Do Tax Deductions for Goodwill Impairments Affect Financial Reporting?

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Abstract

We investigate whether special tax deductions for goodwill impairments influence financial reporting decisions. Unlike most countries, Luxembourg allows tax deductions for goodwill impairments without the need to dispose of any assets. We predict and find that multinational firms with subsidiaries in Luxembourg are more likely to write-down goodwill, and write down larger amounts of goodwill on average, than multinational firms without subsidiaries in Luxembourg. However, we find that conditional on recording a goodwill impairment, the amount of each goodwill write-down does not differ between multinational firms with and without Luxembourg subsidiaries. This is consistent with tax deductibility of goodwill impairments inducing more timely, rather than larger, impairments. We contribute to the literature on the interaction between book and tax reporting, the determinants of goodwill impairments, and the effects of book-tax conformity. This is one of the few studies that looks at the mechanisms through which firms avoid tax, in particular, examining a previously unexplored aspect of tax haven usage.

I. INTRODUCTION

We investigate whether tax deductions for goodwill impairments allowed for firms operating in Luxembourg, a country generally considered a tax haven, influence firms' financial reporting decisions. Specifically, we argue that tax deductibility reduces the overall cost of goodwill impairments and therefore examine whether tax deductibility affects the likelihood and magnitude of goodwill impairments. Examining this question is important for several reasons. First, we provide additional evidence on the interaction between tax and financial reporting decisions (e.g., Erickson, Hanlon, and Maydew 2004; Lynch, Romney, Stomberg, and Wangerin 2016; see also Shackelford and Shevlin 2001 for a review) and on managers' goodwill impairment decisions (e.g., Francis, Hanna, and Vincent 1996). Relatedly, we contribute to the literature on book-tax conformity by examining a specific setting where book and tax treatment of impairments conform. As suggested by McNichols (2002), examining a specific account provides additional insight when combined with overall evidence in the area, as provided by Atwood, Drake, and Myers (2010) and others. Second, little research addresses actual tax planning strategies used by firms (see, e.g., Kemsley 1998, Wilson 2009, Robinson 2010, Duxbury 2016, De Simone 2016, and Lynch et al. 2016 for exceptions). We explore a specific tax planning strategy, expanding our understanding of the "black box" of tax strategies that are not well known to academics, the public, or even to corporate executives (e.g., Steele 2013; Graham, Hanlon, Shevlin, and Shroff 2014; Chen, Cheng, Chow, and Liu 2015).[1] Third, we provide insight into the policy debate on tax haven usage and tax competition between countries.

Bergin (2013) and O'Neill (2015) explain that Luxembourg allows tax deductions for

[1] A number of case studies, particularly in the field of law, investigate specific tax strategies of one or a few firms (e.g., Avi-Yonah 2015; Bogenschneider and Heilmeier 2016). In contrast, we examine how a specific tax planning strategy in a large sample of firms affects financial reporting.

financial accounting impairments (see also Loyens & Loeff 2015). Other than Luxembourg, countries generally do not allow tax deductions for goodwill impairments, but only allow deductions 1) over time through amortization, 2) once an asset is disposed of at a loss, or 3) not at all (e.g., Bergin 2013; Internal Revenue Code §197 and related Regulations). Bergin (2013) and O'Neill (2015) provide several anecdotal examples of firms with Luxembourg subsidiaries benefiting from Luxembourg's tax deduction for goodwill impairments. For example, shortly after transferring ownership of certain goodwill to its Luxembourg subsidiary in 2010, AOL wrote off $33 million of goodwill at that Luxembourg subsidiary (Bergin 2013). In 2012, Caterpillar wrote off $580 million of goodwill from an acquisition made by its Luxembourg subsidiary (Bergin 2013; Caterpillar 2012 10-K). Impairments typically generate only financial reporting costs (i.e., reduced earnings per share), with little or no associated benefit. While an impairment at a firm with a Luxembourg subsidiary still results in a financial statement cost to the firm, it also generates a potential cash benefit in terms of tax savings. Further, many U.S. impairments generate no financial reporting tax benefit because they are not tax-deductible at all under U.S. tax law (i.e., generating an unfavorable permanent difference). An impairment at a Luxembourg subsidiary, which is tax-deductible, generates a financial reporting tax benefit in addition to the cash tax savings, reducing the net financial reporting cost of impairment. Thus, firms operating in Luxembourg may be more willing to record financial statement impairments.[2]

Prior research generally finds that firms are willing to incur tax costs to receive financial reporting benefits (e.g., Erickson et al. 2004) and to incur financial reporting costs to receive tax benefits (see Jenkins and Pincus 1998 for a review), though results in this area are mixed

[2] It appears counterintuitive for firms to want to generate tax benefits in low-tax-rate havens. As discussed later, Luxembourg provides low rates for certain income, but has a rate of approximately 30% for other income. Thus, goodwill impairments can generate tax benefits at the relatively high 30% rate. See Section 2.1 for more detail. We acknowledge that our results do not necessarily generalize to all tax havens.

(Shackelford and Shevlin 2001; Graham et al. 2014). Recent literature suggests that nearly all public firms view GAAP measures as more important than saving cash taxes (Graham et al. 2014) making it unclear if managers are still willing to incur financial reporting costs to receive tax benefits. In our setting, managers must incur a financial reporting cost (i.e., impairment) to generate cash tax savings. Our study also extends existing research that examines factors influencing managers' goodwill impairment decisions. Because goodwill impairments are large and subject to managers' discretion (Francis et al. 1996; Hayn and Hughes 2006), it is important to understand their determinants.

Relatedly, this study extends prior research on book-tax conformity. In contrast to prior book-tax conformity literature which relies on small samples or estimates of country level book-tax conformity, we isolate and examine the effects of one specific policy which conforms book and tax reporting in a broad sample of firms. Despite theoretical arguments suggesting benefits to book-tax conformity through reduced earnings management, because managers want to avoid paying additional tax on upwardly managed earnings, empirical research generally finds negative consequences, such as reduced earnings informativeness and increased earnings management, associated with book-tax conformity (e.g., Hanlon, Maydew, and Shevlin 2008). As suggested by McNichols (2002) regarding earnings management, we extend the book-tax conformity literature by examining how conformity of a specific item, goodwill impairments, affects the related financial reporting. Specifically, we expect that allowing tax deductions for goodwill impairments increases the timeliness of goodwill impairments because tax deductible goodwill impairments generate both cash tax benefits and financial reporting tax benefits. Because Luxembourg goodwill impairments are tax-deductible, the financial reporting cost of an impairment at a Luxembourg subsidiary is reduced by the associated tax savings.

Existing academic literature also provides limited insight into the actual tax planning strategies firms use to avoid taxes, leaving a gap in the literature (e.g., Graham et al. 2014). The most commonly studied tax avoidance strategies, tax shelters (e.g., Wilson 2009), are rarely used after the early 2000s (e.g., Morse 2006; Fleisher 2006; Johnson and Zelenak 2009), with limited industry-specific exceptions.[3] Recent research examines details of how firms use transfer pricing rules (De Simone 2016) and foreign tax credit rules (Duxbury 2016) to reduce taxes. While prior literature examines the use of foreign and domestic tax havens to reduce taxes (e.g., Dyreng and Lindsey 2009), specific mechanisms and strategies employed in those havens have not been explicitly studied. We extend this literature by examining a specific mechanism through which firms use tax havens to save taxes.

We test whether firms with Luxembourg subsidiaries have more or larger goodwill impairments than other firms using a sample of publicly traded multinational firm-years with non-zero goodwill balances from 2003 to 2013. We focus on goodwill impairments because these are generally the largest types of impairment and most likely to be subject to management discretion (Francis et al. 1996). In our sample of 13,290 firm-years, approximately 16.9% of firm-years have a Luxembourg subsidiary. These firms have, on average, $2.9 billion of goodwill on their books annually, versus $570 million for firms without Luxembourg subsidiaries. Even though only 16.9% of firm-years have Luxembourg subsidiaries, aggregate goodwill on the books of firm-years with Luxembourg subsidiaries is approximately equal to that

[3] Recent research (Lisowsky 2010; Lisowsky, Robinson, and Schmidt 2013) uses "reportable transaction" disclosures, which consist of "listed" and "non-listed" transactions, to identify tax shelters. While listed transactions represent tax shelters, non-listed transactions are neither necessary nor sufficient to indicate the existence of a tax shelter. For example, routine foreign exchange transactions, and related hedges, are non-listed reportable transactions, as are routine agreements where an advisor to a transaction has requested confidentiality around a transaction. These agreements are common in any type of acquisition, even with routine tax strategies. Lisowsky (2010) notes that the vast majority of reportable transactions are non-listed, even in the early 2000s.

of firm-years without Luxembourg subsidiaries. Further, Luxembourg was the third largest location of U.S. firms' foreign affiliates' profits as of 2012 (Clausing 2016) and one of the top two locations for all firms globally in 2015 (Miles 2016). The importance of goodwill at firms with Luxembourg subsidiaries is even more pronounced among firms listed in the S&P 500. Within these firms, 36.3% have Luxembourg subsidiaries, and S&P 500 firm-years with Luxembourg subsidiaries hold 46.8% of the aggregate goodwill in the entire sample ($5.0 billion per firm-year, on average).[4] Thus, the existence of a Luxembourg subsidiary potentially affects impairment decisions at significant firms relating to substantial amounts of goodwill.

We find that multinational firms with Luxembourg subsidiaries are 1.3% more likely to record a goodwill impairment than multinational firms without Luxembourg subsidiaries. Given that 13.4% of sample observations record goodwill impairments, a 1.3% higher likelihood of impairment represents a 9.9% increase over the baseline. This effect is similar in magnitude to marginal effects on many previously examined determinants of goodwill impairments in our model, such as return on assets, indicating that tax incentives are important relative to those previously documented determinants. Further, including tax incentives in our determinants model generates a statistically significant improvement in model fit. Firms with Luxembourg subsidiaries also record goodwill write-offs that are 0.11% of assets (or $6.1 million) larger than other multinational firms.[5] The average firm in our sample with a Luxembourg subsidiary has 453 million shares outstanding; thus this additional goodwill write-off translates to approximately $0.013 lower earnings per share for these firms, a potentially meaningful difference. However, we find that this larger average goodwill write-off amount is driven

[4] In robustness tests, we examine only S&P 500 firms and find results consistent with our main analysis.
[5] Mean assets in our sample are $5,553 million, times 0.11% equals $6.1 million.

entirely by the increased likelihood of a goodwill write-off. Conditional on a goodwill impairment, we find no difference in impairment amounts between multinational firms with and without Luxembourg subsidiaries. This indicates that tax deductibility of goodwill impairments induces firms to record more timely, rather than larger, impairments.

In additional tests, we examine settings where we expect to find stronger effects of tax deductibility of goodwill impairments. First, we examine results before and after a 2011 change that increased the tax benefits of goodwill impairments. Consistent with predictions, we find that our results are concentrated in the period after the change, when the tax benefits to impairment are largest. Second, we examine results in a subsample of large firms most likely to be sophisticated and able to structure operations to take advantage of Luxembourg's goodwill impairment deduction rules. We find the statistical significance of our results increases in this subsample. These tests provide additional support that our main results are driven by tax benefits associated with Luxembourg's tax deductions for goodwill impairments.

