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Managerial ability and goodwill impairment☆,☆☆

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ABSTRACT

This study examines the relationship between managerial ability and goodwill impairment. I predict a negative relationship because prior studies suggest that more-able managers better prevent or reduce goodwill impairment, relative to less-able managers. Regression analysis reveals a significant and negative relationship between managerial ability and goodwill impairment measured as the likelihood of goodwill impairment and the magnitude of goodwill impairment losses. Overall, evidence suggests that managers with greater ability play an important role in preventing or reducing goodwill impairment.

1. Introduction

In June 2001, the Financial Accounting Standards Board (FASB) issued Statement of Financial Accounting Standards No. 142 (SFAS 142), *Goodwill and Other Intangible Assets.*[1] Prior to SFAS 142, any excess of purchase price over the fair value of the acquired firm's net assets was recognized as goodwill. The value of goodwill in a purchase acquisition was then amortized over a period of up to 40 years. SFAS 142 eliminates the practice of systematic amortization of goodwill in business combinations; instead, the standard requires companies to assess goodwill for impairment annually and to recognize a loss if goodwill is impaired. Hayn and Hughes (2006) argue that the new goodwill impairment accounting practices under SFAS 142 put more responsibility on managers to determine the fair value of goodwill, suggesting that management plays an important role in the process of determining the fair value of goodwill and the magnitude of goodwill impairment losses if goodwill impairment exists.

The purpose of this study is to examine the relationship between managerial ability and goodwill impairment. This study focuses on goodwill impairment for the following reasons: First, goodwill accounts for a significant amount of a firm's balance sheet and thus it is an important corporate asset (Jennings, Robinson, Thompson, & Duvall, 1996). Second, goodwill valuation is a key input when assessing a firm's future cash flows (Hayn & Hughes, 2006). Investors extract goodwill information to form appropriate perceptions concerning a firm's intangible assets. Third, SFAS 142 requires the goodwill impairment test if there is a decline in the fair value of a reporting unit. Thus, goodwill is regarded as the most sensitive asset to a decline in firm value (Filip, Jeanjean, & Paugam, 2015). Fourth, goodwill impairment reflects managerial inability to extract value from prior acquisitions. Fifth, goodwill impairment is a leading indicator of future firm performance stemming from the failure to realize the expected benefits of prior acquisitions (Li, Shroff, Venkataraman, & Zhang, 2011). Last, the frequency of goodwill impairments has drastically increased and goodwill impairment losses have become economically significant events (Darrough, Guler, & Wang, 2014).

Demerjian, Lev, and McVay (2012) argue that more-able managers better foresee business opportunities, make better decisions, and better manage their firms to maximize shareholders' benefits, relative to less-able managers. Other studies on managerial ability document that more-able managers better smooth earnings to maximize shareholders' benefits (Demerjian, Lewis-Western, & McVay, 2015), engage in fewer tax-avoidance activities (Francis, Sun, & Wu, 2014) and fewer earnings-management activities (Demerjian, Lewis, Lev, & McVay, 2013), and better reduce audit fees (Krishnan & Wang, 2015). Taken together, the above studies suggest that managers with greater ability better manage their companies. Goodwill impairment is viewed as negative news that signals declining firm performance (Hirschey & Richardson, 2002). Hence, companies have incentives to prevent or reduce goodwill impairment losses (Li et al., 2011). Whether more-able managers can better prevent or reduce goodwill impairment losses is an interesting question that has not been examined previously. Based on prior studies, I posit that more-able managers better prevent or

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☆☆ Data Availability: Data are available from sources identified in the paper.

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[1] Under FASB Accounting Standards Update 350–20 (ASU 350–20), the annual assessment of goodwill impairment is no longer required after 12/15/2011 but rather when conditions exist that it is more likely than not that the reporting unit fair value is less than its carrying value.

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reduce goodwill impairment losses through more efficient management than less-able managers.[2]

I first identify a full sample including goodwill impairment firms and no goodwill impairment firms from 2002 to 2011. The full sample is restricted to firms that have goodwill.[3] After controlling for managers' opportunistic behavior, the regression analysis reveals a negative relationship between managerial ability and the likelihood of goodwill impairment, suggesting that more-able mangers can better prevent goodwill impairment than can less-able managers. Next, using the goodwill impairment sample firms, the regression analysis documents a negative relationship between managerial ability and the magnitude of goodwill impairment losses, suggesting that more-able managers can better reduce the magnitude of goodwill impairment losses than less-able mangers. Next, I perform various additional tests including alternative sample periods, fixed-effects regression, and two-stage OLS regression analysis (2SLS) to address potential endogeneity issues. These additional tests provide consistent results. Overall, the findings support a negative relationship between managerial ability and goodwill impairment, suggesting that managers with greater ability better prevent or reduce impairment losses. Last, I incorporate CEO tenure into the regression analysis and find that CEO tenure is negatively related to goodwill impairment losses. This finding is consistent with Beatty and Weber (2006); Ramanna and Watts (2012). Furthermore, I find that capable CEOs with longer tenure better reduce the magnitude of goodwill impairment losses.

This study makes several contributions. First, this study extends and links two distinct research streams: managerial ability studies in management and goodwill literature in accounting. Specifically, this study extends literature on the impact of managerial ability on various firm characteristics and contributes to research regarding the determinants of goodwill impairment, a major research stream in goodwill accounting (Li & Sloan, 2015). To the best of my knowledge, this is the first study that performs a direct empirical test on the relationship between managerial ability and goodwill impairment. Second, this study contributes to the literature on goodwill impairment prediction models (e.g., Hayn & Hughes, 2006) by examining managerial ability and the likelihood of goodwill impairment. Although this study does not attempt to construct a prediction model for goodwill impairment, the findings from this study may provide an avenue for future research on goodwill impairment. The inclusion of managerial ability may help users of financial statements better assess the likelihood of goodwill impairment. Third, Ramanna and Watts (2012); Li and Sloan (2015) suggest that SFAS 142 provides managers with discretion in respect to the timing and the magnitude of goodwill losses recognized. This study complements the findings and associated interpretations in Ramanna and Watts (2012); Li and Sloan (2015) by providing another explanation. That is, it is possible that managers with greater ability better prevent or reduce goodwill impairment. Last, from a practical perspective, the results should interest policy makers who design and implement guidelines on goodwill impairment decisions. Results should also interest shareholders by showing the importance of more-able managers in preventing goodwill impairment and reducing the magnitude of goodwill impairment losses after goodwill impairment occurs.

The rest of this paper is organized as follows. Section 2 describes the institutional background, while Section 3 presents literature review and hypothesis development. Section 4 describes the research design, and Section 5 presents the results of the empirical analyses. Section 6 presents the results of additional analyses, and Section 7 concludes this study.

[2] It is possible that mangers with greater ability better exploit the discretion by SFAS 142 to avoid/delay goodwill impairment or understate goodwill impairment losses. To purge this possible explanation, I follow Ramanna and Watts (2012) by including variables to control for managers' opportunistic behavior in the regression analysis.

[3] Firms have goodwill reported in at least one year during the sample period.

2. Background

Prior to 2001, goodwill accounting in the U.S. was governed by Accounting Principles Board (APB) Opinion No. 16. Under APB 16, any excess of purchase price over the fair value of the acquired firm's net assets was recognized as goodwill. Goodwill was viewed as a depreciating asset. The value of goodwill in a purchase acquisition was then amortized over a period of up to 40 years. To avoid the impact of goodwill amortization expenses on earnings, many firms chose the pooling of interest acquisition method in which purchased goodwill was not recognized and amortized.

