0.92 | 12.70 | 1.66 | |
| $X^a$ | 1.29 | 4.16 | 17.11 | -4.04 | 2.44 | 23.14 | 3.15 | 4.81 | 13.72 | -2.78 | ** |
| *ΔGROWTH* | -4.48 | 6.14 | 83.57 | -18.61 | 3.25 | 91.80 | 1.00 | 6.96 | 79.68 | -1.80 | |
| *Y2001* | 21.62 | 0.00 | 41.23 | 15.38 | 0.00 | 36.28 | 24.27 | 0.00 | 42.96 | -1.88 | |
| *Y2002* | 25.53 | 0.00 | 43.67 | 30.77 | 0.00 | 46.41 | 23.43 | 0.00 | 42.45 | 1.31 | |
| *Y2003* | 26.73 | 0.00 | 44.32 | 29.67 | 0.00 | 45.93 | 25.94 | 0.00 | 43.92 | 0.67 | |

Panel B: Descriptive statistics of variables used in Table 5, which examines capitalized goodwill

| | All observations (n=320) | | | Short am. per. (n=91) | | | Long am. per. (n=229) | | | Test of differences | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Mean | Median | Std.Dev. | Mean | Median | Std.Dev. | Mean | Median | Std.Dev. | t-statistics | |
| *MCAP* | 702.1 | 130.8 | 1 785.3 | 423.7 | 53.5 | 1 716.6 | 810.0 | 195.0 | 1 813.2 | -1.79 | |
| *MV* | 2.10 | 1.63 | 1.72 | 2.20 | 1.38 | 1.95 | 2.06 | 1.70 | 1.64 | 0.56 | |
| *GW* | 0.26 | 0.16 | 0.33 | 0.08 | 0.03 | 0.11 | 0.34 | 0.22 | 0.36 | -9.95 | ** |
| *OTH* | 0.83 | 0.86 | 0.62 | 1.05 | 0.93 | 0.95 | 0.74 | 0.80 | 0.41 | 3.09 | ** |
| *X* | 0.00 | 0.05 | 0.41 | -0.06 | 0.04 | 0.58 | 0.02 | 0.05 | 0.31 | -1.18 | |
| *GROWTH* | 0.06 | 0.02 | 0.19 | 0.10 | 0.02 | 0.30 | 0.04 | 0.02 | 0.11 | 1.68 | |
| *RISK* | 0.03 | -0.14 | 1.13 | -0.11 | -0.15 | 0.62 | 0.09 | -0.14 | 1.27 | -1.86 | |
| *Y2001* | 0.22 | 0.00 | 0.42 | 0.17 | 0.00 | 0.38 | 0.24 | 0.00 | 0.43 | -1.56 | |
| *Y2002* | 0.26 | 0.00 | 0.44 | 0.31 | 0.00 | 0.47 | 0.23 | 0.00 | 0.42 | 1.47 | |
| *Y2003* | 0.26 | 0.00 | 0.44 | 0.27 | 0.00 | 0.45 | 0.25 | 0.00 | 0.44 | 0.30 | |

