GAAP Goodwill and Debt Contracting Efficiency: Evidence from Net-Worth Covenants*

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Abstract

We study the role of goodwill in promoting contracting efficiency and the effect of SFAS 141 and 142 on this role. We provide three main results. First, when a lending agreement contains some type of minimum-net-worth covenant, the probability of a tangible-net-worth covenant is decreasing in the borrower's goodwill. Second, the use of tangible-net-worth covenants has increased since the promulgation of SFAS 141 and 142. Finally, covenant slack is not significantly related to the use of tangible-net-worth covenants relative to net-worth covenants. These results suggest that contracting parties realize efficiency gains by permitting borrowers' actions to be restricted by the value of GAAP goodwill. However, the salutary effects of goodwill on contracting efficiency have been reduced due to recent changes in GAAP.

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1. Introduction

This paper studies the role of goodwill in promoting contracting efficiency. In particular, our research addresses two questions: (1) whether incorporating goodwill in debt covenants is efficient, and (2) how SFAS 141 and 142 have affected the contracting role of goodwill. Our research design differs from the extensive literature that examines the effects of existing debt covenants on accounting method choice and firm value (e.g., Defond and Jiambalvo, 1994, and Sweeney, 1994). This research looks for accounting and economic effects given pre-existing covenants. In contrast, we take an "ex ante" approach in that we assume covenants are not fixed. That is, we examine how the firm's existing accounting methods and mandatory changes in those methods shape covenants.[1] Assuming covenants reflect the value-maximizing choices of management (Smith and Warner, 1979), an "ex ante" approach allows us to understand the efficiency implications of accounting methods and accounting regulations.

Recorded goodwill affects contracting efficiency when lending agreements allow goodwill to restrict borrowers' actions. Restrictions can occur when a lending agreement has a net-worth covenant and the borrower's balance sheet contains goodwill. Under these circumstances, goodwill write-downs can lead to violation of the net-worth covenant or restrict the borrower's ability to pay dividends (Beatty and Weber, 2006). If allowing goodwill changes to trigger or relax restrictions on borrowers is not efficient,

[1] See Leftwich (1983) for an early paper that can be viewed as taking an "ex ante" approach.

the net-worth covenant can be rendered inert with respect to goodwill changes by using tangible net worth instead of net worth as the covenant benchmark. In particular, the substitution of tangible net worth for net worth will occur (1) if allowing GAAP goodwill to affect net-worth restrictions increases agency costs arising from the conflicting incentives of borrowers and lenders and (2) if additional negotiation, verification and record-keeping costs associated with excising goodwill are not significant.

With the release of SFAS 141 and SFAS 142, the Financial Accounting Standards Board shifted GAAP from amortization of goodwill to valuation of goodwill and, by eliminating the pooling method, increased the probability that acquirers will record goodwill in an acquisition. The FASB cited the need for "better information about intangible assets" as a reason for issuing SFAS 142, *Goodwill and Other Intangible Assets*. Yet, Watts (2006) argues that the GAAP value of goodwill is typically not verifiable, and that SFAS 141 and SFAS 142 are examples of the "soft accounting standards generated by standard setters" that will provide incentives for the creation of alternative accounting systems (e.g., Standard and Poor's "core earnings"). His argument implies that debt covenants will tend to exclude goodwill, because allowing goodwill to affect covenant restrictions increases agency costs. To support his point, Watts (2006) cites research by Leftwich (1983) who provides evidence that debt covenants exclude goodwill when measuring total assets. This debate provides the motivation for our examination of the use of goodwill in debt covenants.

We investigate the use of goodwill in contracting by studying whether lending agreements include a minimum-net-worth or a minimum-tangible-net-worth requirement, given that the borrower and lender have decided to include some type of net-worth

requirement in the lending agreement. We use the Dealscan database to identify firms that have net-worth covenants and tangible-net-worth covenants. The choice between these covenants depends on the relative net contracting benefits of these covenants. We find that the probability of a tangible-net-worth covenant is decreasing in the level of the borrower's goodwill. This result implies that lenders believe that goodwill is informative and provides an efficient means of limiting agency costs.[2]

Our study also provides insight into the effects of the adoption of SFAS 141 and SFAS 142 on the contracting role of goodwill. Because SFAS 141 and 142 were implemented simultaneously, our "before and after tests" are a test of the joint effects of these standards. We find that the use of tangible-net-worth covenants has increased since SFAS 141 and SFAS 142 came into effect. This result suggests that promulgation of SFAS 141 and SFAS 142 is associated with a reduction in the contracting efficiency of goodwill.