In June 2001, FASB issued Statement of Financial Accounting Standards 142 (SFAS 142), *Goodwill and Other Intangible Assets*. SFAS 142 eliminated the pooling of interest acquisition method and required all business acquisitions be accounted for by the purchase acquisition method. In addition, SFAS 142 required sufficient disclosure of the allocation of the purchase price among the assets acquired. SFAS 142 required annual tests for goodwill and other intangible assets. Specifically, it stated that goodwill should be tested for impairment using a two-step process. In the first step, companies compare the carrying value of the reporting unit (including goodwill) to the estimated fair value of the reporting unit. If the carrying value of the reporting unit is less than the estimated fair value of the reporting unit, no impairment in goodwill exists. If the carrying value of the reporting unit exceeds the estimated fair value of the reporting unit, companies perform the second step: to determine and recognize the amount of goodwill impairment loss, which is recorded against earnings. The impairment loss is measured as the difference between the implied value and the carrying value of goodwill. In addition, any reversals of goodwill impairment losses are prohibited. SFAS 142 also required firms to disclose the carrying value and any changes in carrying value of goodwill. In 2011, FASB issued Accounting Standard Update 350 (ASU 350), which permits companies to first assess qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying value. Based on the assessment of qualitative factors, companies then determine whether it is necessary to perform the goodwill impairment test. ASU 350 became effective for fiscal year beginning after 12/15/2011.

3. Literature review and hypothesis development

3.1. Managerial ability

Upper echelons theory (Hambrick, 2007; Hambrick & Mason, 1984) states that organizational outcomes are partially influenced by managers' differing background characteristics. Bertrand and Schoar (2003) find that chief executive officers (CEOs) have different managerial styles, and these styles influence a wide range of corporate decisions. Other similar studies investigate the relationship between chief financial officer (CFO) expertise and restatements (Aier, Comprix, Gunlock, & Lee, 2005), CEO reputation and earnings quality (Francis, Nanda, & Olsson, 2008), managerial style and firm voluntary disclosure (Bamber & Wang, 2010), managerial style and corporate tax avoidance (Dyreng, Hanlon, & Maydew, 2010), and CFO style and accounting policies (Ge, Matsumoto, & Zhang, 2011). Taken together, this research supports the important role of individual managers in accounting choices and firm performance.

Demerjian et al. (2012) introduce a new measure of managerial ability based on managers' efficiency in generating revenues. They argue that more-able managers "better understand technology and industry trends, reliably predict product demand, invest in higher value projects, and manage their employees more efficiently than less-able managers" (page 1229). Demerjian et al. (2012) argue that their measure (a comprehensive summary measure on managerial ability) outperforms existing managerial ability measures. In

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addition, their measure is robust to CEO switch and is valued by the market.

Using their managerial ability measure, Demerjian et al. (2013) examine the relationship between managerial ability and earnings quality. They find that more-able managers are associated with fewer subsequent restatements, higher earnings and accruals persistence, lower errors in the bad debt provision, and higher-quality accrual estimations. Baik, Farber, and Lee (2011) find a positive relationship between CEO ability and management earnings forecast issuance. Wang (2013) examines the informativeness of insider trades conditional on managerial ability and finds that more-able managers have greater net insider sales before the earnings break than do less-able mangers. Demerjian et al. (2015) find that more-able managers better smooth earnings to benefit shareholders than do less-able managers. Francis et al. (2014) find a significant negative relationship between managerial ability and corporate tax avoidance, suggesting that more-able managers engage in fewer tax-avoidance activities, relative to less-able managers. Krishnan and Wang (2015) find negative relationships between managerial ability and both audit fees and going concern options, suggesting that managerial ability plays an important role in auditors' decisions.

3.2. Goodwill impairment

Prior studies on goodwill impairment can be classified into two categories: The first category examines the impact of goodwill impairment on the stock market and on various firm characteristics. Prior studies (e.g.Francis, Hanna, & Vincent, 1996; Henning & Shaw, 2003; Hirschey & Richardson, 2002; Li et al., 2011; Xu, Anandarajana, & Curatolab, 2011) find that goodwill impairment is value relevant to the market, and normally investors view goodwill impairment as negative news. For instance, Li et al. (2011) find that investors react negatively to goodwill impairment and conclude that goodwill impairment is a leading indicator of a decline in future firm performance. Regarding the impact of impairment on firm characteristics, Darrough et al. (2014) examine the relationship between goodwill impairment losses and CEO compensation and document that goodwill impairment losses lead to reduced CEO compensation. Sun and Zhang (2016) find a negative impact of goodwill impairment on bond credit ratings.

The second category investigates the determinants of goodwill impairment. Prior studies examine and find that the cause of many goodwill impairment losses is that the target firm is overpaid at the time of acquisition (e.g.Beatty & Weber, 2006; Gu & Lev, 2011; Hayn & Hughes, 2006; Li et al., 2011; Olante, 2013). Specifically, Beatty and Weber (2006) examine a sample of firms that are likely to have recorded a goodwill impairment loss and show that a firm's decision to accelerate or delay recognition of the loss is related to managerial incentives. They find evidence suggesting that firms are less likely to accelerate recognition of goodwill impairment if they have debt covenants affected by impairment, are listed on an exchange with delisting requirements, or have earnings-based bonus plans, and more likely to accelerate recognition when they have a CEO with a short tenure or a high earnings multiple. Olante (2013) estimates that approximately 40% of goodwill impairment losses are caused by overpayment at acquisition. Some studies investigate whether goodwill impairment is associated with economic factors at the firm level. For example, Chen, Kohlbeck, and Warfield (2008) and Chalmers, Godfrey, and Webster (2011) find that goodwill impairments better reflect the underlying economics of goodwill after the adoption of SFAS 142, supporting the FASB's claim that SFAS 142 "will improve financial reporting because the financial statements of entities that acquire goodwill and other intangible assets will better reflect the underlying economics of those assets" (SFAS 142, page 7). Other studies examine the role of managers' opportunistic behavior in determining goodwill impairment. Ramanna and Watts (2012) suggest that managers may avoid goodwill impairment under SFAS 142 when they have agency-based private information, because the current fair value of goodwill is a function of management's future actions such as firm strategy implementation. They also find a negative relationship between CEO tenure and goodwill impairment. Similarly, Li and Sloan (2015) argue that managers exploit the discretion granted by SFAS 142 to delay goodwill impairment.

3.3. Hypothesis development

Taken together, the literature review on managerial ability suggests that more-able managers better manage their firms to maximize shareholders' benefits, relative to less-able managers. Goodwill impairment is viewed as negative news that signals declining firm performance (Hirschey & Richardson, 2002). Hence, companies have incentives to prevent or reduce goodwill impairment losses (Li et al., 2011). If more-able managers better manage their firms to maximize shareholders' benefits, I predict that managers with greater ability are more likely to effectively find ways to prevent or reduce goodwill impairment. Therefore, I expect a negative relationship between managerial ability and goodwill impairment. I propose the following hypothesis:

H1. Managerial ability is negatively related to goodwill impairment.

4. Research design

4.1. Measurement of the primary independent variable—managerial ability

I use both the original managerial ability scores (MA) and decile rankings (MARANK) developed by Demerjian et al. (2012) as proxies for managerial ability in this study. Their managerial ability measure is a performance-based measure of managers' efficiency in using firms' resources to generate revenue. Demerjian et al. (2012) use a two-step approach to develop their managerial ability measure. First, they rely on Data Envelopment Analysis (DEA) to estimate total firm efficiency by industry and year. Given a collection of points in a multidimensional space, DEA fits a piecewise linear envelope or frontier to the given data. The envelope indicates a normative ideal given the existing data. Points located on the envelope are optimally efficient, while points below the envelope are inefficient. DEA evaluates all points with respect to their deviation from the frontier. The values of the points on the frontier equal 1, and the values of other points which operate beneath the frontier are between 0 and 1. DEA requires identifying input and output variables. Demerjian et al. (2012) use seven input variables: cost of goods sold; selling, general and administrative expenses; property, plant and equipment; operating lease; research and development cost; goodwill; and other intangibles. The output variable in Demerjian et al. (2012) is net sales.