Panel A: *RET* is firm *i*'s raw returns measured nine months before to three months after the fiscal year end, $RET^a$ is firm *i*'s market-adjusted return measured nine months before to three months after the fiscal year. *NAGW* is firm *i*'s amortization of new goodwill in fiscal year $t$. *IGW* is the impairment write-off of goodwill in fiscal year $t$. $X^a$ is firm *i*'s residual earnings before extraordinary items in fiscal year $t$, adjusted by the amortization of new goodwill. $\Delta X^a$ is the change from year $t_{-1}$ to $t_0$ in firm *i*'s residual earnings before extraordinary items in year $t$, adjusted by the amortization of new goodwill. *NAGW, IGW,* $\Delta X^a$, and $X^a$ are deflated by the beginning-of-fiscal-year book value of equity. *ΔGROWTH* is the annual change in firm i's mean analysts' short term (from $t_1$ to $t_2$) earnings growth forecast measured three months after the end of the fiscal year. *Y2001* is a dummy variable, which is equal to 1 for firm-years 2001 and zero otherwise. *Y2002* is a dummy variable, which is equal to 1 for firm-years 2002 and zero otherwise. *Y2003* is a dummy variable, which is equal to 1 for firm-years 2003 and zero otherwise. All variables have been presented as variable * 100 for better readability. Panel B: *MCAP* is the market value of equity in millions of euros. *Market value* is the market value of equity measured three months after fiscal year end. *GW* is the year-end capitalized goodwill. *OTH* is the year-end total shareholders' equity less *GW*. *X* is the residual income before extraordinary items for fiscal year *t. Market value, GW, OTH,* and *X* are deflated by the beginning-of-fiscal-year book value of equity. *Growth* is the change from year $t_{+1}$ and $t_{+2}$ in the I/B/E/S mean earnings growth forecast, measured with three months lags. *RISK* is firm *i*'s earnings predictability measure, which is based on the standard deviation of quaterly sales over a one year period $t_{-1}$. *Y2001* is a dummy variable, which is equal to 1 for firm-years 2001 and zero otherwise. *Y2002* is a dummy variable, which is equal to 1 for firm-years 2002 and zero otherwise. Y2003 is a dummy variable, which is equal to 1 for firm-years 2003 and zero otherwise. All continous variables have been winsorized at 1% and 99%. The t-statistic refers to the difference of means between the 'short amortization period' sample and the 'long amortization period' sample. **p<0.01; *p<0.05, two-tailed.

–0.10 in Model 1 and in Model 2, respectively). As posited, coefficient $\beta_4$, the slope coefficient measuring the interaction of impairment write-offs of goodwill between the 'short amortization period' and 'long amortization period' samples $(IGW_{it} * SHORT_D)$ is negative (–23.01 in Model 1, and –25.44 in Model 2) and significant (t-statistic –2.79 and –2.85, respectively), suggesting that the impairment write-offs of goodwill for the sub-sample 'short amortization period' are significantly more value relevant to investors than that of the 'long amortization period' sub-sample. Negative and significant $\beta_4$ suggests that investors react more strongly to unexpected write-off of capitalized goodwill if firm has a conservative (maximum five-year amortization) goodwill amortization policy. A potential explanation to that emerges when we examine the growth expectations of the firms with goodwill write-offs. Firms in the 'short amortization period sample' have higher growth expectations compared to those in the ''long amortization period sample'.[16] The underlying economic rationale that triggered the impairment (e.g. shorter than expected product life cycles or any other negative changes of the purchased businesses compared to the projections at the time of business combination) may be perceived more negatively by investors if firm's market value is highly dependent on the future growth, as opposed to firms with low growth expectations.

Table 4 shows also that annual changes in earnings before extraordinary items excluding goodwill amortization $(\Delta X^{\alpha}_{it})$ is significant (t-statistic 3.23 and 3.32 in Model 1 and Model 2, respectively) and positive (coefficient 1.56 and 1.58, respectively), but the interaction with the earnings measure and short-dummy $(\Delta X^{\alpha}_{it} * SHORT_D)$ is insignificant (t-statistic = –0.17 and –0.10 in Models 1 and 2, respectively). Because of the insignificant $(\Delta X^{\alpha}_{it} * SHORT_D)$, we do not expect that the negative $NAGW_{it} * SHORT_D$ would be driven by earnings changes.

## The value relevance of capitalized goodwill

The results reported in Table 5 are consistent with H3 and H4. As posited in H3 the coefficient of capitalized goodwill $(GW_{it})$ is positive (coefficients 1.47 and 1.41, respectively) and significant (t-values are 4.05 and 3.75, respectively). As posited in H4, the interaction of the short amortization period dummy and capitalized goodwill is also positive (coefficients are 4.10 and 3.28, respectively) and both significant at 5% confidence level (t-value 2.61 and 1.95, respectively). The positive coefficient of interaction variable $(GW_{it} * SHORT_D)$ implies that capitalized goodwill of the 'short amortization period' sample takes a significantly higher coefficient of capitalized goodwill than that of the 'long amortization period' sample. Hence, the capitalized goodwill of the



**16** It should be noted that the number of goodwill write-off firm-years is small, 15 observations. Those applying five year or less amortization period of goodwill are high-tech firms, with an average growth expectation (measured as market-to-book ratio three months after the fiscal year end) at 6.14 (n = 4), which is significantly different (untabulated t-value = 3.14) from the average growth expectations at 2.74 of firm-years (n = 11) applying amortization period exceeding five years.