Comparing covenant slack associated with tangible-net-worth covenants and net-worth covenants provides additional evidence on the relative costs and benefits of tangible-net-worth and net-worth covenants. We measure covenant slack as the difference (scaled by total assets) between actual net worth in the fiscal year prior to initiation of the loan and the minimum net worth required by the loan. Increased covenant slack provides the lender with less control and can therefore increase moral hazard costs. However, reduced covenant slack increases the likelihood of covenant violation and can lead to increased renegotiation costs. We find that the level of covenant slack is not significantly related to the use of tangible-net-worth requirements. This

[2]Beatty et al., 2006 also find a negative relation between goodwill and use of tangible net worth covenants.

result suggests that these tangible-net-worth covenants and covenant slack are neither complements nor substitutes.

In sum, our results offer some support for both views in the debate over the role of goodwill in promoting contracting efficiency. Our evidence suggests that recorded goodwill provides a useful input to the firm's lending contracts. On the other hand, our results are consistent with the view that recent changes in goodwill accounting standards have reduced the net contracting benefits of goodwill.

Caveats. Our empirical models represent a reduced form of the underlying cost and benefit functions. Therefore, the interpretation of our results is limited. For example, we cannot identify the changes to specific costs associated with use of a tangible-net-worth covenant. We discuss costs and benefits to highlight plausible underlying trade-offs faced by borrowers and lenders. Our tests regarding the effects of SFAS 141 and SFA142 are subject to the caveat that the standard setting process is not modeled and therefore assumed to be exogenous. (see Wolfson, 1980).

2. Hypotheses development

In this section we develop our hypotheses on the choice between a net-worth and a tangible-net-worth covenant. We begin by discussing the role of minimum net-worth-based covenants, in general. We then turn to the role that goodwill plays in the choice between a net-worth covenant and a tangible-net-worth covenant, given that a net-worth-based covenant is selected. Next, we develop our hypothesis for the effects of SFAS 141 and SFAS 142 on the relative frequency of tangible-net-worth covenants. Finally, we discuss our hypothesis for the relative difference in covenant slack expected in tangible-net-worth compared to net-worth covenants.

2.1 Net-worth-based covenants

Net-worth-based covenants (or minimum-worth covenants) reduce the agency costs of debt in several ways. First, these covenants limit the exposure of lenders to the possibility of a liquidating dividend. The payment of dividends by the borrowing corporation transfers wealth from the lender to the borrower.[3] When the debt is nearly risk-free, these wealth transfers are negligible, but the conflict between lenders and borrowers with regard to dividends grows as the equity cushion supporting the debt declines. The borrower will also be less inclined to make the investments necessary to maintain assets because additional investments may eventually be used to pay the lender's claims, rather than providing returns to the borrower (Myers, 1984). By requiring a minimum level of shareholders' equity and periodically evaluating compliance prior to the repayment of his loan, the lender protects (and the borrower bonds) himself against liquidating dividends (Kalay, 1982).

Second, establishing a minimum level of worth provides the lender with a minimum level of security, or collateral value, in the event that the borrower defaults on the loan. A violation of a net-worth covenant provides advanced warning to the lender that the liquidation value of net assets is declining (Dichev and Skinner, 2002, and Smith, 1993). It also allows the lender to renegotiate the loan before further damage to the value of his collateral occurs.