Demerjian et al. (2012) acknowledge that total firm efficiency can be attributed to both manager-specific characteristics and firm-specific characteristics. Therefore, their second step is to identify the manager-specific characteristics of the total firm efficiency from DEA results. Thus, Demerjian et al. (2012) regress the total firm efficiency on six firm-specific variables that could aid or hinder managers' ability. These six variables include firm size, firm market share, cash available, firm age, operational complexity, and foreign operations. This regression is run by industry and with year fixed effects to purge industry and year effects. Demerjian et al. (2012) use the residuals from the regression as proxy for managerial ability. Demerjian et al. (2012) also transform the raw residual scores from the above regression into an industry-based decile ranking for a given year.

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4.2. Empirical specification

I use the following equations to test the influence of managerial ability on goodwill impairment:

$$GWI = \beta_0 + \beta_1 \times \boldsymbol{MA/MARANK} + \beta_2 \times UNVA + \beta_3 \times DCOVPRO + \beta_4 \times LIST + \beta_5 \times APC + \beta_6 \times FOG + \beta_7 \times SIZE + \beta_8 \times ROA + \beta_9 \times LEV + \beta_{10} \times MTB + \beta_{11} \times GDW + \beta_{12} \times WD + \beta_{13} \times RC + \beta_{14} \times \mathrm{OSI} + \varepsilon. \quad (1)$$

$$GWILOSS = \beta_0 + \beta_1 \times \boldsymbol{MA/MARANK} + \beta_2 \times UNVA + \beta_3 \times DCOVPRO + \beta_4 \times LIST + \beta_5 \times APC + \beta_6 \times FOG + \beta_7 \times SIZE + \beta_8 \times ROA + \beta_9 \times LEV + \beta_{10} \times MTB + \beta_{11} \times GDW + \beta_{12} \times WD + \beta_{13} \times RC + \beta_{14} \times \mathrm{OSI} + \varepsilon. \quad (2)$$

In Eq. (1), the dependent variable (GWI) captures the likelihood of goodwill impairment. It is an indicator variable which takes 1 if the firm-year observation has goodwill impairment loss and otherwise 0. Hence, I use logistic regression. In Eq. (2), the dependent variable (GWILOSS) measures the magnitude of goodwill impairment losses[4] scaled by total assets. Consistent with prior studies (e.g., Li et al., 2011), I use Tobit regression[5] in Eq. (2) because the values of GWILOSS are between 0 and 1. All variables are defined in Appendix 1. To test the hypothesis, I analyze the coefficient β_1 on MA and MARANK. If the hypothesis is valid, I expect a negative and significant coefficient on managerial ability (MA and MARANK).

Prior research (e.g., Ramanna & Watts, 2012) suggests that managers use their discretion opportunistically to delay/avoid goodwill impairment or understate the magnitude of goodwill impairment losses. Hence, it is possible for more-able managers to better exploit the discretion opportunistically by SFAS 142, relative to less-able managers. This can be a possible explanation for the negative relationship between managerial ability and goodwill impairment. To purge this possible explanation, I follow Ramanna and Watts (2012) by including variables to control for managers' opportunistic behavior in the regression analysis. Specifically, I first use unverifiable net assets (UNVA) to control for managers' flexibility in goodwill reporting. Ramanna and Watts (2012) argue that firms with more unverifiable net assets have smaller goodwill impairment losses. I calculate UNVA using the model in Richardson, Sloan, Soliman, and Tuna (2005). Second, I use debt covenant probability (DCOVPRO) and whether a firm is listed on NASDAQ or AMEX (LIST) to control for managers' contracting motive. Ramanna and Watts (2012) argue that the probability of debt covenant violation is high for firms with 2 years of market-to-book ratio (MTB) < 1. Beatty and Weber (2006) argue that firms listed on the NASDAQ or AMEX are subject to goodwill-inclusive delisting requirements. Third, I use asset pricing concerns (APC) to control for managers' valuation motives in goodwill impairment. Consistent with Beatty and Weber (2006), I calculate APC as the coefficient from a regression of the firm's quarterly share price on its operating income using at least 16 quarters of data prior to the firm-year. Last, I use the readability[6] (FOG) of 10Ks to control for managers' private information motive in goodwill impairment. Ramanna and Watts (2012) argue that managers with positive private information are less likely to engage in opportunistic behavior. As a result, such managers generate more readable 10Ks.

In addition to the variable of interest, I also control for factors associated with goodwill impairment losses established in prior literature. Gu and Lev (2011) control market-to-book ratio, return on assets and goodwill. Ramanna and Watts (2012) control leverage ratio. Darrough et al. (2014) suggest goodwill impairment is related to contemporaneous firm events such as long-term asset write-downs, restructuring charges, and other special items. Following Gu and Lev (2011), Ramanna and Watts (2012), and Darrough et al. (2014), I control for firm size (SIZE), return on assets (ROA), leverage ratio (LEV), market-to-book ratio (MTB), goodwill (GDW), long-term assets write-downs (WD), restructuring charges (RC), and other special items (OSI). I winsorize the variables at level 1% and 99% and control for year and industry fixed effects (Fama and French 48 industries) in the regression analysis. See Appendix 1 for variable definitions.

4.3. Sample selection and descriptive statistics

I use 2002 as the initial testing year because SFAS 142 became effective in 2002. Consistent with Li and Sloan (2015), I end my sample in 2011 as Accounting Standards Update (ASU) 350–20 became effective after 12/15/2011. I begin the sample selection process by using the managerial ability scores and ranks by Demerjian et al. (2012). There are 53,766 firm-year observations from 2002 to 2011. Next, I use Compustat to obtain financial statement data, which includes total assets (AT, #6), book value of equity (CEQ, #60), cash (CHE, #1), common stock shares (CSHO, #25), debt in current liabilities (DLC, #34), long-term debt (DLTT, #9), goodwill (GDWL, #204), goodwill impairment loss (GDWLIP, #368), investments and advances (IVAO, #32), short-term investments (IVST, #193), total liabilities (LT, #181), net income (NI, #172), stock price at fiscal year end (PRCC_F, #24), preferred stock (PSTK, #130), restructuring costs (RCP, #376), sales (SALE, #12), special items (SPI, #17), and long-term assets write-downs (WDP, #380). The initial sample from Compustat including the above 18 variables consists of 110,991 observations from 2002 to 2011. I merge the above two samples. Some observations are lost due to missing observations in Compustat. Next, I remove observations that do not have goodwill. The final sample with complete data consists of 30,426 firm-year observations, of which 4576 observations are firm-years with goodwill impairment losses (the goodwill impairment sample) and 25,850 observations are firm-years without goodwill impairment losses (the no goodwill impairment sample).

Panel A of Table 1 reports the distribution of firm-year observations by year for the goodwill impairment sample firms and no goodwill impairment sample firms. For goodwill impairment sample firms, there are 599 firm-year observations in 2002 and 415 observations in 2011. 2008 has the largest number of observations (959). This is consistent with Darrough et al. (2014), who also find that 2008 has the largest number of goodwill impairments. For no goodwill impairment sample firms, there are 2678 firm-year observations in 2002 and 2234 observations in 2011. 2004 has the largest number of observations (2953). Panel B of Table 1 reports the distribution of firm-year observations by industry for the top 10 industries. For the goodwill impairment sample, the most heavily represented industry is business services (16.30%, SIC 73), followed by electric equipment (11.01%, SIC 36) and communications (9.27%, SIC 48). For the no goodwill impairment sample, the most heavily represented industry is business services (17.78%, SIC 73), followed by electric equipment (8.80%, SIC 36) and chemical (8.43%, SIC 28).