Unfortunately, our estimates of the effect of tax deductibility on the financial reporting of goodwill impairments are biased downward for at least two reasons. First, not all firms disclose their Luxembourg subsidiaries (e.g., Gramlich and Whiteaker-Poe 2013; Holzer 2013). Thus, firms that do not disclose their Luxembourg subsidiaries are miscoded, making the difference between firms with and without Luxembourg subsidiaries appear to be smaller than it actually is. Second, we are unable to specifically identify firms with goodwill in Luxembourg. Thus, some firms with Luxembourg subsidiaries may not actually have goodwill in Luxembourg, adding noise to our measure.

Our results are generally robust when examining several alternative specifications, subsamples, matching techniques, and explanations. Most importantly, we perform several

falsification tests to address concerns that our Luxembourg variable proxies for some aspect of tax havens or European countries unrelated to Luxembourg's rule allowing tax deductions for goodwill impairments. When we replace our Luxembourg variable with an indicator variable for either non-Luxembourg tax havens, Germany, or the U.K., we find no results. This, along with our other additional tests discussed in Section 4.3, suggests that despite potential noise in our Luxembourg proxy, we identify an effect related to Luxembourg's specific tax rules.

We make three contributions to the literature. First, we show that tax deductibility of goodwill induces multinational firms to report more timely goodwill impairments (i.e., incur financial reporting costs) because they receive better cash tax and financial reporting tax outcomes. More timely reporting of goodwill impairments is generally viewed as higher quality accounting, thus our examination of a specific book-tax conformity provision provides evidence that in this case, book-tax conformity increases financial reporting quality. This suggests that book-tax conformity may be beneficial for items with negative financial statement consequences (i.e., items which accelerate deductions) as it reduces the associated financial reporting costs.[6] We also add to the literature on the determinants of goodwill impairment. Second, we provide additional insight into multinational firms' tax avoidance strategies. By using Luxembourg subsidiaries, firms can accelerate tax deductions. Finally, our paper has policy implications. In addition to a low tax rate, Luxembourg's allowance of tax deductions for impairments appears to be one aspect of its tax haven status and a tax competition tool that Luxembourg uses to attract business. Thus, more than just tax rates need to be considered as countries try to stem the "race to the bottom" in corporate taxation; specific policies also warrant consideration.

[6] We acknowledge that this type of taxpayer favorable book-tax conformity is unlikely to gain wide acceptance, and we note that our results may not generalize to taxpayer unfavorable book-tax conformity.

II. BACKGROUND, PRIOR LITERATURE, AND HYPOTHESES

2.1. Background

We begin by discussing background on taxes and goodwill in Luxembourg. Luxembourg currently imposes a corporate tax rate of 29.22%. Over our sample period, this rate has ranged between 28.60% and 30.38% (Trading Economics 2016). While lower than the U.S. rate of 35%, Luxembourg's rate is not substantially lower. However, Luxembourg allows exemptions and deductions for certain dividends, capital gains, and intellectual property income (e.g., royalties) (e.g., Deloitte 2015; Loyens and Loeff 2015; No More Tax 2016). As a result, the effective income tax rate in Luxembourg is below 5% (Clausing 2016).

On one hand, this implies that tax deductions from goodwill are not particularly valuable in Luxembourg. However, this is not necessarily the case. Because certain income is subject to Luxembourg's ordinary rate of approximately 30%, deductions against income taxed at the ordinary rate are highly valuable. Interest income is one of the categories of income that is not eligible for a preferential rate. Because Luxembourg is generally a favorable market for intra-group financing activities (e.g., Loyens and Loeff 2015), a typical tax savings structure consists of a firm establishing a banking center in Luxembourg, which makes loans and charges interest to affiliates outside of Luxembourg. The affiliates are generally allowed interest deductions for the payments to the Luxembourg subsidiary, and the Luxembourg subsidiary can shield its interest income by using goodwill impairment deductions (e.g., Bergin 2013).

Goodwill can be created in Luxembourg in at least two ways. First, a firm's Luxembourg subsidiary can directly acquire an entity (see, e.g., Caterpillar 2012 10-K). Alternatively, through an internal restructuring, a firm can transfer ownership of existing subsidiaries with goodwill to Luxembourg subsidiaries (see, e.g., Bergin 2013). For financial accounting purposes, beginning

in 2011, Luxembourg firms are eligible to use either Luxembourg GAAP or IFRS for filing statutory accounts (PwC 2015). Prior to 2011, Luxembourg GAAP was required. While IFRS is generally similar to U.S. GAAP in recording goodwill impairments, Luxembourg GAAP allows managers to amortize goodwill over the economic life of the goodwill, in addition to recording impairments (PwC 2013). Thus, to the extent firms use Luxembourg GAAP and choose to amortize goodwill fairly rapidly, we are less likely to find results.[7]

2.2. Prior Literature and Hypotheses

Goodwill impairments are one of the largest write-offs to appear in a firm's financial statements and are subject to a high level of management discretion (Francis et al. 1996; Beatty and Weber 2006). As such, a number of studies examine managers' choices surrounding goodwill impairments. For example, Francis et al. (1996) examine how firm performance relates to goodwill impairments, while Beatty and Weber (2006) examine managerial incentives to record goodwill impairments around a new goodwill accounting standard.[8] Hayn and Hughes (2006) and Gu and Lev (2011) find that characteristics of the transactions that create goodwill are associated with subsequent write-offs, and that managers tend to delay write-offs. We extend research on goodwill impairments by examining how a tax policy that allows firms to deduct the goodwill write-off from their taxable income affects the firm's decision to write-off goodwill.

We also examine the interaction between financial accounting and tax reporting. Firms

[7] Luxembourg generally requires a financial statement audit of the statutory accounts used to calculate taxable income (Deloitte 2016). While this may limit the risk of a firm amortizing goodwill over an inappropriately short life to obtain tax benefits, it does not eliminate the possibility. In additional analysis, we examine the pre- and post-IFRS periods separately.

[8] SFAS 142 (FASB 2001), effective for fiscal years beginning after December 31, 2001 and examined in Beatty and Weber (2006), removed the requirement to amortize goodwill for financial purposes, replacing amortization with a requirement to test goodwill at least annually for impairment. For tax purposes, prior to 1993, goodwill was not amortizable. However, certain goodwill created after August 10, 1993 is amortizable for tax purposes. See, for example, Ayers, Lefanowicz, and Robinson (2000), Henning and Shaw (2000), and Weaver (2000) for details and analysis of this tax change.

with Luxembourg subsidiaries have the ability to receive immediate cash tax savings if they record a financial accounting impairment. Prior research shows that managers incur tax costs to generate financial reporting benefits (e.g., Erickson et al. 2004), however, firms prefer to avoid the tax costs when possible (Badertscher, Phillips, Pincus, and Rego 2009). Prior literature also suggests that managers incur financial reporting costs to receive tax benefits, with most studies examining LIFO inventory and compensation choices (e.g., Hunt, Moyer, and Shevlin 1996; Jenkins and Pincus 1998; Austin, Gaver, and Gaver 1998). We note that a tax-deductible goodwill impairment results in a cash tax benefit as well as a financial statement tax deduction, allowing the firm to partially offset the financial reporting cost of goodwill impairment with the associated tax benefit. Because of these benefits to tax deductible goodwill, and based on this prior literature, we make the following predictions in our setting where managers have the ability to incur financial reporting costs (i.e., impairments) to receive tax benefits:

> **H1:** Multinational firms with Luxembourg subsidiaries are more likely to record goodwill impairments than other multinational firms.
> **H2:** Multinational firms with Luxembourg subsidiaries record larger goodwill impairments than other multinational firms.

However, these results are not certain to hold. First, prior studies have not consistently found that tax incentives affect firms' financial reporting (Shackelford and Shevlin 2001). Further, few recent studies examine whether managers incur financial reporting costs to generate tax benefits; in fact, most recent research suggests that managers incur costs to obtain financial reporting benefits (Robinson 2010; Blouin, Krull, and Robinson 2012) and that managers generally focus on GAAP as opposed to cash measures (Robinson, Sikes, and Weaver 2010; Graham et al. 2014). Because we examine a situation where firms incur financial reporting costs to receive tax benefits and the prior literature is somewhat mixed, it is unclear whether tax

incentives will influence firms' financial reporting in our setting.

By examining the interaction of financial accounting and tax reporting, we also examine a specific policy with high book-tax conformity. Prior literature examines the effects of book-tax conformity in small samples subject to a specific law change, or in large samples using estimated book-tax conformity across countries. Despite popular arguments that book-tax conformity will improve financial reporting (e.g., Desai 2005) by subjecting upwards earnings management to taxes thus increasing the cost to upwards earnings management, empirical research generally finds negative consequences to increased book-tax conformity.[9] For example, Hanlon et al. (2008) examine 56 small firms required to increase book-tax conformity by switching from cash to accrual accounting, and find that earnings informativeness decreases for these firms. In general, the policy examined by Hanlon et al. (2008) is taxpayer unfavorable because accrual accounting (for tax purposes) generally accelerates recognition of revenues to a larger extent than deductions.

Subsequent research uses large, cross-country samples of firms and estimated levels of book-tax conformity to show that higher book-tax conformity is associated with less informative earnings and more earnings management (e.g., Atwood et al. 2010; Blaylock, Gaertner, and Shevlin 2015).[10] These large-sample studies use relatively broad measures of book-tax conformity. In contrast, we examine how book-tax conformity in accounting for goodwill impairments affects firms' financial reporting decisions. We believe that examining a specific policy that conforms book and tax reporting, rather than examining an aggregate measure

[9] However, this debate remains unsettled. See Banerjee, Masulis, and Pal (2016) for recent evidence that book-tax conformity improves financial reporting quality.

[10] These studies estimate a country-year average level of book-tax conformity based on underlying firm data. The authors then regress their financial reporting quality measure of interest on the country-year level of book-tax conformity. Holderness (2016) broadly expresses concerns with research designs using country-level averages, highlighting an advantage of our analysis which is based only on firm-level characteristics.

composed of a number of unknown policies, provides additional insight into existing findings and adds new policy implications to the book-tax conformity debate. Specifically, we examine the implications of a taxpayer *favorable* book-tax conformity policy in contrast to the taxpayer unfavorable policy examined by Hanlon et al. (2008); that is, we examine a policy that reduces the costs of recording negative financial information, potentially increasing the likelihood that firms' record the negative information in a more timely manner. Aggregate measures do not allow determination of whether the book-tax conformity is taxpayer favorable or unfavorable and can mask different firm responses to favorable versus unfavorable book-tax conformity. McNichols (2002) makes a related observation in the earnings management area, suggesting that future research use specific, rather than aggregate, accruals.