***TABLE 4. Goodwill expensing.***

Summary statistics from regressions of market-adjusted stock return on the amortization of new goodwill, the impairment write off of goodwill, adjusted residual net income, change in the growth expectations, and year and industry dummies.

$$RET_{it}^{a} = \beta_0 + \beta_1 NAGW_{it} + \beta_2 NAGW_{it} * SHORT_D + \beta_3 IGW_{it} + \beta_4 IGW_{it} * SHORT_D + \beta_5 \Delta X_{it}^{a} + \beta_6 \Delta X_{it}^{a} * SHORT_D + \beta_7 X_{it}^{a} + \beta_8 \Delta GROWTH_{it} + \sum_{k=9}^{13} \alpha_k YEAR\_IND + \varepsilon_{it}^{\beta}$$

| Variable | Pred. sign | Model 1 Coefficient | Model 1 t-statistic | | Model 2 Coefficient | Model 2 t-statistic | |
|---|---|---|---|---|---|---|---|
| *NAGW* | - | -0.47 | -1.66 | | -0.42 | -1.37 | |
| *NAGW*SHORT* | - | -1.11 | -2.20 | * | -1.23 | -2.46 | ** |
| *IGW* | - | -0.17 | -0.15 | | -0.14 | -0.10 | |
| *IGW*SHORT* | - | -23.01 | -2.79 | ** | -25.44 | -2.85 | ** |
| $\Delta X^a$ | + | 1.56 | 3.23 | ** | 1.58 | 3.32 | ** |
| $\Delta X^a$ **SHORT* | | -0.14 | -0.17 | | -0.08 | -0.10 | |
| $X^a$ | + | -0.35 | -1.07 | | -0.38 | -1.17 | |
| *ΔGROWTH* | + | 0.15 | 2.63 | ** | 0.14 | 2.49 | ** |
| *Intercept* | | 0.02 | 0.54 | | 0.05 | 1.07 | |
| *YEAR01* | | 0.08 | 1.50 | | 0.08 | 1.35 | |
| *YEAR02* | | 0.04 | 0.77 | | 0.04 | 0.65 | |
| *YEAR03* | | -0.02 | -0.44 | | -0.03 | -0.55 | |
| *Manuf* | | | | | -0.01 | -0.25 | |
| *Service* | | | | | -0.10 | -1.54 | |
| *n* | | 329 | | | 329 | | |
| Adj.$R^2$ | | 0.10 | | | 0.10 | | |

$RET^a$ is market-adjusted stock return calculated from 12-month time-period ending three months after fiscal-year-end. $NAGW$ is the amortization of new goodwill. $IGW$ is the impairment write-off of goodwill. $X^a$ is the residual income before extraordinary items adjusted by the amortization of new goodwill. $\Delta X^a$ is the change from year $t_{-1}$ to $t_0$ in the residual income before extraordinary items adjusted by the amortization of new goodwill. $NAGW$, $IGW$, $X^a$, and $\Delta X^a$ are deflated by the beginning-of-fiscal-year market value of equity. Similarly to Aboody et al. (2004) we include a growth measure $\Delta GROWTH$, which is is the annual change in firm $i$'s mean analysts' short term (from $t_1$ to $t_2$) earnings growth forecast measured three months after the end of the fiscal year. $SHORT_D$ is a dummy variable, which takes 1 for observations with amortization period not exceeding five years, and zero otherwise. *YEAR_IND* equals 1 if the observation is for the fiscal year or the SIC group $k$ [three of four years (2001, 2002 and 2003) from time period 2001-2004, and two of three SIC-industries (Manufacturing, primary first-digit SIC is 2 or 3; Services, primary one-digit SIC is 7 or 8)], and zero otherwise.T-statistics are based on White (1980) heteroscedasticity-consistent standard errors. **p<0.01; *p<0.05; one-tailed if predicted sign, two-tailed otherwise.