Table 2 presents descriptive statistics for the full sample partitioned based on goodwill impairment (obs. = 4576) and no goodwill impairment losses observations (obs. = 25,850). Specifically, Table 2 reports the mean, standard deviation, median, 25th percentile and 75th percentile of the following variables: GWILOSS, MA, MARANK, UNVA, DCOVPRO, LIST, APC, FOG, SIZE, ROA, LEV, MTB, GDW, WD, RC, and OSI for both subsamples (the goodwill impairment sample vs. the no goodwill impairment sample). For the goodwill impairment sample (no goodwill impairment sample), the mean values of MA and MARANK are −0.035 (−0.001) and 0.493 (0.557), respectively. The no goodwill impairment sample firms have higher managerial ability relative to the goodwill impairment sample firms. For the goodwill

[4] Goodwill impairment loss (GDWLIP) is reported as a negative number in Compustat. I multiply GDWLIP by −1.

[5] Tobit regression does not compute an adjusted R squared. I obtain the adjusted R squared from OLS regression.

[6] Readability data (FOG Index) is provided by Dr. Feng Li. Li (2008) examines the relationship between readability of 10 K and earnings.

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Table 1
Distribution of firm-year observations.

Panel A: Distribution of firm-year observations by year

	Goodwill impairment			No goodwill impairment		
Year	Obs.	% of sample	Cumulative %	Obs.	% of sample	Cumulative %
2002	599	13.09%	13.09%	2678	10.36%	10.36%
2003	349	7.63%	20.72%	2856	11.05%	21.41%
2004	326	7.12%	27.84%	2953	11.42%	32.83%
2005	356	7.78%	35.62%	2897	11.21%	44.04%
2006	324	7.08%	42.70%	2883	11.15%	55.19%
2007	371	8.11%	50.81%	2757	10.67%	65.86%
2008	959	20.96%	71.77%	2061	7.97%	73.83%
2009	575	12.57%	84.33%	2161	8.36%	82.19%
2010	302	6.60%	90.93%	2370	9.17%	91.36%
2011	415	9.07%	100.00%	2234	8.64%	100.00%
	4576	100.00%		25,850	100.00%	

Panel B: Distribution of firm-year observations by industry: top 10 industries

Goodwill impairment				No goodwill impairment			
2 SIC	Industry description	Obs.	% of sample	2 SIC	Industry description	Obs.	% of sample
73	Business services	746	16.30%	73	Business services	4442	17.18%
36	Electronic equipment	504	11.01%	36	Electronic equipment	2276	8.80%
48	Communications	424	9.27%	28	Chemicals products	2178	8.43%
28	Chemicals products	275	6.01%	38	Measuring instruments	1892	7.32%
35	Industrial machinery	272	5.94%	35	Industrial machinery	1679	6.50%
38	Measuring instruments	198	4.33%	48	Communications	1340	5.18%
37	Transportation equipment	143	3.13%	13	Oil & gas extraction	746	2.89%
20	Food products	118	2.58%	20	Food products	737	2.85%
13	Oil and gas extraction	105	2.29%	80	Health services	668	2.58%
50	Wholesale durable goods	98	2.14%	37	Transportation equipment	655	2.53%

impairment sample, the mean and median values of goodwill impairment losses (GWILOSS) are 0.076 and 0.035, respectively. The mean and median values of unverifiable net assets (UNVA) are 0.245 (0.168) and 0.079 (0.042) in the goodwill impairment sample (no goodwill impairment sample), suggesting that goodwill impairment sample firms have more unverifiable net assets. The mean value of 10 K readability (FOG) is 0.860 (0.812) in the goodwill impairment sample (no goodwill impairment sample), suggesting that 10Ks of goodwill impairment sample firms are less readable. The median value of ROA in the goodwill impairment sample (no goodwill impairment sample) is −0.076 (0.045), suggesting that goodwill impairment sample firms demonstrate worse accounting performance. Using a t-test, I also test the significance of the differences in means of the variables. For all variables in Table 2, (two-tailed) p-values suggest that the differences in means are significant (p-value < 0.0001). For example, average managerial ability (MA/MARANK) of the no goodwill impairment sample firms is significantly higher than the average managerial ability of the goodwill impairment sample firms, suggesting that more-able managers better prevent goodwill impairment.

Panel A (B) of Table 3 provides the correlation matrices for selected variables for the full sample (the goodwill impairment sample). For each pair of variables, the Spearman correlation coefficients and related p-values are provided. I use Spearman correlation in this study because of the discrete nature of the variables such as GWI and MARANK. Panel A of Table 3 reports a significant and negative (p-value < 0.0001) relationship between GWI and managerial ability (MA and MARANK). The negative association suggests that more-able managers better prevent goodwill impairment. Using the goodwill impairment

Table 2
Descriptive statistics goodwill impairment vs. no goodwill impairment.

	Goodwill impairment					No goodwill impairment					
Variable	Obs.	Mean	25P	Median	75P	Obs.	Mean	25P	Median	75P	Difference in means
GWILOSS	4576	0.076	0.006	0.035	0.124	–	–	–	–	–	–
MA	4576	−0.035	−0.126	−0.044	0.047	25,850	−0.001	−0.093	−0.013	0.079	<0.0001
MARANK	4576	0.493	0.300	0.500	0.700	25,850	0.557	0.300	0.600	0.800	<0.0001
UNVA	4576	0.245	−0.503	0.079	0.723	25,850	0.168	−0.457	0.042	0.546	<0.0001
DCOVPRO	4576	0.429	0.000	0.000	1.000	25,850	0.174	0.000	0.000	0.000	<0.0001
LIST	4576	0.384	0.000	0.000	1.000	25,850	0.452	0.000	0.000	1.000	<0.0001
APC	4576	15.505	−3.456	9.726	24.883	25,850	12.428	−7.223	3.583	26.677	<0.0001
FOG	4576	0.860	1.000	1.000	1.000	25,850	0.812	1.000	1.000	1.000	<0.0001
SIZE	4576	6.133	4.367	6.166	7.931	25,850	6.281	4.795	6.291	7.768	<0.0001
ROA	4576	−0.196	−0.266	−0.076	0.020	25,850	0.006	−0.008	0.045	0.093	<0.0001
LEV	4576	0.203	0.004	0.141	0.314	25,850	0.177	0.002	0.128	0.278	<0.0001
MTB	4576	1.552	0.593	1.149	2.064	25,850	2.702	1.241	2.015	3.360	<0.0001
GDW	4576	0.137	0.000	0.083	0.225	25,850	0.164	0.040	0.117	0.250	<0.0001
WD	4576	−0.012	−0.006	0.000	0.000	25,850	−0.003	0.000	0.000	0.000	<0.0001
RC	4576	−0.007	−0.006	0.000	0.000	25,850	−0.003	−0.001	0.000	0.000	<0.0001
OSI	4576	−0.253	−0.333	−0.175	−0.062	25,850	−0.219	−0.289	−0.130	−0.044	<0.0001

This table reports the descriptive statistics for goodwill impairment and no goodwill impairment samples over the period of 2002–2011. The goodwill impairment sample consists of 4576 firm-year observations and the no goodwill impairment sample consists of 25,850 firm-year observations. Two-tailed p-values are provided in the last column for the difference in means test. Refer to Appendix 1 for variable definitions.

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Table 3
Correlations among selected variables.