In addition to extending research on the determinants of goodwill impairments, the interaction between financial and tax reporting, and book-tax conformity, we provide new insight into specific policies used by firms to avoid taxes. This expands on recent work examining specific tax planning strategies. For example, Lynch et al. (2016) find that firms with stronger tax incentives increase allocations to depreciable assets in acquisitions, reducing their future tax liability. Similarly, Henning and Shaw (2000) show that, following the enactment of laws allowing goodwill amortization for tax purposes, firms increase allocations to goodwill in acquisitions. Robinson (2010) examines firms claiming low-income housing tax credits and their preferences for using accounting methods that generate benefits without affecting pre-tax book income. Kemsley (1998) shows that firms locate their production facilities in a way which increases their ability to utilize foreign tax credits in the U.S.[11]

[11] Several studies (e.g., Maydew 1997) investigate strategies involving intertemporal income shifting around U.S. tax law changes, and the interactions between financial reporting and tax incentives in these settings. Since these tax planning opportunities are one-time events, as opposed to recurring, we do not discuss them in depth here.

Recent research suggests that tax havens, in general, reduce worldwide taxes, although the effects are not entirely consistent across all tax havens (Dyreng and Lindsey 2009). Firms with multinational operations generally pay lower taxes (Rego 2003) and are able to shift income to lower tax jurisdictions (e.g., Klassen and Laplante 2012). However, until recently, very little research has examined the specific mechanisms through which multinational firms avoid taxes. De Simone (2016) examines the mechanisms firms use to shift income, finding that IFRS adoption broadens the number of comparable firms available to support tax-favorable transfer prices. Duxbury (2016) shows that, contrary to common belief, foreign subsidiaries can be structured so that repatriated earnings reduce U.S. tax liability through strategic foreign tax credit usage. We extend this line of literature by examining a specific mechanism through which firms use foreign tax havens to reduce taxes. Aside from Kemsley (1998), Henning and Shaw (2000), Robinson (2010), De Simone (2016), Duxbury (2016), and Lynch et al. (2016), most academic investigations of specific corporate tax planning strategies involve tax shelters (e.g., Wilson 2009; Brown 2011). However, tax shelters are rarely used after the early 2000s (e.g., Morse 2006; Fleisher 2006; Johnson and Zelenak 2009). Thus, we know little about firms' current tax planning strategies.

III. RESEARCH DESIGN

3.1 Sample Selection

Our sample consists of multinational firms with and without Luxembourg subsidiaries. We obtain all multinational firm-years in Compustat from 2003 to 2013 reporting positive total assets and positive goodwill. We define multinational firm-years as those reporting non-zero, non-missing pre-tax foreign income, foreign taxes, or deferred foreign taxes. We begin our sample in 2003 so firms consistently account for goodwill under SFAS 142, and we end in 2013

because that is the last year with available Exhibit 21 (subsidiary location) data. Further, this time period involved a large and increasing amount of foreign activity and foreign tax planning. We identify firm-years with Luxembourg subsidiaries using Scott Dyreng's Exhibit 21 data. We then eliminate firm-years missing CRSP, Compustat, or Exhibit 21 data required for regressions. Lastly, we eliminate firm-years with data errors in goodwill impairments (i.e., Compustat reports positive impairments). This leaves a sample of 13,290 firm-years. Table 1 presents the sample selection process.

INSERT TABLE 1 HERE

3.2 Goodwill Impairments Models

We test our hypotheses using the following models, where we test hypothesis one (two) using a logit (Tobit and ordinary least squares (OLS)) model[12]:

$$\begin{aligned} IMPAIR_{i,t+1} = {} & \beta_0 + \beta_1 LUX_{i,t} + \beta_2 ROA_{i,t} + \beta_3 12\_MONTH\_RET_{i,t} + \beta_4 STD\_RET_{i,t} + \\ & \beta_5 SPECIALIST_{i,t} + \beta_6 MTB_{i,t} + \beta_7 GW\_PCT_{i,t} + \beta_8 SIZE_{i,t} + \beta_9 LEV_{i,t} + \\ & \beta_{10} LOSS_{i,t} + \beta_{11} BIGN_{i,t} + \beta_{12} SALES\_CHG_{i,t} + \beta_{13} LN\_SEGMENTS_{i,t} + \\ & \beta_{14} RECENT\_ACQ_{i,t} + \beta_{15} YEAR\_FE_t + \beta_{16} IND\_FE_i + \varepsilon \end{aligned} \quad (1)$$

where *i* and *t* represent firm and time subscripts and *IMPAIR* represents one of three variables: *IMPAIR_DUM* (logit), *IMPAIR_PCT* (Tobit), and *IMPAIR_PCT_RANK* (OLS). In our logit model, *IMPAIR_DUM* equals one if the firm reports a goodwill impairment in year *t+1* and zero otherwise. In our Tobit model, *IMPAIR_PCT* represents the year *t+1* goodwill impairment multiplied by negative one, so all impairment amounts are positive, scaled by assets. In our OLS model, *IMPAIR_PCT_RANK* represents the ranked size of a firm-year's *IMPAIR_PCT* relative to

[12] Consistent with prior research, we use a Tobit model when examining the size of the goodwill impairment because it is limited between 0% and 100%. This is sometimes referred to as a type I Tobit. See Wooldridge (2010) for details.

all other goodwill impairments in that year. Because goodwill impairments are highly skewed, we use ranked variables to control for the possibility that outliers affect our results. *LUX* is an indicator variable equal to one if the firm-year has a Luxembourg subsidiary and zero otherwise. This is our proxy for the tax deductibility of goodwill. We predict in our hypotheses that *LUX* will have a positive coefficient as the likelihood and amount of goodwill impairments is positively associated with its tax deductibility (i.e., the presence of Luxembourg subsidiaries).

Our control variables are consistent with prior literature on goodwill impairments (e.g., Beatty and Weber 2006; Hayn and Hughes 2006; Ramanna and Watts 2012; Adams 2015).[13] *ROA* is income before extraordinary items divided by average total assets. *12_MONTH_RET* is the firm's return over fiscal year *t*. Because *ROA* and *12_MONTH_RET* measure performance, we expect that higher performance is negatively associated with goodwill impairments and thus expect a negative relation in the models (Beatty and Weber 2006; Hayn and Hughes 2006). *STD_RET* is the standard deviation, or volatility, of daily returns over fiscal year *t*. We expect volatility to reflect firm risk, increasing the likelihood of an impairment as well as the potential size of the impairment, indicating a positive relation with the likelihood and amount of goodwill impairment (Beatty and Weber 2006).

SPECIALIST is an indicator variable equal to one if the firm's auditor is an industry specialist and zero otherwise. We expect that specialists increase the quality of accounting information, leading to more timely and larger impairments (Stein 2013). *MTB* is the market value of equity divided by the book value of equity. Because goodwill impairments occur, by definition, when book value exceeds market value, firms with lower *MTB* ratios have higher risk

[13] All control variables are measured in the year prior to the goodwill impairment and thus are not affected by the impairment.

of impairment.[14] We expect that *MTB* has a negative association with the likelihood and amount of goodwill impairment (Beatty and Weber 2006). *GW_PCT* is the amount of goodwill as a percentage of total assets. Because larger goodwill presents more opportunity for impairment, we expect this to be positively related to the likelihood and amount of goodwill impairment.

SIZE is the natural logarithm of the firm's market value of equity at the end of year *t*. *LEV* is the firm's total liabilities over total assets at the end of year *t*. We do not make directional predictions on the coefficients of *SIZE* and *LEV*. *LOSS* is an indicator variable equal to one if the firm experienced a loss in year *t* and zero otherwise; we expect a positive coefficient as financial distress increases the likelihood and size of goodwill impairments. *BIGN* is an indicator variable equal to one if the firm is audited by one of the Big 4 accounting firms and zero otherwise (Francis and Yu 2009). As with *SPECIALIST*, we expect that *BIGN* auditors provide higher quality audits and therefore more timely and larger impairments. We predict a positive association with the likelihood and amount of goodwill impairment. However, given our sample consists of multinational firms, there is likely little variation in *BIGN*.

SALES_CHG is the change in sales from period *t-1* to *t* (Hayn and Hughes 2006). As with other performance measures (e.g., *ROA*) we expect *SALES_CHG* to be negatively associated with the likelihood and size of impairments. *LN_SEGMENTS* is the log of the number of business segments identified for each firm. We make no directional prediction on *LN_SEGMENTS* consistent with prior literature (Beatty and Weber 2006). Finally, we control for recent acquisition activity by including *RECENT_ACQ*, which is the sum of acquisitions made over each of the last three years scaled by total assets. We make no prediction on *RECENT_ACQ*

[14] *MTB* is not a perfect indicator of impairment because impairments are based on the fair market value of a firm's reporting unit versus that unit's book value, not based on the firm's total fair market value and book value.

as larger amounts of recent acquisitions could indicate more activity requiring impairment or could indicate more goodwill that is priced closer to the fair market value (i.e., acquisition price) and thus less need for impairment. *YEAR_FE* represents year fixed effects and *IND_FE* represents industry fixed effects based on two-digit SIC code.

IV. RESULTS

4.1 Descriptive Statistics

Table 2 presents descriptive statistics for the 13,290 firm years used to estimate Equation 1 in our full sample. Firms with Luxembourg subsidiaries are distinct from those without Luxembourg subsidiaries in several ways.[15] In general, the descriptive statistics show that firms with Luxembourg subsidiaries are larger and more profitable than firms without Luxembourg subsidiaries. Thus, it is important to control for variables related to size and profitability, which we do in our multivariate tests in Section 4.2. Most importantly for our study, we find that firms with Luxembourg subsidiaries (i.e., with tax deductible goodwill impairments) are more likely to record goodwill impairments (p-value < 0.10), consistent with hypothesis one. However, we find inconsistent results for hypothesis two. The size (raw and ranked) of goodwill impairments are unexpectedly smaller in the group of firms with Luxembourg subsidiaries, although the differences are not always significant. However, these are univariate statistics that do not control for other factors that affect goodwill impairments; thus we draw our main inferences from the multivariate tests presented in Section 4.2

INSERT TABLE 2 HERE

Table 3 presents correlations for the regression variables. As expected, the three dependent variables representing *IMPAIR* are highly correlated with one another. Consistent with

[15] To address these differences, we also examine several matched subsamples in Section 4.3.

the descriptive statistics in Table 2, *LUX* is significantly negatively correlated with losses (*LOSS*) and significantly positively correlated with size (*SIZE*) and profitability (*ROA*). Consistent with the descriptive statistics, *LUX* is marginally positively correlated with the likelihood of impairment (*IMPAIR_DUM*, p-value < 0.10, one-tailed), consistent with hypothesis one. Also consistent with the descriptive statistics, the correlations between *LUX*, *IMPAIR_PCT*, and *IMPAIR_PCT_RANK* are inconsistent with our expectations. Finally, virtually all control variables are correlated with *LUX*, *IMPAIR_DUM*, *IMPAIR_PCT*, and *IMPAIR_PCT_RANK* indicating the importance of controlling for them in a multivariate model. Thus we base our conclusions on the multivariate results presented in Section 4.2.