Third, net-worth-based covenants reduce the borrower's incentive to increase the firm's asset-value variance. A higher variance increases the value of the call option

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[3] This discussion designates both managers and shareholders by the term "borrower." In so doing, we assume shareholders interests are aligned with managers in their dealings with lenders. However, incentive alignment can vary across firms (Begley and Feltham, 1999).

granted by the lender to the borrower (Galai and Masulis, 1976), but a higher variance also increases the probability of covenant violation and with it cancellation of the option prior to debt maturity. Thus, while the borrower gains option value by increasing variance, he loses option value by reducing option life.[4]

Finally, net-worth-based covenants reduce adverse selection arising from the information asymmetry between the lender and the borrower. A borrower can credibly convey his private information on the future prospects of his firm by accepting a covenant, because covenant violation is costly to the borrower. The costs arise because the lender can use his renegotiation option for private gains. For example, if market-wide interest rates have increased and a covenant is violated, the lender can choose to renegotiate even if there is little change in the borrower's default risk. Another example arises from the recent tendency of firms to delay their filing of financial statements due to increased reviews of option backdating practices. Several investors who bought long-term-public debt at prices below par value view these late filings as violations of debt covenants and demand either the immediate repayment of the debt or substantial fees to extend their default deadlines.[5] These examples illustrate how covenants create a valuable option for the lender that is costly to the borrower. Covenant violations can also be costly to the borrower because they can lead to additional burdens on management. For example, managers may be forced to supply updated financial statements or justify forecasts and strategies to borrowers (Dichev and Skinner, 2002). Therefore, by

[4] Minimum net-worth requirements are not unique in this respect. Any covenant whose requirements are linked to the performance of the firm and is evaluated prior to the maturity of the debt can reduce the borrower's incentives to increase variance by acting to shorten the expected life of the option.

[5] "Hedge funds play hardball with firms filing late financials", Wall Street Journal, August 29, 2006.

accepting costly covenants, borrowers credibly convey their private information with regard to the eventual violation of the covenant.[6]

In the discussion that follows, we assume that the benefits described above are provided by both tangible-net-worth and net-worth covenants. However, these benefits can vary across these covenant types. We discuss why these benefits are likely to vary as well as the other important incremental costs that can affect the net benefits provided by a given covenant type.

2.2 Tangible net worth vs. net worth

Given that the lender and borrower agree to include a minimum-worth requirement in the lending agreement, we now examine the benefits and costs of including a minimum-net-worth requirement versus a minimum-tangible-net-worth requirement. We argue that this choice is related to the current and expected amount of intangible assets in the firm's balance sheet, because the level of goodwill is an important determinant of the costs and benefits. In this discussion we analyze (1) contracting benefits arising from the expected correlation between reported goodwill and the value of the debt given moral hazard in the reporting decisions of managers, (2) the incremental expected implementation costs, which include initial negotiation and monitoring costs of a tangible–net-worth requirement over a net-worth requirement, and (3) the incremental expected renegotiation costs of a net-worth requirement over a tangible-net-worth requirement in case of a covenant violation.

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[6] Smith (1993) notes that lenders may eschew opportunistic use of this renegotiation option to attract future borrowers. If so, this would reduce the value of the renegotiation option and thereby limit its usefulness as a screening mechanism.

Comparing Incremental Benefits Debt covenants provide efficiency gains, by reducing moral hazard and adverse selection arising in the relations between borrowers and lenders. Covenants alert the lender to borrower actions that simultaneously increase the borrower's expected payoffs and reduce the value of the lender's claim (Smith and Warner, 1979). More importantly, when covenants are violated, the lender is granted specific rights, such as demanding repayment. In this way, covenants mitigate potential lender/borrower conflicts, reducing contracting costs associated with borrowing and increasing the value of the firm.

Conflicts between borrowers and lenders become more pronounced when the default probability is higher. Given that incentive conflicts become more pronounced as the lender's expected payoff declines, the lender will use covenants to monitor credit quality and to gain additional rights when credit quality deteriorates. We assess the relative benefits of tangible-net-worth and net-worth covenants in light of their usefulness in monitoring the lender's expected payout and therefore their ability to increase the efficiency of the lending agreement.