Panel A: Full sample (Obs. = 30,426)

	GWI	MA	MARANK	UNVA	DCOVPRO	LIST	APC	FOG	SIZE	ROA	LEV	MTB	GDW	WD	RC
MA	−0.086														
p-value	*<.0001*														
MARANK	−0.082	0.950													
p-value	*<.0001*	*<.0001*													
UNVA	0.017	0.004	−0.013												
p-value	0.003	0.533	0.029												
DCOVPRO	0.223	−0.108	−0.110	−0.047											
p-value	*<.0001*	*<.0001*	*<.0001*	*<.0001*											
LIST	−0.048	−0.045	−0.040	−0.270	−0.068										
p-value	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*										
APC	0.273	0.260	0.236	0.099	−0.326	−0.204									
p-value	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*									
FOG	−0.044	−0.636	−0.670	0.040	0.063	0.003	−0.121								
p-value	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	0.575	*<.0001*								
SIZE	−0.018	0.090	0.066	0.261	−0.186	−0.297	0.588	−0.022							
p-value	0.002	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*							
ROA	−0.309	0.322	0.302	−0.022	−0.338	−0.012	0.772	−0.195	0.327						
p-value	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	0.040	*<.0001*	*<.0001*	*<.0001*						
LEV	0.031	−0.040	−0.050	0.593	0.095	−0.261	0.082	0.049	0.362	−0.063					
p-value	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001					
MTB	−0.213	0.147	0.156	0.019	−0.708	0.060	0.309	−0.112	0.124	0.363	−0.079				
p-value	*<.0001*	*<.0001*	*<.0001*	0.001	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*				
GDW	−0.115	0.023	0.030	0.152	−0.088	−0.008	0.055	−0.008	0.034	0.006	0.110	0.058			
p-value	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	0.140	*<.0001*	0.150	*<.0001*	0.277	*<.0001*	*<.0001*			
WD	−0.229	0.089	0.079	−0.010	−0.094	0.026	0.151	−0.043	−0.030	0.198	−0.033	0.096	0.042		
p-value	*<.0001*	*<.0001*	*<.0001*	0.079	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*		
RC	−0.117	0.086	0.074	−0.016	−0.021	0.041	0.066	−0.072	−0.204	0.145	−0.073	0.055	−0.060	0.143	
p-value	*<.0001*	*<.0001*	*<.0001*	0.005	0.000	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	
OSI	−0.061	−0.037	−0.042	−0.128	0.040	0.004	0.032	0.031	−0.003	0.058	−0.098	−0.032	−0.857	−0.004	0.060
p-value	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	0.541	*<.0001*	*<.0001*	0.559	*<.0001*	*<.0001*	*<.0001*	*<.0001*	0.443	*<.0001*

This table presents the Spearman correlations based on the full sample of 30,426 firm-year observations over the period of 2002–2011. Two-tailed p-values are provided. Refer to Appendix 1 for variable definitions.

Panel B: Goodwill impairment sample (Obs. = 4576)

	GWILOSS	MA	MARANK	UNVA	DCOVPRO	LIST	APC	FOG	SIZE	ROA	LEV	MTB	GDW	WD	RC
MA	−0.038														
p-value	0.001														
MARANK	−0.032	0.949													
p-value	0.003	*<.0001*													
UNVA	−0.134	0.054	0.028												
p-value	*<.0001*	0.000	0.059												
DCOVPRO	0.228	−0.066	−0.083	−0.135											
p-value	*<.0001*	*<.0001*	*<.0001*	*<.0001*											
LIST	−0.085	−0.029	−0.031	−0.168	−0.025										
p-value	*<.0001*	0.047	0.036	*<.0001*	0.096										
APC	0.524	0.199	0.190	0.030	−0.249	−0.102									
p-value	*<.0001*	*<.0001*	*<.0001*	0.043	*<.0001*	*<.0001*									
FOG	−0.003	−0.584	−0.605	0.004	0.035	0.002	−0.085								
p-value	0.826	*<.0001*	*<.0001*	0.784	0.018	0.886	*<.0001*								
SIZE	−0.421	0.072	0.057	0.303	−0.244	−0.164	0.075	−0.012							
p-value	*<.0001*	*<.0001*	0.000	*<.0001*	*<.0001*	*<.0001*	*<.0001*	0.422							
ROA	−0.698	0.216	0.194	0.186	−0.313	−0.045	0.672	−0.088	0.560						
p-value	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	0.003	*<.0001*	*<.0001*	*<.0001*						
LEV	−0.085	0.005	−0.002	0.481	−0.009	−0.187	−0.071	0.018	0.401	0.138					
p-value	<.0001	0.733	0.885	<.0001	0.563	<.0001	<.0001	0.235	<.0001	<.0001					
MTB	−0.260	0.081	0.094	0.195	−0.857	0.027	0.277	−0.035	0.252	0.349	0.002				
p-value	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	0.067	*<.0001*	0.019	*<.0001*	*<.0001*	0.904				
GDW	−0.048	0.104	0.114	0.210	−0.236	−0.036	0.122	−0.062	0.251	0.199	0.178	0.231			
p-value	0.001	*<.0001*	*<.0001*	*<.0001*	*<.0001*	0.015	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*			
WD	−0.137	0.094	0.085	0.059	−0.056	−0.036	0.197	−0.034	0.075	0.210	0.020	0.057	0.061		
p-value	*<.0001*	*<.0001*	*<.0001*	*<.0001*	0.000	0.016	*<.0001*	0.021	*<.0001*	*<.0001*	0.173	0.000	*<.0001*		
RC	−0.045	0.075	0.063	0.037	0.040	−0.062	0.245	−0.045	−0.201	0.074	−0.020	−0.029	−0.028	0.085	
p-value	0.002	*<.0001*	*<.0001*	0.013	0.007	*<.0001*	*<.0001*	0.002	*<.0001*	*<.0001*	0.178	0.048	0.059	*<.0001*	
OSI	−0.502	−0.094	−0.106	−0.073	0.067	−0.003	0.130	0.090	0.040	0.269	−0.079	−0.044	−0.661	0.003	0.022
p-value	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	0.831	*<.0001*	*<.0001*	0.007	*<.0001*	*<.0001*	0.003	*<.0001*	0.834	0.133

This table reports the Spearman correlations based on the goodwill impairment sample of 4576 firm-year observations over the period of 2002–2011. Two-tailed p-values are provided. Refer to Appendix 1 for variable definitions.

sample (obs. = 4576), Panel B of Table 3 reports a significant and negative relationship between GWILOSS and managerial ability (MA and MARANK). The negative association suggests that more-able managers can better reduce the magnitude of goodwill impairment losses after goodwill impairment occurs. Overall, results in Table 3 lend support to the hypothesis.

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5. Results

Using the full sample (obs. = 30,426), Table 4 reports the Logistic regression results testing the hypothesis. The coefficient on MA is −0.847 (p-value < 0.0001) and on MARANK is −0.409 (p-value < 0.0001). The negative and significant coefficients support the hypothesis that managerial ability is negatively related to the likelihood of goodwill impairment. This evidence suggests that more-able managers can better prevent goodwill impairment relative to less-able managers. For the control variables, GWI is significantly and positively associated with UNVA, DCOVPRO, APC, and LEV, but negatively associated with LIST, SIZE, ROA, MTB, GDW, WD, RC, and OSI.

Using the goodwill impairment sample (obs. = 4576), Table 5 reports the Tobit regression results[7] testing the hypothesis. The coefficient on MA is −0.020 (p-value = 0.009) and on MARANK is −0.008 (p-value = 0.022). The negative and significant coefficients support the hypothesis that managerial ability is negatively related to goodwill impairment losses, suggesting that more-able managers can better reduce the magnitude of goodwill impairment losses, relative to less-able managers. For the control variables, GWILOSS is significantly and positively associated with APC, but negatively associated with LIST, FOG, SIZE, ROA, LEV, MTB, GDW, RC, and OSI. The significantly positive relationship between GWILOSS and APC and the significantly negative relationships between GWILOSS and both LIST and FOG are consistent with the findings in Ramanna and Watts (2012). For example, Ramanna and Watts (2012) find that firms listed on NASDAQ or AMEX report smaller goodwill impairment losses. The significantly negative relationships between GWI and both RC and OSI are consistent with the findings in Darrough et al. (2014). For example, Darrough et al. (2014) find that contemporaneous firm events such as long-term assets write-downs (WD), restructuring charges (RC), and other special items (OSI) result in smaller goodwill impairment losses.