INSERT TABLE 3 HERE

4.2 Multivariate Results

Table 4, column 1 presents the results from estimating Equation 1 using a logit model of the likelihood of goodwill impairment with *IMPAIR_DUM* as the dependent variable. Consistent with hypothesis one, multinational firms that receive tax benefits for goodwill impairments (i.e., with Luxembourg subsidiaries) are more likely to record goodwill impairments than other multinational firms (p-value = 0.079). Specifically, multinational firms with Luxembourg subsidiaries are 1.33% more likely to record such impairments. Given that the baseline percentage of impairment in the full sample is 13.42%, the existence of a Luxembourg subsidiary represents a 9.9% increase over the baseline likelihood of impairment. The magnitude of this effect is largely consistent with the effects of previously explored determinants of impairment such as *ROA* and *SPECIALIST*. Using likelihood ratio tests, we find that including *LUX* in our

model significantly improves the model fit (p-value = 0.081, untabulated), further suggesting that tax rules are an important, previously unexplored determinant of impairment decisions.[16]

Column 2 presents the results from estimating Equation 1 using a Tobit model with *IMPAIR_PCT* as the dependent variable measuring the amount of goodwill impairments. Consistent with hypothesis two, we find a significant positive relationship between Luxembourg subsidiary usage (i.e., tax deductibility of goodwill impairments) and *IMPAIR_PCT* (p-value = 0.068), suggesting that firms benefiting from tax deductions for goodwill impairments have larger impairments. Untabulated marginal effects indicate that firms operating in Luxembourg have goodwill impairments that are 0.11% of assets larger than other multinational firms. At the mean sample assets of $5,553 million, this translates to approximately $6.1 million in additional goodwill impairments. Finally, we present results from estimating Equation 1 using an OLS model with *IMPAIR_PCT_RANK* as the dependent variable in column 3. Again, we find that firms operating in Luxembourg (i.e., with tax deductible goodwill impairments) have significantly larger impairment amounts (p-value = 0.047), with these firms having goodwill impairments ranked 11 places larger than other firms. In sum, results support both hypothesis one and two: firms operating in Luxembourg record more and larger goodwill impairments.[17] This suggests that tax deductibility is an important determinant of goodwill impairments.

INSERT TABLE 4 HERE

4.3 Additional Analysis

[16] All logit, Tobit, and OLS results in this section are also robust to controlling for foreign income scaled by total assets. Because requiring foreign income drops additional observations, we do not include this variable in our main tests. Logit, Tobit, and OLS results in this section are also robust, and in fact more statistically significant (*LUX* p-values < 0.035), when scaling by sales instead of assets for all scaled variables.

[17] While we believe that examining multinational firms only is most appropriate for our research question as only multinational firms have the opportunity to establish a Luxembourg subsidiary, results are unchanged if we include all domestic firms with goodwill balances.

4.3.1 Supplemental Tests

In order to get a more complete picture of how the tax deductibility of goodwill impairment (i.e., Luxembourg subsidiaries) affect firms' goodwill impairment decisions, we re-estimate our Tobit and OLS models using only firms that report a goodwill impairment in Table 5. This prevents the likelihood of goodwill impairment from affecting our results. That is, the coefficients in the main Tobit and OLS models partially capture the likelihood of goodwill impairment. Because we find that firms with Luxembourg subsidiaries are more likely to record a goodwill impairment, the positive and significant coefficients we find in the Tobit and OLS models could be partially driven by more frequent impairments by firms with Luxembourg subsidiaries. We find that this is in fact the case; conditional on having a goodwill impairment, the *LUX* coefficient is insignificant in the Tobit and OLS regressions (*p*-values>0.29).[18] Thus, the increased size of goodwill impairments we document earlier is a result of more frequent impairments by firms with Luxembourg subsidiaries; the amount of each individual impairment does not differ between firms with and without Luxembourg subsidiaries. This suggests that tax deductions for goodwill impairments (i.e., taxpayer favorable book-tax conformity) lead to more timely recognition of impairment. That is, goodwill impairments at Luxembourg subsidiaries does not appear to be purely a tax planning strategy, in which case managers would impair *larger* amounts of goodwill in Luxembourg to maximize tax benefits. Instead it appears that by reducing the cost of impairments, tax deductions encourage more timely reporting of impairments. This also suggests that our results are not driven by firms with Luxembourg subsidiaries making worse acquisitions. If these firms made worse acquisitions overall, we would

[18] In all OLS models that use fewer observations than the original sample (i.e., all sub-samples), we re-rank our dependent variable so observations excluded from the sample do not affect results.

expect larger impairments, conditional on having an impairment.

INSERT TABLE 5 HERE

We next examine the effect of IFRS implementation on our results by splitting our sample into pre-IFRS (2003-2010) and post-IFRS (2011-2013) time periods in Table 6.[19] As discussed in Section 2.1, beginning in 2011, Luxembourg firms are eligible to use either Luxembourg GAAP or IFRS for filing statutory accounts (PwC 2015). Prior to 2011, Luxembourg GAAP was required. Luxembourg GAAP allows managers to amortize goodwill over the economic life of the goodwill, in addition to recording impairments (PwC 2013). Thus, to the extent firms use Luxembourg GAAP and choose to amortize goodwill fairly rapidly, we are less likely to find results. Viewed differently, the incentives to record an impairment increase in 2011 and later because, after IFRS adoption, no financial statement amortization occurs so only impairments generate tax benefits. Therefore, we expect stronger results in post-IFRS time period. Results, presented in Table 6, are consistent with this prediction. Although the post-IFRS sample is much smaller than the pre-IFRS sample, reducing power, we only find results in the post-IFRS period. We acknowledge that the results in the Tobit model for 2011 to 2013 (post-IFRS), in Table 6, column 4, fall just short of conventional levels of significance (*p*-value=0.114) likely due to the relatively small sample size. Overall, finding more statistically significant results in the period with relatively larger tax benefits to impairment supports our main hypothesis that firms' goodwill impairment decisions are affected by available tax deductions.

INSERT TABLE 6 HERE

4.3.2 Robustness Tests

We perform several additional tests to ensure that are results are robust to a variety of

[19] We suppress control variables in Table 6 for ease of presentation.

different scenarios. We perform four tests involving more exact matches.[20] Our main sample consists of multinational firms only, and thus is already matched on one dimension. In our additional matching tests, we first limit our main sample to only firm-years with market values of equity greater than $500 million to capture only large multinational firms. Results, presented in Table 7, are consistent with the main results presented in Table 4. Statistical significance of results improves in this subsample, likely as a result of a tighter sample where our hypothesized effect is more likely to exist. Large multinational firms are likely most able to utilize Luxembourg tax planning strategies due to their sophistication and resources.

INSERT TABLE 7 HERE

Second, we limit our sample to only firms with subsidiaries in Belgium, the Netherlands, and Luxembourg (typically referred to as Benelux). These countries are very similar with a long-standing economic union. Thus, firms operating in any of these countries likely do so for similar reasons and are likely similar on many dimensions. Therefore, continuing to find results on our Luxembourg indicator in a sample of Benelux firms strongly supports taxes driving our results. Results in Table 8 are largely consistent with our main results, even among only firms with subsidiaries in Benelux countries. We note, however, that the logit and OLS models fall just short of statistical significance likely due to the smaller sample size. Third, we further tighten our matched sample by combining the first two matching tests and examining only large firms operating in Benelux countries. Table 9 presents results consistent with our main tests in this

[20] Exact matching methods are generally preferred over other matching methods, such as propensity score matching (e.g., King, Nielsen, Coberley, Pope, and Wells 2011; Shipman, Swanquist, and Whited 2016). We also perform propensity score matching, and find results consistent with our main results, but more statistically significant. Although our results are robust to propensity score matching, given known issues with propensity score matching (e.g. King et al. 2011; DeFond et al. 2016; King and Nielsen 2016), we give little weight to the propensity score matching results. Specifically, propensity score matching generally results in random matches which are highly sensitive to minor design choices, increasing bias in coefficient estimates. We also note that the only advantage that propensity score matching has over multiple regression is in addressing functional form misspecification (Shipman et al. 2016).

subsample. We note that statistical significance is stronger in this test than in the sample of all firms with Benelux subsidiaries. Fourth, our next test discussed below examines only firms listed on the S&P 500, providing another alternative match. Most of these matching analyses also address the well-known concern that inclusion of small firms can bias results (e.g., Bamber, Christensen, and Gaver 2000; Givoly, Hayn, and Lourie 2016).

INSERT TABLE 8 HERE

INSERT TABLE 9 HERE

We next investigate the affect that permanently reinvested earnings (PRE) have on our results. Edwards, Kravet, and Wilson (2016) suggest that firms with higher balances of permanently reinvested earnings (PRE) make acquisitions that result in lower market reactions and are less profitable over time. Finance literature (Schurman 1999; Hietala, Kaplan, and Robinson 2002) suggests that lower market reactions can indicate overpayments in acquisitions. Firms with Luxembourg subsidiaries may have higher PRE and make poorer acquisitions, requiring more goodwill impairments. Thus, our results could be driven by high-PRE firms with Luxembourg subsidiaries making worse acquisitions and therefore requiring more impairments. To investigate this possibility, we hand collect PRE data for firms on the S&P 500 at any point between 2003 and 2013, following Ayers, Schwab, and Utke (2015). For more recent years, we obtain some PRE data from Audit Analytics instead of through hand collection. This test provides an additional robustness test of our results in multinational S&P 500 firms, where use of Luxembourg subsidiaries is more common. This test captures 96.8% of possible S&P 500 firms in our sample, with PRE data unavailable for the remaining 3.2%.

We divide our sample of S&P 500 firms into low and high PRE firms based on the

annual median PRE and repeat our prior analyses (untabulated).[21] The tenor of the results are generally consistent with our main results, although *LUX* falls just short of statistical significance in some tests using these smaller split samples. Most importantly, however, we find no difference across the coefficients of the high versus low PRE groups in any of the models (*p*-values>0.47, untabulated), indicating that worse acquisitions by Luxembourg firms are unlikely to drive our results. We also estimate the models in the full sample of S&P 500 firms, without splitting on PRE, and verify that main results are robust to this specification (*LUX* *p*-values<0.05).

We also perform several falsification tests to verify that results are driven by Luxembourg's tax deduction specifically related to goodwill impairments. To address concerns that our Luxembourg variable proxies for some aspect of tax havens or European countries unrelated to Luxembourg's rule allowing tax deductions for goodwill impairments, we replace *LUX* with an indicator variable set equal to one when firms without Luxembourg subsidiaries have subsidiaries in a) non-Luxembourg tax havens, b) Germany, or c) the U.K. Because none of these other countries allow tax deductions for goodwill impairments, we expect no results on indicators for firms with subsidiaries in these countries. We examine non-Luxembourg tax havens to ensure our results are not an artifact of tax-haven usage itself. We examine Germany because Luxembourg and Germany are close geographically and shared similar tax policy in the past (e.g., Bergin 2013). We also note that the Benelux tests above are similar to these tests in

[21] We split our sample instead of interacting PRE with *LUX* because of disagreement in interpretations of interactions in non-linear (e.g., logit and Tobit) models. Several papers suggest interactions a) must be interpreted using alternative marginal effects calculations and significance tests (e.g., Ai and Norton 2003; Norton, Wang, and Ai 2004; Powers 2005; Drichoutis 2011; Karaca-Mandic, Norton, and Dowd 2012), b) can be interpreted based on the coefficients as is typical in empirical studies (Kolasinski and Siegel 2010), or c) cannot be interpreted using marginal effects or coefficients and must use an alternative, non-numerical approach (e.g., Greene 2010). We avoid these issues by splitting the sample and testing coefficients across the groups.

that the Benelux tests examine the effects of a Luxembourg subsidiary above any effects of a Belgium or Netherlands subsidiary. We select the U.K. to examine a European country not immediately proximate to Luxembourg. Table 10 presents the results. Panel A reports the logit model, Panel B reports the Tobit model, and Panel C reports the OLS model. We find no significant results on any of the three alternative location indicator variables in any specification. This suggests that our findings relate specifically to the tax characteristics of Luxembourg.