A lender's expected payoff depends on the value of the firm relative to the promised payment on the debt and the expected payoff in the event of default. To the extent that goodwill provides additional information about the lender's expected payoff it provides monitoring benefits. For example, the write-down of goodwill can indicate that the value of the firm is approaching the promised payment on the debt. In this case, including a net-worth rather than a tangible-net-worth covenant improves monitoring efficiency because it allows the reduction of goodwill to influence the covenant.

On the other hand, if goodwill value is uncorrelated with firm value and goodwill has no value in bankruptcy, it would be inefficient to include goodwill in debt covenants. Allowing a goodwill write-down to create additional lender rights, results in a potential obligation to the borrower with no offsetting *ex ante* reduction in moral hazard or adverse selection. If creating these rights is costly, then a lending contract using a net-worth requirement will be less efficient that a lending contract using a tangible-net-worth requirement. If a tangible-net-worth covenant provides a less noisy measure of the lender's expected payoff and avoids the costs associated with the arbitrary and costly creation of lender rights it would offer incremental benefits.

Comparing Incremental Costs Two costs arise from the process of administering debt covenants. The first is the cost of implementing the contract.[7] We argue that the costs of implementing a tangible-net-worth covenant can be higher than those of a net-worth covenant. The initial negotiations surrounding the computation of a non-GAAP term are likely to be more complex than those associated with negotiating GAAP terms. There is cross-sectional variation in the definition used in covenants for tangible net worth suggesting that a widely accepted definition does not exist and that incremental negotiation costs can arise. For example, some contracts include unrealized gains on securities in the definition of intangible assets while other contracts do not. This variation can increase the cost of monitoring these covenants by forcing lenders to check covenant terms and alter their computations for each contract. Moreover, some companies do not clearly demarcate intangible assets on their balance sheet. For example in Intel's 2005 annual report, one must go to the footnotes to find the company has

[7] We use the term "implementation costs" to include both the costs of the initial negotiation of the covenant as well as the ongoing monitoring of the covenants.

$654M of "identified intangible assets." On the balance sheet one only finds a line item for "Deferred taxes and other assets." Thus, removing intangible assets is not a mechanical process. Ultimately, the importance of these incremental monitoring and negotiation costs is an empirical question. The results of El-Gazzar and Pastena (1990) suggest that non-GAAP covenant terms are more costly to negotiate and monitor than GAAP covenant terms. They find that the exclusion of goodwill and other intangibles from equity is less likely in bank loans than in loans granted by insurance companies. The former are more likely to be syndicated, increasing the costs of monitoring or negotiating tailored accounting.

The second administrative cost is the expected cost of renegotiating a loan when a covenant is violated. Expected renegotiation costs are increasing in the probability that a covenant will be violated. When firms have goodwill we argue that the expected renegotiation costs of a net-worth covenant are higher than those of a tangible-net-worth covenant, because a goodwill write-off increases the probability that a net-worth covenant will be violated but does not affect the probability of violating a tangible-net-worth covenant (Beatty and Weber, 2006).[8]

Comparing Incremental Costs and Benefits Given neither covenant provides higher costs and lower benefits in all circumstances the choice between covenant reflects the maximization of net benefits. The above discussion suggests that the incremental monitoring costs of a tangible-net-worth covenant exceed those of a net-worth covenant.

[8] This assumes that the slack in net-worth covenants is not set higher than in tangible-net-worth covenants to decrease the likelihood of covenants violation. We investigate whether covenant slack varies between tangible-net-worth and net-worth covenants. We find that the median slack in contracts that contain net-worth (4.9%) is significantly lower than the slack used in contracts with tangible-net-worth covenants (7.2%).

Thus, the use of a tangible-net-worth covenant implies that this incremental cost is offset by the contracting benefits. On the other hand, the use of a net-worth covenant suggests either (1) that the incremental costs of a tangible-net-worth covenant are prohibitive or (2) that allowing goodwill to influence the occurrence of a covenant violation provides contracting benefits that exceed the incremental costs associated with a net-worth covenant.