Table 4
Managerial ability and likelihood of goodwill impairment.*, **
Model: GWI = f (MA/MARANK; control variables).

Variable	Estimate	Pr > ChiSq	Variable	Estimate	Pr > ChiSq
Intercept	−2.051	<.0001	Intercept	−1.836	<.0001
MA	−0.847***	<.0001	MARANK	−0.409***	<.0001
UNVA	0.049***	<.0001	UNVA	0.048***	<.0001
DCOVPRO	0.812***	<.0001	DCOVPRO	0.808***	<.0001
LIST	−0.117***	0.003	LIST	−0.117***	0.003
APC	0.001***	<.0001	APC	0.001***	<.0001
FOG	−0.064	0.339	FOG	−0.048	0.466
SIZE	−0.114***	<.0001	SIZE	−0.113***	<.0001
ROA	−1.406***	<.0001	ROA	−1.409***	<.0001
LEV	0.262***	0.004	LEV	0.260***	0.004
MTB	−0.016***	0.001	MTB	−0.016***	0.001
GDW	−1.660***	<.0001	GDW	−1.650***	<.0001
WD	−13.298***	<.0001	WD	−13.329***	<.0001
RC	−13.475***	<.0001	RC	−13.493***	<.0001
OSI	−0.269***	0.001	OSI	−0.262***	0.001
Industry	Included		Industry	Included	
Year	Included		Year	Included	
Obs.	30,426		Obs.	30,426	
Pseudo R^2	0.2069		Pseudo R^2	0.2068	

This table presents the results of logistic regressions with industry and year effects based on the full sample, including goodwill impairment sample and no goodwill impairment sample, over the period of 2002–2011. The dependent variable (GWI), capturing the likelihood of goodwill impairment losses, takes a value of one if the firm-year observation has a goodwill impairment loss and zero otherwise. The industry-specific and year-specific intercepts are omitted for brevity. Continuous control variables are winsorized at 1% and 99% percentiles each year before entering the regression tests. Refer to Appendix 1 for variable definitions.

* Significance at the 10% (two-tailed) confidence level.
** Significance at the 5% (two-tailed) confidence level.
*** Significance at the 1% (two-tailed) confidence levels.

6. Additional tests

6.1. Alternative sample periods

Due to the financial crisis, I use two alternative testing periods: pre-2008 vs. post-2008. This test examines the extent to which changes in firm level and macroeconomic risk factors affect the relationship between managerial ability and goodwill impairment. Table 6 reports the regression results testing the hypothesis for both periods. In the pre-2008 period, the coefficient on MA is −0.023 (p-value = 0.048) and on MARANK is −0.008 (p-value = 0.054). In the post-2008 period, the coefficient on MA is −0.022 (p-value = 0.030) and on MARANK is −0.010 (p-value = 0.032). The negative and significant coefficients support the hypothesis that managerial ability is negatively related to goodwill impairment losses, consistent with my earlier findings.

6.2. Fixed-effects regression analysis

Although I control for several variables that are possibly related to managerial ability and/or goodwill impairment losses, this procedure may not effectively address the omitted-variable bias induced by unknown firm characteristics. For example, some unknown variable may affect managerial ability and goodwill impairment simultaneously. To mitigate the omitted-variable concern, I use fixed-effects regression, which removes the cross-sectional variation and analyzes only the variation over time within a firm. Because industry dummies are time-invariant, I exclude them in the fixed-effects regression (Jiraporn, Jiraporn, Boeprasert, & Chang, 2014).

Table 5
Managerial ability and magnitude of goodwill impairment.*
Model: GWILOSS = f (**MA/MARANK**; control variables).

Variable	Estimate	Pr > ChiSq	Variable	Estimate	Pr > ChiSq
Intercept	0.019	0.001	Intercept	0.016	0.015
MA	−0.020***	0.009	MARANK	−0.008**	0.022
UNVA	−0.000	0.368	UNVA	−0.000	0.366
DCOVPRO	0.001	0.551	DCOVPRO	0.001	0.524
LIST	−0.004**	0.015	LIST	−0.004**	0.015
APC	0.000***	<.0001	APC	0.000***	<.0001
FOG	−0.007**	0.014	FOG	−0.006**	0.031
SIZE	−0.002***	<.0001	SIZE	−0.002***	<.0001
ROA	−0.110***	<.0001	ROA	−0.110***	<.0001
LEV	−0.014***	0.000	LEV	−0.014***	0.000
MTB	−0.001***	0.000	MTB	−0.001***	0.000
GDW	−0.283***	<.0001	GDW	−0.283***	<.0001
WD	−0.037	0.414	WD	−0.037	0.417
RC	−0.177**	0.042	RC	−0.179**	0.039
OSI	−0.389***	<.0001	OSI	−0.389***	<.0001
Industry	Included		Industry	Included	
Year	Included		Year	Included	
Obs.	4576		Obs.	4576	
Adj. R^2	0.7029		Adj. R^2	0.7028	

This table presents the results of Tobit regressions with industry and year effects based on the goodwill impairment sample over the period of 2002–2011. The dependent variable (GWILOSS) measures the magnitude of goodwill impairment losses. The industry-specific and year-specific intercepts are omitted for brevity. Continuous control variables are winsorized at 1% and 99% percentiles each year before entering the regression tests. Refer to Appendix 1 for variable definitions.

* Significance at the 10% (two-tailed) confidence level.
** Significance at the 5% (two-tailed) confidence level.
*** Significance at the 1% (two-tailed) confidence levels.

[7] I also use clustered standard errors regression and obtain similar results. Petersen (2009) states that the residuals of a given firm may be correlated across years (firm effect) and the residuals of a given year may be correlated across different firms (i.e., time effect) in studies using panel data sets. To better control for the firm and time effects, the author suggests the use of clustered standard errors regression.

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Table 6
Managerial ability and magnitude of goodwill impairment alternative sample period.
Model: GWILOSS = f (MA/MARANK; control variables).

2002–2007						2008–2011					
Variable	Estimate	Pr > ChiSq	Variable	Estimate	Pr > ChiSq	Variable	Estimate	Pr > ChiSq	Variable	Estimate	Pr > ChiSq
Intercept	0.030	<.0001	Intercept	0.027	0.002	Intercept	0.008	0.302	Intercept	0.003	0.769
MA	−0.023**	0.048	MARANK	−0.008*	0.054	MA	−0.022**	0.030	MARANK	−0.010**	0.032
UNVA	−0.000	0.678	UNVA	−0.000	0.688	UNVA	−0.001	0.251	UNVA	−0.001	0.231
DCOVPRO	0.000	0.930	DCOVPRO	0.000	0.922	DCOVPRO	0.007***	0.002	DCOVPRO	0.007***	0.002
LIST	−0.002	0.416	LIST	−0.002	0.416	LIST	−0.006***	0.004	LIST	−0.006***	0.004
APC	0.000***	0.002	APC	0.000***	0.002	APC	0.000***	0.002	APC	0.000***	0.002
FOG	−0.006	0.184	FOG	−0.004	0.315	FOG	−0.009**	0.015	FOG	−0.009**	0.019
SIZE	−0.003***	<.0001	SIZE	−0.003***	<.0001	SIZE	−0.002**	0.010	SIZE	−0.002**	0.012
ROA	−0.116***	<.0001	ROA	−0.115***	<.0001	ROA	−0.108***	<.0001	ROA	−0.108***	<.0001
LEV	−0.009*	0.097	LEV	−0.009*	0.099	LEV	−0.018***	0.000	LEV	−0.018***	0.000
MTB	−0.002***	<.0001	MTB	−0.002***	<.0001	MTB	−0.000	0.606	MTB	−0.000	0.603
GDW	−0.235***	<.0001	GDW	−0.236***	<.0001	GDW	−0.356***	<.0001	GDW	−0.356***	<.0001
WD	−0.075	0.255	WD	−0.075	0.255	WD	−0.009	0.883	WD	−0.009	0.892
RC	−0.129	0.277	RC	−0.128	0.283	RC	−0.323**	0.011	RC	−0.323**	0.012
OSI	−0.345***	<.0001	OSI	−0.346***	<.0001	OSI	−0.456***	<.0001	OSI	−0.456***	<.0001
Industry	Included		Industry	Included		Industry	Included		Industry	Included	
Year	Included		Year	Included		Year	Included		Year	Included	
Obs.	2325		Obs.	2325		Obs.	2251		Obs.	2251	
Adj. R^2	0.6799		Adj. R^2	0.6798		Adj. R^2	0.7288		Adj. R^2	0.7288	