In sum, results are robust to a multitude of additional analyses and matching techniques. This suggests that the tax deductibility of goodwill impairments in Luxembourg (i.e., taxpayer favorable book-tax conformity) drives the increase in goodwill impairments we find for firms with Luxembourg subsidiaries.

INSERT TABLE 10 HERE

V. CONCLUSION

In this paper, we examine the effect of a tax deduction for goodwill impairments on the financial accounting for those impairments. We find that firms allowed tax deductions for goodwill impairments are more likely to record goodwill impairments and record larger goodwill impairments, on average. These results are robust to alternative methodologies, explanations, and falsification tests.

This study make several contributions. First, we add to the literature on determinants of goodwill impairments, as well as the literature on the relation between book and tax accounting. In contrast to recent literature that suggests that managers focus on GAAP numbers over cash tax savings, we find that managers are more willing to record goodwill impairments, a financial reporting expense, when they get tax deductions for that expense. We also add to the literature on book-tax conformity. While most prior literature suggest that increased conformity has negative

consequences, we find that allowing tax deductibility of goodwill impairments increases the likelihood of recording an impairment, which is generally viewed as higher quality accounting. This difference from prior literature could be related to the fact that we examine a taxpayer *favorable* case of book-tax conformity. This insight represents an advantage to examining a specific tax policy, as opposed to aggregate book-tax conformity measures.

Further, we add to the literature by examining a specific tax planning strategy available to firms. In general, we know little about how firms actually avoid taxes. This study suggests that firms use special tax deductions afforded to them in certain countries to lower their tax bills. Finally, this study has policy implications. We find that factors in addition to tax rates – in our case, a special deduction for goodwill impairments – have a role in tax competition for business. Thus, the availability of these types of special deductions are important as countries try to address base erosion and profit shifting issues.

APPENDIX A
Variable Definitions

Variable	Definition
$IMPAIR_{i,t+1}$	equals *IMPAIR_DUM*, *IMPAIR_PCT*, or *IMPAIR_PCT_RANK*.
$IMPAIR\_DUM_{i,t+1}$	is an indicator variable that equals one if firm *i* recorded a goodwill impairment (GDWLIA<0) in year *t+1* and zero otherwise. If Compustat is missing GDWLIA, we set it equal to zero.
$IMPAIR\_PCT_{i,t+1}$	equals the goodwill impairment times negative one scaled by assets ([GDWLIA*-1]/AT) for firm *i* in year *t+1*.
$IMPAIR\_PCT\_RANK_{i,t+1}$	equals the rank of firm *i*'s $IMPAIR\_PCT_{i,t+1}$ relative to all other firms in year *t+1*.
$LUX_{i,t}$	is an indicator variable that equals one if firm *i* has a Luxembourg subsidiary (Scott Dyreng's Exhibit 21 Database) in year *t* and zero otherwise
$ROA_{i,t}$	equals firm *i*'s income (IB) scaled by average assets ([AT_{t-1}+AT]/2) in year *t*.
$12\_MONTH\_RET_{i,t}$	equals firm *i*'s buy and hold daily return (CRSP RET) over the firm's 12 month fiscal year *t*. We require firms have at least 200 trading days in year *t*.
$STD\_RET_{i,t}$	equals the standard deviation of firm *i*'s daily returns (CRSP RET) over the firm's 12 month fiscal year *t*. We require firms have at least 200 trading days in year *t*.
$SPECIALIST_{i,t}$	is an indicator variable that equals one if firm *i*'s auditor is an industry specialist in year *t*, where a specialist is an auditor with more than 30% of a two-digit SIC's (SICH) share of sales (SALE), and zero otherwise.
$MTB_{i,t}$	equals firm *i*'s market value of equity scaled by book value of equity ([PRCC_F*CSHO]/CEQ) at the end of year *t*.
$GW\_PCT_{i,t}$	equals firm *i*'s goodwill scaled total assets (GDWL/AT) at the end of year *t*.
$SIZE_{i,t}$	equals the natural logarithm of firm *i*'s market value of equity (PRCC_F*CSHO) at the end of year *t*.
$LEV_{i,t}$	equals firm *i*'s total liabilities scaled by assets (LT/AT) at the end of year *t*.
$LOSS_{i,t}$	is an indicator variable that equals one if firm *i*'s net income (NI) is less than zero in year *t*, and zero otherwise.
$BIGN_{i,t}$	is an indicator variable that equals one if firm *i*'s auditor (AU) in year *t* is Deloitte, Ernst & Young, KPMG, or PricewaterhouseCoopers, and zero otherwise.
$SALES\_CHG_{i,t}$	equals firm *i*'s sales in year *t* divided by sales in year *t-1* minus 1 ([SALE/$SALE_{t-1}$]-1).
$LN\_SEGMENTS_{i,t}$	equals the natural logarithm of the number of firm *i*'s business segments (BUSSEG) in year *t*.
$RECENT\_ACQ_{i,t}$	equals the sum of firm *i*'s acquisitions in years *t-2* to *t* scaled by assets ($\frac{\sum_{t-2}^{t} ACQ}{AT}$).

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TABLE 1
Sample Selection

Data Restrictions	**N**
Compustat multinational firm-year observations for all firms reporting positive total assets and positive goodwill from 2003-2013	22,511
Less:	
Firm-years missing CRSP data required for regressions	(3,782)
Firm-years missing from Exhibit 21 data	(2,711)
Firm-years missing Compustat data required for regressions	(2,694)
Firms-years with data errors in goodwill impairments (positive impairments)	(34)
Full Sample	13,290

TABLE 2

Descriptive Statistics

	Firms with Luxembourg Subsidiaries (N= 2,242)						Firms without Luxembourg Subsidiaries (N= 11,048)						
Variable	**Mean**	**StdDev**	**Q1**	**Median**	**Q3**	**Pred.**	**Mean**		**StdDev**	**Q1**	**Median**		**Q3**
IMPAIR_DUM	0.1436	0.3508	0.0000	0.0000	0.0000	>	0.1323	*	0.3389	0.0000	0.0000	*	0.0000
IMPAIR_PCT	0.0053	0.0235	0.0000	0.0000	0.0000	>	0.0074	***	0.0299	0.0000	0.0000		0.0000
IMPAIR_PCT_RANK	1,685.71	569.01	1,385.00	1,449.50	1,620.00	>	1,700.84		557.80	1,385.00	1,452.00	***	1,659.00
ROA	0.0503	0.0818	0.0210	0.0528	0.0888		0.0244	***	0.1297	-0.0003	0.0443	***	0.0844
12_MONTH_RET	0.1837	0.4628	-0.0727	0.1513	0.3719		0.2026	*	0.5987	-0.1508	0.1205	**	0.4267
STD_RET	0.0235	0.0121	0.0157	0.0202	0.0278		0.0298	***	0.0149	0.0198	0.0264	***	0.0359
SPECIALIST	0.4103	0.4920	0.0000	0.0000	1.0000		0.2838	***	0.4508	0.0000	0.0000	***	1.0000
MTB	3.1915	3.8408	1.5388	2.3371	3.6833		2.8271	***	3.7964	1.3537	2.1106	***	3.4391
GW_PCT	0.2022	0.1425	0.0869	0.1838	0.2963		0.1663	***	0.1451	0.0477	0.1250	***	0.2526
SIZE	8.3919	1.5084	7.4449	8.3530	9.4744		6.6658	***	1.7576	5.5272	6.6338	***	7.7925
LEV	0.5641	0.2099	0.4300	0.5641	0.7007		0.4797	***	0.2402	0.2971	0.4641	***	0.6243
LOSS	0.1414	0.3485	0.0000	0.0000	0.0000		0.2533	***	0.4349	0.0000	0.0000	***	1.0000
BIGN	0.9701	0.1703	1.0000	1.0000	1.0000		0.8360	***	0.3703	1.0000	1.0000	***	1.0000
CHG_SALE	0.0985	0.2666	-0.0020	0.0740	0.1634		0.1326	***	0.3523	-0.0037	0.0876	***	0.2014
LN_SEGMENTS	2.0404	0.7125	1.0986	2.1972	2.6391		1.7755	***	0.7031	1.0986	1.7918	***	2.3979
REC_ACQ	0.0914	0.1193	0.0067	0.0488	0.1309		0.0923		0.1342	0.0002	0.0396	***	0.1403

***, **, * indicate significant differences in means or medians between parents and control firms at the one percent, five percent, or ten percent level, respectively. Continuous variables are winsorized at 1% and 99%. When predictions are made, *p*-values are one-tailed. See Appendix A for variable definitions.