***TABLE 5. Capitalized goodwill.***

Summary statistics from regressions of market-adjusted stock return on the amortization of new goodwill, the impairment write off of goodwill, adjusted residual net income, change in the growth expectations, and year and industry dummies.

$$RET_{it}^{a} = \beta_0 + \beta_1 NAGW_{it} + \beta_2 NAGW_{it} * SHORT_D + \beta_3 IGW_{it} + \beta_4 IGW_{it} * SHORT_D + \beta_5 \Delta X_{it}^{a} + \beta_6 \Delta X_{it}^{a} * SHORT_D + \beta_7 X_{it}^{a} + \beta_8 \Delta GROWTH_{it} + \sum_{k=9}^{13} \alpha_k YEAR\_IND + \varepsilon_{it}^{\beta}$$

| Variable | Pred. sign | Model 1 Coefficient | Model 1 t-statistic | | Model 2 Coefficient | Model 2 t-statistic | |
|---|---|---|---|---|---|---|---|
| *NAGW* | - | -0.47 | -1.66 | | -0.42 | -1.37 | |
| *NAGW*SHORT* | - | -1.11 | -2.20 | * | -1.23 | -2.46 | ** |
| *IGW* | - | -0.17 | -0.15 | | -0.14 | -0.10 | |
| *IGW*SHORT* | - | -23.01 | -2.79 | ** | -25.44 | -2.85 | ** |
| $\Delta X^a$ | + | 1.56 | 3.23 | ** | 1.58 | 3.32 | ** |
| $\Delta X^a$ **SHORT* | | -0.14 | -0.17 | | -0.08 | -0.10 | |
| $X^a$ | + | -0.35 | -1.07 | | -0.38 | -1.17 | |
| *ΔGROWTH* | + | 0.15 | 2.63 | ** | 0.14 | 2.49 | ** |
| *Intercept* | | 0.02 | 0.54 | | 0.05 | 1.07 | |
| *YEAR01* | | 0.08 | 1.50 | | 0.08 | 1.35 | |
| *YEAR02* | | 0.04 | 0.77 | | 0.04 | 0.65 | |
| *YEAR03* | | -0.02 | -0.44 | | -0.03 | -0.55 | |
| *Manuf* | | | | | -0.01 | -0.25 | |
| *Service* | | | | | -0.10 | -1.54 | |
| *n* | | 329 | | | 329 | | |
| Adj.$R^2$ | | 0.10 | | | 0.10 | | |

$RET^a$ is market-adjusted stock return calculated from 12-month time-period ending three months after fiscal-year-end. $NAGW$ is the amortization of new goodwill. $IGW$ is the impairment write-off of goodwill. $X^a$ is the residual income before extraordinary items adjusted by the amortization of new goodwill. $\Delta X^a$ is the change from year $t_{-1}$ to $t_0$ in the residual income before extraordinary items adjusted by the amortization of new goodwill. $NAGW$, $IGW$, $X^a$, and $\Delta X^a$ are deflated by the beginning-of-fiscal-year market value of equity. Similarly to Aboody et al. (2004) we include a growth measure $\Delta GROWTH$, which is is the annual change in firm $i$'s mean analysts' short term (from $t_1$ to $t_2$) earnings growth forecast measured three months after the end of the fiscal year. S$HORT_D$ is a dummy variable, which takes 1 for observations with amortization period not exceeding five years, and zero otherwise. *YEAR_IND* equals 1 if the observation is for the fiscal year or the SIC group $k$ [three of four years (2001, 2002 and 2003) from time period 2001-2004, and two of three SIC-industries (Manufacturing, primary first-digit SIC is 2 or 3; Services, primary one-digit SIC is 7 or 8)], and zero otherwise.T-statistics are based on White (1980) heteroscedasticity-consistent standard errors. **p<0.01; *p<0.05; one-tailed if predicted sign, two-tailed otherwise.

'short amortization period explains roughly three and half times better [(4.10 + 1.47)/1.47 = 3.79 in Model 1, and (3.28 + 1.41)/1.41 = 3.33 in Model 2] the growth expectations of investors than that of the 'long amortization period sample'.

In contrast, the interaction of short amortization period and other assets (*OTHER*SHORT*) is not significant (t-value is 0.08 in Model 1, and 0.32 in Model 2). This suggests that a systematic valuation difference of balance sheet does not drive the differential value relevance of capitalized goodwill, but rather a difference due to the determined amortization period of goodwill.