This table presents the results of Tobit regressions with industry and year effects based on the goodwill impairment sample for two alternative periods: pre-2008 and post-2008. The dependent variable (GWILOSS) measures the magnitude of goodwill impairment losses. The industry-specific and year-specific intercepts are omitted for brevity. Continuous control variables are winsorized at 1% and 99% percentiles each year before entering the regression tests. Refer to Appendix 1 for variable definitions.
* Significance at the 10% (two-tailed) confidence level.
** Significance at the 5% (two-tailed) confidence level.
*** Significance at the 1% (two-tailed) confidence level.

Table 7 reports that the coefficient on MA is −0.029 (p-value = 0.063) and on MARANK is −0.017 (p-value = 0.014). The fixed-effect regression suggests that, within firms, managerial ability is negatively related to goodwill impairment losses. Because the fixed-effects result is consistent with the primary result by Tobit regression, it does not appear that the conclusion is affected by endogeneity due to omitted-variable bias.

Table 7
Managerial ability and likelihood of goodwill impairment fixed effects regression.
Model: GWILOSS = f (**MA/MARANK**; control variables).

Variable	Estimate	Pr > |t|	Variable	Estimate	Pr > |t|
MA	−0.029*	0.063	MARANK	−0.017**	0.014
UNVA	−0.002**	0.015	UNVA	−0.002**	0.013
DCOVPRO	0.003	0.270	DCOVPRO	0.004	0.237
LIST	−0.005***	0.002	LIST	−0.005**	0.048
APC	0.000***	0.002	APC	0.000***	0.002
FOG	−0.009*	0.054	FOG	−0.010**	0.031
SIZE	−0.004	0.189	SIZE	−0.004	0.213
ROA	−0.144***	<.0001	ROA	−0.145***	<.0001
LEV	−0.002	0.837	LEV	−0.002	0.829
MTB	−0.001***	0.004	MTB	−0.001***	0.004
GDW	−0.316***	<.0001	GDW	−0.316***	<.0001
WD	−0.105	0.168	WD	−0.106	0.166
RC	0.304**	0.047	RC	0.301*	0.050
OSI	−0.352***	<.0001	OSI	−0.351***	<.0001
Industry	Not included		Industry	Not included	
Year	Included		Year	Included	
Obs.	4576		Obs.	4576	
Adj. R^2	0.7032		Adj. R^2	0.7031	

This table presents the results of fixed effects regressions with year effect based on the goodwill impairment sample over the period of 2002–2011. Company identifier used in fixed effects regression is GVKEY. The dependent variable (GWILOSS) measures the magnitude of goodwill impairment losses. The year-specific intercepts are omitted for brevity. Continuous control variables are winsorized at 1% and 99% percentiles each year before entering the regression tests. Refer to Appendix 1 for variable definitions.
* Significance at the 10% (two-tailed) confidence level.
** Significance at the 5% (two-tailed) confidence level.
*** Significance at the 1% (two-tailed) confidence level.

6.3. Two-stage OLS regression analysis (2SLS)

I explore the possibility of a reverse causality (self-selection) issue. For example, firms with large goodwill impairment losses are perhaps more likely to seek more-able managers. Following Jiraporn et al. (2014), I perform a two-stage OLS regression analysis, which controls for possible reverse causality. Two-stage regression analysis requires identifying an instrumental variable (IV) which is highly correlated to a firm's managerial ability but does not influence firm performance except through managerial ability. Consistent with Jiraporn et al. (2014), I use the average managerial ability performance of the firms in the same industry (first 2 SIC code). This variable is clearly related to the managerial ability of a given firm, but it does not relate to the goodwill impairment losses of a given firm. In the first stage of 2SLS, I estimate managerial ability score (MA) and rank (MARANK) using the average score (MA) and rank (MARANK) of the firms in the same industry. I include all of the control variables, as well as the industry and year dummy variables. In the second stage of 2SLS, I use the instrumented values of MA and MARANK from the first stage and include them as independent variables in the second-stage regression. I use the same control variables in the second-stage regression.

Table 8 reports the 2SLS results for testing the hypothesis. For the relationship between MA and GWILOSS, the first-stage regression reports the average MA is positively related (0.479) to individual MA at a significant level (p-value < 0.0001). The second stage reports that the coefficient of the instrumented MA is negative (−0.020) and highly significant (p-value = 0.009), suggesting that managers with greater ability better reduce goodwill impairment losses. For the relationship between MARANK and GWILOSS, the first-stage regression reports the average MARANK is positively related (0.429) to individual MARANK at a significant level (p-value < 0.0001). The second stage reports the coefficient of the instrumented MARANK is negative (−0.008) and significant (p-value = 0.023), suggesting that more-able managers better reduce the magnitude of goodwill impairment losses, relative to less-able managers. Overall, the two-stage OLS regression analysis (2SLS) lends support to the main results.

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Table 8
Managerial ability and likelihood of goodwill impairment two-stage regression analysis (2SLS).
Stage 1: MA/MARANK = f (average MA/MARANK; control variables).
Stage 2: GWILOSS = f (instrumented MA/MARANK; control variables).

	MA	GWILOSS	MARANK	GWILOSS
	Stage 1	Stage 2	Stage 1	Stage 2
Intercept	0.226	0.019	0.723	0.016
p-value	<.0001	0.001	<.0001	0.016
Average MA	0.479***			
p-value	<.0001			
MA (instrumented)		−0.020***		
p-value		0.009		
Average MARANK			0.429***	
p-value			<.0001	
MARANK (instrumented)				−0.008**
p-value				0.023
UNVA	−0.001	−0.000	−0.003*	−0.000
p-value	0.132	0.372	0.057	0.370
DCOVRPO	−0.002	0.001	−0.014*	0.001
p-value	0.642	0.554	0.063	0.527
LIST	−0.012***	−0.004**	−0.028***	−0.004**
p-value	0.000	0.016	<.0001	0.016
APC	0.000	0.000***	0.000	0.000***
p-value	0.641	<.0001	0.230	<.0001
FOG	−0.255***	−0.007**	−0.492***	−0.006**
p-value	<.0001	0.015	<.0001	0.033
SIZE	−0.003***	−0.002***	−0.007***	−0.002***
p-value	0.001	<.0001	<.0001	<.0001
ROA	0.110***	−0.110***	0.228***	−0.110***
p-value	<.0001	<.0001	<.0001	<.0001
LEV	−0.001	−0.014***	−0.006	−0.014***
p-value	0.901	0.000	0.696	0.000
MTB	0.001*	−0.001***	0.002**	−0.001***
p-value	0.055	0.000	0.044	0.000
GDW	−0.053***	−0.282***	−0.105***	−0.283***
p-value	0.000	<.0001	0.001	<.0001
WD	0.096	−0.037	0.295	−0.037
p-value	0.271	0.417	0.126	0.420
RC	0.065	−0.177**	0.398	−0.179*
p-value	0.699	0.043	0.281	0.041
OSI	−0.119***	−0.389***	−0.247***	−0.389***
p-value	<.0001	<.0001	<.0001	<.0001
Industry	Included	Included	Included	Included
Year	Included	Included	Included	Included
Obs.	4576	4576	4576	4576
Adj. R^2	0.5460	0.7029	0.4657	0.7027