Table 3
Correlation Table

Variable		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1)	*IMPAIR_DUM*	1.000	**0.623**	**0.963**	0.012	**-0.104**	**-0.135**	**0.059**	**0.028**	**-0.095**	**0.071**	**-0.061**	**0.030**	**0.099**	**-0.018**	**-0.027**	**0.057**	**0.035**
(2)	*IMPAIR_PCT*	**0.997**	1.000	**0.649**	**-0.028**	**-0.131**	**-0.142**	**0.087**	0.007	**-0.082**	**0.153**	**-0.126**	**-0.033**	**0.122**	**-0.045**	-0.011	**-0.028**	**0.061**
(3)	*IMPAIR_PCT_RANK*	**0.592**	**0.592**	1.000	-0.010	**-0.118**	**-0.109**	**0.066**	**0.036**	**-0.093**	**0.077**	**-0.088**	0.016	**0.112**	0.000	**-0.017**	**0.048**	**0.032**
(4)	*LUX*	0.012	0.008	**-0.052**	1.000	**0.079**	-0.012	**-0.163**	**0.103**	**0.036**	**0.093**	**0.352**	**0.133**	**-0.099**	**0.144**	**-0.038**	**0.139**	-0.003
(5)	*ROA*	**-0.141**	**-0.146**	**-0.138**	**0.070**	1.000	**0.156**	**-0.394**	**0.056**	**0.103**	-0.009	**0.372**	**-0.146**	**-0.670**	**0.124**	**0.041**	**0.084**	**-0.027**
(6)	*12_MONTH_RET*	**-0.164**	**-0.172**	**-0.029**	**0.019**	**0.206**	1.000	-0.016	0.017	**0.183**	**-0.049**	**0.112**	0.004	**-0.125**	**0.023**	**0.070**	0.001	**-0.045**
(7)	*STD_RET*	**0.064**	**0.072**	**0.081**	**-0.204**	**-0.353**	**-0.201**	1.000	**-0.098**	**-0.099**	**-0.096**	**-0.531**	**0.063**	**0.406**	**-0.223**	0.000	**-0.147**	0.004
(8)	*SPECIALIST*	**0.028**	**0.027**	**0.040**	**0.103**	**0.056**	**0.025**	**-0.110**	1.000	**0.024**	**-0.038**	**0.164**	**0.038**	**-0.065**	**0.263**	-0.007	**0.066**	-0.007
(9)	*MTB*	**-0.188**	**-0.194**	**-0.099**	**0.055**	**0.394**	**0.350**	**-0.230**	**0.043**	1.000	**-0.033**	**0.192**	**0.024**	**-0.074**	**0.068**	**0.087**	**-0.084**	-0.003
(10)	*GW_PCT*	**0.076**	**0.086**	**0.047**	**0.108**	-0.008	**-0.027**	**-0.108**	**-0.025**	**0.031**	1.000	**0.088**	**-0.025**	**-0.018**	**0.049**	**0.025**	**0.027**	**0.358**
(11)	*SIZE*	**-0.064**	**-0.074**	**-0.110**	**0.356**	**0.388**	**0.203**	**-0.562**	**0.161**	**0.373**	**0.098**	1.000	**0.125**	**-0.364**	**0.426**	0.013	**0.239**	**-0.038**
(12)	*LEV*	**0.036**	**0.030**	-0.007	**0.155**	**-0.202**	-0.006	**-0.068**	**0.044**	0.014	0.001	**0.179**	1.000	**0.089**	**0.120**	**-0.048**	**0.201**	**-0.023**
(13)	*LOSS*	**0.099**	**0.105**	**0.099**	**-0.099**	**-0.724**	**-0.208**	**0.389**	**-0.065**	**-0.189**	**-0.017**	**-0.363**	**0.065**	1.000	**-0.130**	**-0.064**	**-0.118**	**0.026**
(14)	*BIGN*	**-0.018**	**-0.021**	**0.049**	**0.144**	**0.103**	**0.059**	**-0.226**	**0.263**	**0.124**	**0.058**	**0.413**	**0.132**	**-0.130**	1.000	**-0.022**	**0.108**	0.003
(15)	*SALES_CHG*	**-0.066**	**-0.067**	**-0.038**	**-0.036**	**0.249**	**0.135**	**-0.053**	0.010	**0.243**	**0.040**	**0.088**	**-0.105**	**-0.198**	0.007	1.000	**-0.050**	**0.112**
(16)	*LN_SEGMENTS*	**0.059**	**0.052**	**0.022**	**0.145**	**0.045**	**0.030**	**-0.200**	**0.071**	**-0.091**	**0.041**	**0.252**	**0.229**	**-0.122**	**0.113**	**-0.063**	1.000	0.003
(17)	*REC_ACQ*	**0.041**	**0.044**	0.013	**0.033**	**0.018**	**-0.038**	**-0.054**	0.001	0.011	**0.394**	**0.017**	**-0.064**	**-0.033**	**0.039**	**0.154**	**0.034**	1.000

Pearson (Spearman) correlations are above (below) the diagonal. **Bolded** correlations are significant at the 0.05 level. Variables are defined in Appendix A.

TABLE 4
Luxembourg Subsidiaries and the Likelihood and Size of Goodwill Impairments

$$IMPAIR_{i,t+1} = \beta_0 + \beta_1 LUX_{i,t} + \beta_2 ROA_{i,t} + \beta_3 12\_MONTH\_RET_{i,t} + \beta_4 STD\_RET_{i,t} + \beta_5 SPECIALIST_{i,t} + \beta_6 MTB_{i,t} + \beta_7 GW\_PCT_{i,t} + \beta_8 SIZE_{i,t} + \beta_9 LEV_{i,t} + \beta_{10} LOSS_{i,t} + \beta_{11} BIGN_{i,t} + \beta_{12} SALES\_CHG_{i,t} + \beta_{13} LN\_SEGMENTS_{i,t} + \beta_{14} RECENT\_ACQ_{i,t} + \beta_{15} YEAR\_FE_t + \beta_{16} IND\_FE_i + \varepsilon$$

		(1)			(2)		(3)	
Method		Logit			Tobit		OLS	
Dependent Variable		*IMPAIR_DUM*			*IMPAIR_PCT*		*IMPAIR_PCT_RANK*	
		Coefficient		dy/dx	Coefficient		Coefficient	
Variable	**Pred.**	***(p-value)***			***(p-value)***		***(p-value)***	
Intercept	?	-1.2604	**		-0.1276	***	608.4789	***
		(0.0103)			***(0.0010)***		***(<0.0001)***	
LUX	+	0.1341	*	0.0133	0.0066	*	10.5863	**
		(0.0785)			***(0.0680)***		***(0.0467)***	
ROA	-	-1.2099	***	-0.0143	-0.0732	***	-80.5165	***
		(0.0000)			***(<0.0001)***		***(0.0004)***	
12_MONTH_RET	-	-0.5646	***	-0.0313	-0.0296	***	-30.1594	***
		(<0.0001)			***(<0.0001)***		***(<0.0001)***	
STD_RET	+	4.9655	**	0.0070	0.3369	***	533.7789	***
		(0.0410)			***(0.0090)***		***(0.0049)***	
SPECIALIST	+	0.1890	***	0.0187	0.0121	***	14.4916	***
		(0.0051)			***(0.0005)***		***(0.0017)***	
MTB	-	-0.0636	***	-0.0232	-0.0031	***	-2.7854	***
		(<0.0001)			***(<0.0001)***		***(<0.0001)***	
GW_PCT	+	1.6307	***	0.0228	0.1518	***	138.8882	***
		(<0.0001)			***(<0.0001)***		***(<0.0001)***	
SIZE	?	-0.0399		-0.0070	-0.0052	***	-5.1962	***
		(0.1380)			***(<0.0001)***		***(0.0022)***	
LEV	?	-0.3835	**	-0.0087	-0.0191	**	-16.1200	*
		(0.0127)			***(0.0110)***		***(0.0876)***	
LOSS	+	0.2884	***	0.0295	0.0143	***	23.5776	***
		(0.0006)			***(0.0010)***		***(0.0003)***	
BIGN	+	0.0599		0.0058	0.0028		5.3759	
		(0.2908)			***(0.3045)***		***(0.2359)***	
SALES_CHG	-	-0.0796		-0.0026	-0.0046		-5.6337	
		(0.1757)			***(0.1400)***		***(0.1589)***	
LN_SEGMENTS	?	0.2923	***	0.0199	0.0106	***	16.8263	***
		(<0.0001)			***(<0.0001)***		***(<0.0001)***	
RECENT_ACQ	?	0.0957		0.0012	-0.0008		5.3235	
		(0.6900)			***(0.9520)***		***(0.7741)***	
Year FE?		Yes			Yes		Yes	
Industry FE?		Yes			Yes		Yes	
N		13,290			13,290		13,290	
R^2		n/a			n/a		6.1%	
Pseudo-R^2		7.7%			39.1%		n/a	
% Correctly Predicted		72.2%			n/a		n/a	
Area under the ROC curve		72.5%			n/a		n/a	

***, **, * indicate significance at the one percent, five percent, and ten percent levels, respectively. Huber-White robust standard errors are clustered by firm and are used to control for heteroscedasticity and serial correlation. When predictions are made, *p*-values are one-tailed. Marginal effects (dy/dx) reflect the effect of a one standard deviation change across the mean of the variable (or 0 to 1 for indicator variables), from 1/2 standard deviation below the mean to 1/2 standard deviation above the mean, with all other variables held at their means. Variables are defined in Appendix A.

TABLE 5
Luxembourg Subsidiaries and the Size of Goodwill Impairments - Firms with Non-zero Goodwill Impairments

$$IMPAIR_{i,t+1} = \beta_0 + \beta_1 LUX_{i,t} + \beta_2 ROA_{i,t} + \beta_3 12\_MONTH\_RET_{i,t} + \beta_4 STD\_RET_{i,t} + \beta_5 SPECIALIST_{i,t} + \beta_6 MTB_{i,t} + \beta_7 GW\_PCT_{i,t} + \beta_8 SIZE_{i,t} + \beta_9 LEV_{i,t} + \beta_{10} LOSS_{i,t} + \beta_{11} BIGN_{i,t} + \beta_{12} SALES\_CHG_{i,t} + \beta_{13} LN\_SEGMENTS_{i,t} + \beta_{14} RECENT\_ACQ_{i,t} + \beta_{15} YEAR\_FE_t + \beta_{16} IND\_FE_i + \varepsilon$$

		(1)		(2)	
Method		Tobit		OLS	
Dependent Variable		*IMPAIR_PCT*		*IMPAIR_PCT_RANK*	
Variable	**Pred.**	Coefficient ***(p-value)***		Coefficient ***(p-value)***	
Intercept	?	0.1172	***	2897.2135	***
		(<0.0001)		***(<0.0001)***	
LUX	+	-0.0420		2.4831	
		(0.2985)		***(0.3748)***	
ROA	-	-0.0119	***	-42.6027	**
		(0.0005)		***(0.0288)***	
12_MONTH_RET	-	0.3505	***	-15.3364	***
		(<0.0001)		***(0.0005)***	
STD_RET	+	0.0034	***	386.4049	**
		(0.0010)		***(0.0239)***	
SPECIALIST	+	0.0000		6.2328	
		(0.1115)		***(0.1603)***	
MTB	-	0.1864		1.0609	*
		(0.4825)		***(0.0855)***	
GW_PCT	+	-0.0069	***	303.6747	***
		(<0.0001)		***(<0.0001)***	
SIZE	?	-0.0237	***	-15.6087	***
		(<0.0001)		***(<0.0001)***	
LEV	?	0.0021	***	-56.4080	***
		(<0.0001)		***(0.0000)***	
LOSS	+	0.0010		8.6768	
		(0.2670)		***(0.1065)***	
BIGN	+	0.0000		6.7013	
		(0.4120)		***(0.2369)***	
SALES_CHG	-	-0.0094		-11.2940	***
		(0.4580)		***(0.0038)***	
LN_SEGMENTS	?	-0.0097	***	-0.5640	
		(<0.0001)		***(0.9729)***	
RECENT_ACQ	?	0.0051		634.1312	***
		(0.3000)		***(<0.0001)***	
Year FE?		Yes		Yes	
Industry FE?		Yes		Yes	
N		1,784		1,784	
R^2		n/a		82.6%	
Pseudo-R^2		-20.7%		n/a	

***, **, * indicate significance at the one percent, five percent, and ten percent levels, respectively. Huber-White robust standard errors are clustered by firm and are used to control for heteroscedasticity and serial correlation. When predictions are made, *p*-values are one-tailed. Variables are defined in Appendix A.