In summary, we expect the relation between the magnitude of goodwill and the incidence of tangible-net-worth covenants to depend on the relative costs and benefits of each type of covenant. If goodwill provides no information about either collateral value or the probability of default then we expect a positive relation between the probability of a tangible-net-worth covenant and goodwill. In this case, goodwill adds noise to the covenant and the negative effects of this noise are increasing in the amount of goodwill. For example, more goodwill implies that goodwill write-offs are more likely to lead to technical default, leading to higher expected renegotiation costs. Therefore, as the value of goodwill increases, benefits to removing this noise increase. Assuming the costs of removing goodwill rise less sharply than the benefits of removing goodwill, we expect the probability of a tangible-net-worth covenant to increase in the level of goodwill. If, on the other hand, goodwill is correlated with the lender's expected payout, a negative relation between the use of tangible-net-worth covenants and the magnitude of goodwill is possible. In this case, the benefits foregone from the removal of goodwill (e.g., using a tangible-net-worth covenant) are increasing in the magnitude of goodwill. When goodwill is a small percentage of total assets, a covenant can ignore changes in goodwill without materially affecting contracting efficiency. However, as goodwill grows

ignoring the value of goodwill significantly reduces the correlation between the covenant benchmark and the lender's expected payout. This discussion leads to the following two-sided null hypothesis

> **H1: There is no relation between the magnitude of recorded goodwill and the propensity of a firm to use a tangible-net-worth rather than a net-worth requirement in its lending agreements.**

2.3 SFAS 142 and SFAS 141 and the propensity to use tangible-net-worth covenants rather than net-worth covenants

SFAS 142 According to SFAS 142, goodwill has an indefinite life and therefore should not be amortized. SFAS 142 thereby alters prior GAAP which required goodwill to be amortized over a period not exceeding 40 years.[9] Under SFAS 142, goodwill is written down when it is impaired.[10] While goodwill write downs could occur under prior GAAP, SFAS 142 gives write downs significantly more prominence by eliminating amortization and by requiring a formal test for determining impairment. Moreover, SFAS 142 requires managers (and their auditors) to engage in the subjective practice of business unit valuation. If SFAS 142 increases the frequency of goodwill write offs (and thus increases expected renegotiation costs associated with net-worth covenants) without an offsetting increase in the benefits derived from improved correlation between goodwill carrying values and the expected payoff to lenders, then we would expect an increase in the use of tangible-net-worth covenants relative to net-worth covenants after the implementation of the standard. If, on the other hand, the specific guidance provided by

[9] SFAS 142 must be applied in fiscal years beginning after December 15, 2001. Prior GAAP was derived from Accounting Principles Board Opinion No. 16 Business Combinations (APB 16).
[10] See Kieso, et al., 2004, for details.

SFAS 142 for a substantive test of goodwill impairment increases the relevance of reported goodwill, its adoption can lead to an increase in the use of net-worth covenants.

SFAS 141 The accounting procedures used for acquisitions also have implications for the choice between tangible-net-worth covenants and net-worth covenants. By proscribing use of the pooling method to account for acquisitions, SFAS 141 alters expected accounting procedures and can thereby change the frequency of tangible-net-worth covenants relative to net-worth covenants. The usual argument is that the purchase method lowers income by requiring amortization of goodwill. Therefore, firms seeking to relax pre-existing debt covenants will prefer the pooling method (e.g., Aboody et al., 2000, Ayers et al., 2002, and Weber, 2004). However, this argument assumes that the only metric that concerns firms with debt covenants is reported income. This argument may not apply to firms that have pre-existing net-worth covenants.[11] When the fair market value of the target's net assets exceeds the book value of net assets, an acquisition accounted for under the purchase method adds this difference to the shareholders' equity of the acquirer. The difference between the book value of net assets and their market value is not added to shareholders' equity when the pooling method is used. Thus, a purchase-method acquisition has a greater potential to loosen net-worth covenants than a pooling-method acquisition.