The table presents the results of two-stage OLS regression analysis (2SLS) with industry and year effects based on the goodwill impairment sample. In the first stage of 2SLS, I estimate managerial ability score (MA) and rank (MARANK) using the average score (MA) and rank (MARANK) of the firms in the same industry. I include all of the control variables, as well as the industry and year dummy variables. In the second stage of 2SLS, I use the instrumented values of MA and MARANK from the first stage and include them as independent variables in the second-stage regression. I use the same control variables in the second-stage regression. The above procedures are applied in previous studies (e.g., Jiraporn et al., 2014). The industry-specific and year-specific intercepts are omitted for brevity. Continuous control variables are winsorized at 1% and 99% percentiles each year before entering the regression tests. Refer to Appendix 1 for variable definitions.
* Significance at the 10% (two-tailed) confidence level.
** Significance at the 5% (two-tailed) confidence level.
*** Significance at the 1% (two-tailed) confidence levels.

6.4. Managerial ability, CEO tenure, and goodwill impairment

Motivated by Beatty and Weber (2006) and Ramanna and Watts (2012), I incorporate CEO tenure into Eq. (2)[8] and find a significant (p-value = 0.010) and negative (−0.001) relationship between CEO tenure and the magnitude of goodwill impairment losses, suggesting that CEOs with longer tenure better reduce the magnitude of goodwill impairment losses. This is consistent with Beatty and Weber (2006) and Ramanna and Watts (2012). Furthermore, I find a significant (p-value = 0.024) and negative (−0.002) relationship between the interaction term (MARANK × TENURE) and the magnitude of goodwill impairment losses, suggesting that capable CEOs with longer tenure better reduce the magnitude of goodwill impairment losses than capable CEOs with shorter tenure. This finding offers another explanation for the negative relationship between managerial ability and goodwill impairment. That is, it is possible that managers with greater ability initially make better acquisition decisions when determining whether to make an acquisition that leads to the booking of goodwill. These better decisions at acquisition lead to smaller goodwill impairment losses. This explanation is in line with Gu and Lev (2011), who argue that many goodwill impairment losses are caused by managers' poor acquisition decisions. (See Table 9).

Table 9
Managerial ability, CEO tenure, and magnitude of goodwill impairment.
Model: GWILOSS = f (**M**ARANK, TENURE, MARANK × TENURE; control variables).

Variable	Estimate	Pr > ChiSq
Intercept	0.073	<.0001
MARANK	−0.016*	0.068
TENURE	−0.001**	0.010
MARANK × TENURE	−0.002**	0.024
UNVA	−0.000	0.664
DCOVPRO	0.000	0.901
LIST	−0.002	0.556
APC	0.000***	<.0001
FOG	−0.006	0.184
SIZE	−0.004***	0.000
ROA	−0.151***	<.0001
LEV	−0.005	0.582
MTB	−0.000	0.835
GDW	−0.169***	<.0001
WD	0.245***	0.000
RC	−0.179*	0.077
OSI	−0.195***	<.0001
Industry	Included	
Year	Included	
Obs.	1390	
Adj. R^2	0.6323	

This table presents the results of Tobit regression with industry and year effects based on the goodwill impairment sample over the period of 2002–2011. The above regression incorporates CEO tenure and the interaction term of managerial ability rank and CEO tenure. The dependent variable (GWILOSS) measures the magnitude of goodwill impairment losses. TENURE is the number of years since the CEO assumed the office. The industry-specific and year-specific intercepts are omitted for brevity. Continuous control variables are winsorized at 1% and 99% percentiles each year before entering the regression tests. Refer to Appendix 1 for variable definitions.
* Significance at the 101% (two-tailed) confidence level.
** Significance at the 51% (two-tailed) confidence level.
*** Significance at the 1% (two-tailed) confidence levels.

7. Conclusion

In this study, I examine the relationship between managerial ability and goodwill impairment. After controlling for managers' opportunistic behavior, the regression analysis reveals a negative relationship between managerial ability and goodwill impairment measured as the likelihood of goodwill impairment and the magnitude of goodwill impairment losses after goodwill impairment occurs. Findings suggest that more-able managers better prevent goodwill impairment and better reduce the magnitude of goodwill impairment losses, relative to less-able managers. I also perform various additional tests to address potential endogeneity issues. Additional tests provide consistent results. It is difficult to measure managerial ability because it is multidimensional. The managerial ability index scores by Demerjian et al. (2012) are an approximate measure of management performance. More precise measures of management performance may yield stronger results. Readers need to exercise caution when generalizing the conclusions.

[8] Following Ge et al. (2011), I hand collected CEO tenure data from various sources such as SEC's Edgar database, company websites, and internet search. I managed to collect CEO tenure data for 1390 firm-year observations. Hence, the sample consists of 1390 firm-year observations.

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Appendix 1. Variable definition

A.1. Dependent variables

GWI	=	An indicator variable that takes a value of one if the firm-year has a goodwill impairment loss and zero otherwise
GWILOSS	=	Goodwill impairment losses [GDWLIP (#368) × (−1)] scaled by total assets at $t-1$

A.2. Primary variables of interest

MA	=	Managerial ability score by Demerjian et al. (2012).
MARANK	=	Decile ranking of managerial ability score by Demerjian et al. (2012).

A.3. Control variables

UNVA	=	(−1) × [Cash (CHE, #1) + Short-term investment (IVST, #193) + Investments and advances (IVAO, #32) − Debt in current liabilities (DLC, #34) − Long-term liabilities (DLTT, #9) − Preferred stock (PSTK, #130)] divided by [Total assets (AT, #6) − Total liabilities (LT, #181)]
DCOVPRO	=	An indicator variable set to one if market to book ratio is less than one in year $t-1$ and year t, and zero otherwise
LIST	=	An indicator variable set to one if the firm trades on the NASDAQ or AMEX, and zero otherwise
APC	=	The coefficient from regressing a firm's price on its operating income using at least 16 and up to 20 quarters of data prior to year t
FOG	=	An indicator variable set to one if the Fog index is greater than 18 (unreadable), and zero otherwise
SIZE	=	Natural log of total assets (AT, #6)
ROA	=	Net income (NI, #172) scaled by total assets (AT, #6) at t − 1
LEV	=	Long-term liabilities (DLTT, #9) divided by total assets (AT, #6)
MTB	=	[Outstanding common shares (CHSO, #25)×Stock price at fiscal year end (PRCC_F, #24)] divided by total book value (CEQ, #60)
GDW	=	Total goodwill (GDWL, #204) scaled by total assets (AT, #6)
WD	=	Total long-term assets write-downs (WDP, #380) scaled by total assets (AT, #6) at t − 1
RC	=	Restructure charges (RCP, #376) scaled by the total assets (AT, #6) at t − 1
OSI	=	[Special items (SPI, #17) − Goodwill impairment losses (GDWLIP, #368) − Long-term assets write-downs (WDP, #380) − Restructure charges (RCP, #376)] scaled by total assets (AT, #6) at t − 1
TENURE	=	The number of years since the CEO assumed the office

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