TABLE 6
Luxembourg Subsidiaries and the Likelihood and Size of Goodwill Impairments - Pre-IFRS (2003-2010) and Post-IFRS (2011-2013)

$$IMPAIR_{i,t+1} = \beta_0 + \beta_1 LUX_{i,t} + \beta_2 ROA_{i,t} + \beta_3 12\_MONTH\_RET_{i,t} + \beta_4 STD\_RET_{i,t} + \beta_5 SPECIALIST_{i,t} + \beta_6 MTB_{i,t} + \beta_7 GW\_PCT_{i,t} + \beta_8 SIZE_{i,t} + \beta_9 LEV_{i,t} + \beta_{10} LOSS_{i,t} + \beta_{11} BIGN_{i,t} + \beta_{12} SALES\_CHG_{i,t} + \beta_{13} LN\_SEGMENTS_{i,t} + \beta_{14} RECENT\_ACQ_{i,t} + \beta_{15} YEAR\_FE_t + \beta_{16} IND\_FE_i + \varepsilon$$

Method		Logit		Tobit		OLS	
Dependent Variable		*IMPAIR_DUM*		*IMPAIR_PCT*		*IMPAIR_PCT_RANK*	
		(1)	(2)	(3)	(4)	(5)	(6)
Time Period		2003-2010	2011-2013	2003-2010	2011-2013	2003-2010	2011-2013
		Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
Variable	**Pred.**	***(p-value)***	***(p-value)***	***(p-value)***	***(p-value)***	***(p-value)***	***(p-value)***
LUX	+	0.0841	0.2333 *	0.0049	0.0069	7.2919	14.7175 *
		(0.2303)	***(0.0580)***	***(0.1930)***	***(0.1135)***	***(0.1656)***	***(0.0702)***
Year FE?		Yes	Yes	Yes	Yes	Yes	Yes
Industry FE?		Yes	Yes	Yes	Yes	Yes	Yes
N		9,591	3,699	9,591	3,669	9,591	3,699
R^2		n/a	n/a	n/a	n/a	6.5%	5.3%
Pseudo-R^2		9.2%	5.0%	41.8%	39.8%	n/a	n/a
% Correctly Predicted		74.2%	68.2%	n/a	n/a	n/a	n/a
Area under the ROC curve		74.5%	68.6%	n/a	n/a	n/a	n/a

***, **, * indicate significance at the one percent, five percent, and ten percent levels, respectively. Huber-White robust standard errors are clustered by firm and are used to control for heteroscedasticity and serial correlation. When predictions are made, *p*-values are one-tailed. Variables are defined in Appendix A.

TABLE 7
Likelihood and Size of Goodwill Impairments for Firms with Market Value of Equity > $500 Million

$$IMPAIR_{i,t+1} = \beta_0 + \beta_1 LUX_{i,t} + \beta_2 ROA_{i,t} + \beta_3 12\_MONTH\_RET_{i,t} + \beta_4 STD\_RET_{i,t} + \beta_5 SPECIALIST_{i,t} + \beta_6 MTB_{i,t} + \beta_7 GW\_PCT_{i,t} + \beta_8 SIZE_{i,t} + \beta_9 LEV_{i,t} + \beta_{10} LOSS_{i,t} + \beta_{11} BIGN_{i,t} + \beta_{12} SALES\_CHG_{i,t} + \beta_{13} LN\_SEGMENTS_{i,t} + \beta_{14} RECENT\_ACQ_{i,t} + \beta_{15} YEAR\_FE_t + \beta_{16} IND\_FE_i + \varepsilon$$

		(1)		(2)		(3)	
Method		Logit		Tobit		OLS	
Dependent Variable		*IMPAIR_DUM*		*IMPAIR_PCT*		*IMPAIR_PCT_RANK*	
Variable	**Pred.**	Coefficient ***(p-value)***		Coefficient ***(p-value)***		Coefficient ***(p-value)***	
Intercept	?	-0.0810		-0.1202	***	460.6981	***
		(0.8938)		***(0.0010)***		***(<0.0001)***	
LUX	+	0.1770	**	0.0064	**	8.4412	**
		(0.0407)		***(0.0485)***		***(0.0259)***	
ROA	-	-2.9228	***	-0.1206	***	-106.5300	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
12_MONTH_RET	-	-0.5585	***	-0.0237	***	-19.7543	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
STD_RET	+	12.3632	***	0.6815	***	652.3217	***
		(0.0060)		***(0.0005)***		***(0.0009)***	
SPECIALIST	+	0.3392	***	0.0142	***	12.4792	***
		(0.0001)		***(<0.0001)***		***(0.0003)***	
MTB	-	-0.0596	***	-0.0023	***	-1.5933	***
		(0.0000)		***(<0.0001)***		***(0.0000)***	
GW_PCT	+	2.0044	***	0.1385	***	98.5600	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
SIZE	?	-0.0191		-0.0026		-1.2663	
		(0.6478)		***(0.1070)***		***(0.4018)***	
LEV	?	-0.0782		-0.0048		2.0196	
		(0.7308)		***(0.5720)***		***(0.8017)***	
LOSS	+	0.1178		0.0052		11.0675	**
		(0.1974)		***(0.1830)***		***(0.0457)***	
BIGN	+	-0.3477	**	-0.0150	**	-13.0943	*
		(0.0486)		***(0.0370)***		***(0.0762)***	
SALES_CHG	-	-0.0643		-0.0003		-0.4611	
		(0.3125)		***(0.4790)***		***(0.4657)***	
LN_SEGMENTS	?	0.2874	***	0.0081	***	8.9899	***
		(0.0001)		***(0.0020)***		***(0.0007)***	
RECENT_ACQ	?	-0.7350	**	-0.0463	***	-36.9671	**
		(0.0376)		***(0.0020)***		***(0.0107)***	
Year FE?		Yes		Yes		Yes	
Industry FE?		Yes		Yes		Yes	
N		8,766		8,766		8,766	
R^2		n/a		n/a		13.1%	
Pseudo-R^2		7.1%		45.2%		n/a	
% Correctly Predicted		72.5%		n/a		n/a	
Area under the ROC curve		72.9%		n/a		n/a	

***, **, * indicate significance at the one percent, five percent, and ten percent levels, respectively. Huber-White robust standard errors are clustered by firm and are used to control for heteroscedasticity and serial correlation. When predictions are made, p-values are one-tailed. Variables are defined in Appendix A.

TABLE 8
Likelihood and Size of Goodwill Impairments for Firms with Benelux Subsidiaries

$$IMPAIR_{i,t+1} = \beta_0 + \beta_1 LUX_{i,t} + \beta_2 ROA_{i,t} + \beta_3 12\_MONTH\_RET_{i,t} + \beta_4 STD\_RET_{i,t} + \beta_5 SPECIALIST_{i,t} + \beta_6 MTB_{i,t} + \beta_7 GW\_PCT_{i,t} + \beta_8 SIZE_{i,t} + \beta_9 LEV_{i,t} + \beta_{10} LOSS_{i,t} + \beta_{11} BIGN_{i,t} + \beta_{12} SALES\_CHG_{i,t} + \beta_{13} LN\_SEGMENTS_{i,t} + \beta_{14} RECENT\_ACQ_{i,t} + \beta_{15} YEAR\_FE_t + \beta_{16} IND\_FE_i + \varepsilon$$

		(1)		(2)		(3)	
Method		Logit		Tobit		OLS	
Dependent Variable		*IMPAIR_DUM*		*IMPAIR_PCT*		*IMPAIR_PCT_RANK*	
		Coefficient		Coefficient		Coefficient	
Variable	**Pred.**	***(p-value)***		***(p-value)***		***(p-value)***	
Intercept	?	0.0887		-0.0899	***	274.9614	***
		(0.8652)		***(0.0080)***		***(<0.0001)***	
LUX	+	0.1279		0.0059	*	4.0687	
		(0.1133)		***(0.0875)***		***(0.1001)***	
ROA	-	-2.5178	***	-0.1065	***	-70.4881	***
		(<0.0001)		***(<0.0001)***		***(0.0001)***	
12_MONTH_RET	-	-0.6252	***	-0.0268	***	-14.5975	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
STD_RET	+	3.1758		0.1793		149.5494	
		(0.2609)		***(0.1980)***		***(0.1754)***	
SPECIALIST	+	0.2197	**	0.0137	***	6.9752	**
		(0.0187)		***(0.0015)***		***(0.0150)***	
MTB	-	-0.0602	***	-0.0027	***	-1.2552	***
		(0.0004)		***(0.0005)***		***(0.0001)***	
GW_PCT	+	1.6458	***	0.1224	***	56.8237	***
		(<0.0001)		***(<0.0001)***		***(0.0000)***	
SIZE	?	-0.0285		-0.0043	***	-2.1535	*
		(0.4803)		***(0.0100)***		***(0.0539)***	
LEV	?	-0.1485		-0.0039		1.1791	
		(0.5436)		***(0.6990)***		***(0.8581)***	
LOSS	+	0.3136	**	0.0156	***	13.8440	***
		(0.0139)		***(0.0070)***		***(0.0032)***	
BIGN	+	0.0145		0.0011		4.7364	
		(0.4712)		***(0.4510)***		***(0.2197)***	
SALES_CHG	-	0.1015		0.0008		0.8125	
		(0.2299)		***(0.4535)***		***(0.4287)***	
LN_SEGMENTS	?	0.2823	***	0.0080	**	7.1799	***
		(0.0005)		***(0.0120)***		***(0.0010)***	
RECENT_ACQ	?	-0.2875		-0.0181		-11.5861	
		(0.5278)		***(0.4130)***		***(0.4179)***	
Year FE?		Yes		Yes		Yes	
Industry FE?		Yes		Yes		Yes	
N		6,076		6,076		6,076	
R^2		n/a		n/a		8.7%	
Pseudo-R^2		8.5%		49.4%		n/a	
% Correctly Predicted		73.2%		n/a		n/a	
Area under the ROC curve		73.4%		n/a		n/a	

***, **, * indicate significance at the one percent, five percent, and ten percent levels, respectively. Huber-White robust standard errors are clustered by firm and are used to control for heteroscedasticity and serial correlation. When predictions are made, p-values are one-tailed. Variables are defined in Appendix A.

TABLE 9
Likelihood and Size of Goodwill Impairments for Firms with Benelux Subsidiaries and Market Value of Equity > $500 Million

$$IMPAIR_{i,t+1} = \beta_0 + \beta_1 LUX_{i,t} + \beta_2 ROA_{i,t} + \beta_3 12\_MONTH\_RET_{i,t} + \beta_4 STD\_RET_{i,t} + \beta_5 SPECIALIST_{i,t} + \beta_6 MTB_{i,t} + \beta_7 GW\_PCT_{i,t} + \beta_8 SIZE_{i,t} + \beta_9 LEV_{i,t} + \beta_{10} LOSS_{i,t} + \beta_{11} BIGN_{i,t} + \beta_{12} SALES\_CHG_{i,t} + \beta_{13} LN\_SEGMENTS_{i,t} + \beta_{14} RECENT\_ACQ_{i,t} + \beta_{15} YEAR\_FE_t + \beta_{16} IND\_FE_i + \varepsilon$$