## Sensitivity checks

This section focuses on the robustness of the results of regression (9) by employing two other specifications. To summarize, the results below yielded similar results with the regression (9).

*Correlated omitted variable problem*. The problems with the correlated omitted variable are more likely in levels than returns regression (Christie, 1987). If an omitted variable were correlated with the book value of goodwill (or expensing of goodwill) and the market value of equity, it would bias the slope. It is possible that such an omitted variable could result in significant coefficients for goodwill and expensing of goodwill even if there were no direct association between book value and expensing of goodwill and market value of equity. Jennings et al. (1996) suggested two potential omitted variables in a value relevance paper on goodwill: the pre-acquisition unrecorded goodwill of the acquiring firm or benefits of the combination that are not reflected in the acquisition price. To address the possibility of an omitted correlated variable problem, this paper also estimates a "fixed effects" version of regression (9) that includes firm-specific intercepts to control for omitted variables that vary across firms, but are relatively constant from year to year. The magnitude of the coefficient measuring the differential slope of capitalized goodwill between the short amortization period sample and the long amortization period sample $(\alpha_2)$ is lower in the "fixed effects" model and hence suggests that an omitted variable problem is present, though the coefficient also remains significant (at 10% confidence level) in the "fixed effect" model.

*Scale effects*. Additionally, on the basis of Barth and Kallapur (1996), who presented evidence that including a scale proxy as an independent variable is more effective at mitigating coefficient bias than deflation, regression (9) is re-specified according to the suggestion of Barth and Kallapur (1996). The main results of regression (9) do not differ because of the tests addressing scale effects.

*Time effects*. It can be suspected that the capitalized goodwill and resulting amortization vary over time due to overall stock market development. In fact, the results turn out to be sensitive to the estimation period. It is possible that hypothesized statistical relations do not show up, because of the small number of annual observations, varying from 73 to 89. Another alternative,

which our empirical design is not powerful enough to reveal, is that there may be differences in the statistical relations from one year to another.

*Multicollinearity.* Diagnostic statistics shows that no multicollinearity is prevalent in our data, because all hypothesized variables have all variance inflation factor (VIF) lower than 2, and other variables maximum VIF of 3.35.

## 7. CONCLUSIONS

Motivated by the abandonment of the systematic amortization of goodwill (IFRS 3), we revisit the value relevance of systematic amortization of goodwill. In the basis for conclusions of IFRS 3 "Business combinations" (IASB, 2004) International Accounting Standards Board voices their assumption that straight-line amortization of goodwill over an arbitrary period fails to provide useful information. On the other hand, the proponents of systematic amortization believe that systematic amortization should be allowed because of its simplicity, transparency, and precise targeting of acquisition goodwill (IASB, 2004, D09-DO10).

The data used in the prior literature (c.f. Jennings et al., 2001, and Moehrle et al., 2001, and others) are not representative of all jurisdictions because they come from a single country (the US) where very long amortization periods were applied. For example in the sample of Norris and Ayres (2000), the mean amortization period was 36 years. Hence, this paper revisits the issue of the value relevance of goodwill amortization by using data with shorter amortization periods

Until 2004, Finland provided an excellent laboratory for tests of the value-relevance effects of amortization period, due to the (exceptional) Finnish accounting standard concerning the amortization of goodwill, with a five-year amortization period as the main principle, and with an absolute 20-year maximum amortization period. Building on the evidence of Barth and Clinch (1996), Lev and Sougiannis (1996), and Bublitz and Ettredge (1989), it is posited that capitalized goodwill, the amortization of new goodwill, and impairment write-offs of goodwill are more value relevant for firms that determine a 'short amortization period' (five years or less) as opposed to a 'long amortization period' (more than five years).

This paper provides evidence that capitalized goodwill, the amortization of new goodwill, and impairment write-offs of goodwill were more value relevant if firms applied a five-year amortization period as opposed to an amortization period exceeding five years. We conclude that the goodwill amortization practice does provide relevant information for investors, provided that amortization periods are kept sufficiently short in order to better reflect the economic life of the underlying assets. ■

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