		(1)		(2)		(3)	
Method		Logit		Tobit		OLS	
Dependent Variable		*IMPAIR_DUM*		*IMPAIR_PCT*		*IMPAIR_PCT_RANK*	
Variable	**Pred.**	Coefficient ***(p-value)***		Coefficient ***(p-value)***		Coefficient ***(p-value)***	
Intercept	?	0.3524		-0.0805	**	1501.6029	***
		(0.6579)		***(0.0290)***		***(<0.0001)***	
LUX	+	0.1512	*	0.0060	*	30.0793	*
		(0.0946)		***(0.0805)***		***(0.0554)***	
ROA	-	-4.9051	***	-0.1758	***	-735.8821	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
12_MONTH_RET	-	-0.6166	***	-0.0230	***	-81.8744	***
		(0.0000)		***(<0.0001)***		***(<0.0001)***	
STD_RET	+	4.4627		0.1857		684.8254	
		(0.2662)		***(0.2335)***		***(0.2703)***	
SPECIALIST	+	0.2635	**	0.0140	***	39.0884	**
		(0.0113)		***(0.0010)***		***(0.0198)***	
MTB	-	-0.0509	***	-0.0022	***	-6.0220	***
		(0.0051)		***(0.0015)***		***(0.0010)***	
GW_PCT	+	2.0721	***	0.1231	***	351.5226	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
SIZE	?	-0.0260		-0.0035	*	-6.5335	
		(0.6281)		***(0.0760)***		***(0.3995)***	
LEV	?	-0.1561		-0.0017		14.2248	
		(0.6011)		***(0.8740)***		***(0.7428)***	
LOSS	+	0.0303		0.0052		46.8680	
		(0.4379)		***(0.2470)***		***(0.1015)***	
BIGN	+	-0.2537		-0.0095		-10.3100	
		(0.1795)		***(0.2210)***		***(0.4165)***	
SALES_CHG	-	0.0500		0.0014		14.6433	
		(0.3872)		***(0.4275)***		***(0.3258)***	
LN_SEGMENTS	?	0.2359	**	0.0054	*	27.3198	**
		(0.0100)		***(0.0990)***		***(0.0430)***	
RECENT_ACQ	?	-0.9964	**	-0.0531	***	-203.6996	***
		(0.0349)		***(0.0060)***		***(0.0094)***	
Year FE?		Yes		Yes		Yes	
Industry FE?		Yes		Yes		Yes	
N		5,008		5,008		5,008	
R^2		n/a		n/a		10.6%	
Pseudo-R^2		8.4%		53.7%		n/a	
% Correctly Predicted		73.7%		n/a		n/a	
Area under the ROC curve		74.0%		n/a		n/a	

***, **, * indicate significance at the one percent, five percent, and ten percent levels, respectively. Huber-White robust standard errors are clustered by firm and are used to control for heteroscedasticity and serial correlation. When predictions are made, p-values are one-tailed. Variables are defined in Appendix A.

TABLE 10
Determinants of Goodwill Impairment

Panel A: Logit Model Examining Countries Other Than Luxembourg

$$IMPAIR_{i,t+1} = \beta_0 + \beta_1 LUX_{i,t} + \beta_2 ROA_{i,t} + \beta_3 12\_MONTH\_RET_{i,t} + \beta_4 STD\_RET_{i,t} + \beta_5 SPECIALIST_{i,t} + \beta_6 MTB_{i,t} + \beta_7 GW\_PCT_{i,t} + \beta_8 SIZE_{i,t} + \beta_9 LEV_{i,t} + \beta_{10} LOSS_{i,t} + \beta_{11} BIGN_{i,t} + \beta_{12} SALES\_CHG_{i,t} + \beta_{13} LN\_SEGMENTS_{i,t} + \beta_{14} RECENT\_ACQ_{i,t} + \beta_{15} YEAR\_FE_t + \beta_{16} IND\_FE_i + \varepsilon$$

		(1)		(2)		(3)	
Dependent Variable		*IMPAIR_DUM*		*IMPAIR_DUM*		*IMPAIR_DUM*	
***LOCATION* Variable**		*Non-Lux Haven*		*GERMANY*		*U.K.*	
		Coefficient		Coefficient		Coefficient	
Variable	**Pred.**	***(p-value)***		***(p-value)***		***(p-value)***	
Intercept	?	-1.3394	***	-1.3142	***	-1.3408	***
		(0.0066)		***(0.0077)***		***(0.0066)***	
LOCATION	+	0.0466		-0.0197		0.0413	
		(0.2406)		***(0.3960)***		***(0.2698)***	
ROA	-	-1.2297	***	-1.2250	***	-1.2327	***
		(0.0000)		***(0.0000)***		***(0.0000)***	
12_MONTH_RET	-	-0.5689	***	-0.5685	***	-0.5683	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
STD_RET	+	4.9463	**	4.9887	**	5.0224	**
		(0.0417)		***(0.0403)***		***(0.0396)***	
SPECIALIST	+	0.1949	***	0.1934	***	0.1948	***
		(0.0040)		***(0.0042)***		***(0.0040)***	
MTB	-	-0.0636	***	-0.0636	***	-0.0637	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
GW_PCT	+	1.6645	***	1.6562	***	1.6561	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
SIZE	?	-0.0305		-0.0289		-0.0293	
		(0.2622)		***(0.2864)***		***(0.2768)***	
LEV	?	-0.3653	**	-0.3681	**	-0.3687	**
		(0.0174)		***(0.0166)***		***(0.0167)***	
LOSS	+	0.2876	***	0.2899	***	0.2881	***
		(0.0006)		***(0.0006)***		***(0.0006)***	
BIGN	+	0.0509		0.0560		0.0518	
		(0.3200)		***(0.3034)***		***(0.3172)***	
SALES_CHG	-	-0.0828		-0.0837		-0.0828	
		(0.1681)		***(0.1647)***		***(0.1677)***	
LN_SEGMENTS	?	0.2943	***	0.2928	***	0.2926	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
RECENT_ACQ	?	0.0878		0.0882		0.0890	
		(0.7140)		***(0.7134)***		***(0.7103)***	
Year FE?		Yes		Yes		Yes	
Industry FE?		Yes		Yes		Yes	
N		13,290		13,290		13,290	
Pseudo-R^2		7.6%		7.6%		7.6%	
% Correctly Predicted		72.2%		72.2%		72.2%	
Area under the ROC curve		72.5%		72.5%		72.5%	

***, **, * indicate significance at the one percent, five percent, and ten percent levels, respectively. Huber-White robust standard errors are clustered by firm and are used to control for heteroscedasticity and serial correlation. When predictions are made, p-values are one-tailed. Variables are defined in Appendix A.

TABLE 10 (Cont'd)
Size of Goodwill Impairments

Panel B: Tobit Model Examining Countries Other Than Luxembourg

		(1)		(2)		(3)	
Dependent Variable		*IMPAIR_PCT*		*IMPAIR_PCT*		*IMPAIR_PCT*	
***LOCATION* Variable**		*Non-Lux Haven*		*GERMANY*		*U.K.*	
		Coefficient		Coefficient		Coefficient	
Variable	**Pred.**	***(p-value)***		***(p-value)***		***(p-value)***	
Intercept	?	-0.1319	***	-0.1312	***	-0.1315	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
LOCATION	+	0.0012		0.0000		0.0034	
		(0.3495)		***(0.4990)***		***(0.1485)***	
ROA	-	-0.0739	***	-0.0738	***	-0.0743	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
12_MONTH_RET	-	-0.0298	***	-0.0298	***	-0.0297	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
STD_RET	+	0.3366	***	0.3378	***	0.3404	***
		(0.0090)		***(0.0090)***		***(0.0085)***	
SPECIALIST	+	0.0123	***	0.0123	***	0.0123	***
		(0.0005)		***(0.0005)***		***(0.0005)***	
MTB	-	-0.0031	***	-0.0031	***	-0.0031	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
GW_PCT	+	0.1533	***	0.1531	***	0.1532	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
SIZE	?	-0.0048	***	-0.0047	***	-0.0047	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
LEV	?	-0.0180	**	-0.0181	**	-0.0182	**
		(0.0160)		***(0.0160)***		***(0.0150)***	
LOSS	+	0.0143	***	0.0143	***	0.0143	***
		(0.0010)		***(0.0010)***		***(0.0010)***	
BIGN	+	0.0024		0.0025		0.0023	
		(0.3270)		***(0.3200)***		***(0.3355)***	
SALES_CHG	-	-0.0047		-0.0047		-0.0047	
		(0.1310)		***(0.1305)***		***(0.1310)***	
LN_SEGMENTS	?	0.0107	***	0.0106	***	0.0106	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
RECENT_ACQ	?	-0.0012		-0.0012		-0.0011	
		(0.9240)		***(0.9270)***		***(0.9300)***	
Year FE?		Yes		Yes		Yes	
Industry FE?		Yes		Yes		Yes	
N		13,290		13,290		13,290	
Pseudo-R^2		39.0%		39.0%		39.0%	

***, **, * indicate significance at the one percent, five percent, and ten percent levels, respectively. Huber-White robust standard errors are clustered by firm and are used to control for heteroscedasticity and serial correlation. When predictions are made, p-values are one-tailed. Variables are defined in Appendix A.

TABLE 10 (Cont'd)
Size of Goodwill Impairments

Panel C: OLS Model Examining Countries Other Than Luxembourg

		(1)		(2)		(3)	
Dependent Variable		*IMPAIR_PCT_RANK*		*IMPAIR_PCT_RANK*		*IMPAIR_PCT_RANK*	
***LOCATION* Variable**		*Non-Lux Haven*		*GERMANY*		*U.K.*	
		Coefficient		Coefficient		Coefficient	
Variable	**Pred.**	***(p-value)***		***(p-value)***		***(p-value)***	
Intercept	?	1487.0583	***	1487.9498	***	1487.6692	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
LOCATION	+	6.1926		-0.4925		9.0410	
		(0.2959)		***(0.4844)***		***(0.2166)***	
ROA	-	-217.9780	***	-217.2706	***	-218.7369	***
		(0.0003)		***(0.0003)***		***(0.0003)***	
12_MONTH_RET	-	-81.1118	***	-81.1463	***	-80.9979	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
STD_RET	+	1406.7706	***	1414.6728	***	1425.9745	***
		(0.0060)		***(0.0058)***		***(0.0055)***	
SPECIALIST	+	39.9256	***	39.7320	***	40.0338	***
		(0.0014)		***(0.0014)***		***(0.0013)***	
MTB	-	-7.4763	***	-7.5004	***	-7.4764	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
GW_PCT	+	362.9306	***	361.8619	***	362.2881	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
SIZE	?	-10.5421	**	-10.3246	**	-10.4001	**
		(0.0229)		***(0.0253)***		***(0.0229)***	
LEV	?	-34.8606		-35.0906		-35.3722	
		(0.1694)		***(0.1678)***		***(0.1646)***	
LOSS	+	63.2574	***	63.4940	***	63.1711	***
		(0.0003)		***(0.0003)***		***(0.0003)***	
BIGN	+	10.5232		10.9615		10.3910	
		(0.2979)		***(0.2903)***		***(0.3005)***	
SALES_CHG	-	-15.8313		-15.8780		-15.7570	
		(0.1449)		***(0.1443)***		***(0.1461)***	
LN_SEGMENTS	?	46.1537	***	46.0074	***	45.9206	***
		(<0.0001)		***(<0.0001)***		***(<0.0001)***	
RECENT_ACQ	?	10.1659		10.0877		10.1339	
		(0.8354)		***(0.8367)***		***(0.8358)***	
Year FE?		Yes		Yes		Yes	
Industry FE?		Yes		Yes		Yes	
N		13,290		13,290		13,290	
R^2		9.3%		9.3%		9.3%	

***, **, * indicate significance at the one percent, five percent, and ten percent levels, respectively. Huber-White robust standard errors are clustered by firm and are used to control for heteroscedasticity and serial correlation. When predictions are made, p-values are one-tailed. Variables are defined in Appendix A.