The incremental relaxation of the net-worth covenant associated with a purchase method acquisition is not accompanied by a strengthening of the lenders position. Cash-based acquisitions allow firms to distribute cash to target shareholders without affecting net worth. Moreover, when the acquisition gives rise to goodwill, an intangible asset

[11] Nor does this argument apply to most coverage-based covenants, because those covenants are often computed using earnings before depreciation and amortization is deducted.

displaces one with higher collateral value—cash—further weakening the security of pre-existing debt. Therefore, a cash-based acquisition can reduce the expected value of the lender's claim without violating a net-worth requirement. In a stock-based purchase-method acquisition, shareholders' equity increases thereby adding slack to the net-worth covenant. However, a potentially large portion of the added shareholders' equity is related to the write-up of assets and goodwill. Both sources have questionable collateral value. In this way, purchase-method acquisitions can impair the ability of a pre-existing net-worth requirement to reduce moral hazard and adverse selection costs.[12]

A tangible-net-worth requirement limits the ability of an acquisition to undermine net-worth requirements. Goodwill arising from a stock-based purchase-method acquisition does not add slack to the covenant while goodwill acquired in a cash-based acquisition leads to tighter covenants. Lenders and borrowers will anticipate the effects of expected future acquisitions on net-worth covenants when they negotiate lending agreements. Therefore, we expect the link between the use of tangible-net-worth requirements and acquisitions to strengthen after SFAS 141, given SFAS 141 rules out the use of pooling and thereby increases the probability that goodwill will arise in an acquisition.[13]

In sum, both SFAS 141 and SFAS 142 could lead to an increase in the use of tangible-net-worth covenants. Both these standards affect financial statements in fiscal

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[12] Faced with the possibility of future acquisitions by the borrower, parties can agree to require lender approval of all acquisitions. However, this alternative is costly when future information asymmetry between borrowers and lenders gives rise to renegotiation costs (e.g., Myers and Majluf, 1984, Myers, 1984). Moreover, when bonds are selling below par, such covenants give lenders the opportunity to force borrowers to compensate them for allowing acquisitions that do not adversely affect the value of the lenders' claims.

[13] SFAS 141 provisions must be applied to business combinations initiated after June 2001.

2002 and beyond. Given their effects coincide we do not attempt to distinguish between these standards. Instead we test their joint effect. Our hypothesis is as follows:

> **H2: The propensity of a firm to use tangible-net-worth instead of net-worth requirements in its lending agreements is unchanged by the promulgation of SFAS 141 and SFAS 142.**

2.4 Covenant slack in tangible-net-worth covenants and net-worth covenants

We define covenant slack as the difference between the reported net worth (or tangible-net worth) of the company at the end of the fiscal year prior to the loan's origination and the threshold level of net worth (or tangible-net worth) that the firm must maintain to comply with the covenant. Lenders and borrowers can use slack to control the contracting costs.

The choice of slack is a function of two costs. First, increasing slack reduces the covenant's ability to serve as an early warning device. More slack allows the borrower to transfer more wealth from the lender prior to covenant violation. If goodwill is less reliable and verifiable than other assets or if a net-worth covenant can be relaxed by future purchase-method acquisitions, then the marginal agency cost for one unit of slack is higher for a net-worth covenant than for a tangible-net-worth covenant.

The second cost affected by slack is renegotiation cost. Renegotiation costs are a function of the probability of a covenant violation. A covenant with less slack is more likely to be violated and, thus, is associated with higher expected renegotiation costs. In section 2.2 we argue that the probability of covenant violation can be reduced by using a tangible-net-worth requirement. This argument suggests that, ceteris paribus, tangible-net-worth covenants can achieve a given level of renegotiation costs with less slack and therefore will be associated with less slack than net-worth covenants. In other words, for

a given level of slack, net-worth covenants are more likely to be violated and therefore have higher expected renegotiation costs.

In summary, incremental renegotiation and moral hazard costs will likely have differing effects on the preference for slack in tangible-net-worth covenants compared to net-worth covenants. Agency-cost considerations argue that tangible-net-worth covenants should have higher slack, while renegotiation-cost considerations suggest that net-worth covenants should have higher slack. Whether we observe more slack in tangible-net-worth covenants depends on the relative importance of these considerations. We note that the choice of covenant type and amount of slack is likely simultaneous. Therefore, we use instruments to proxy for the type of net-worth covenant. Our hypothesis stated in null form is as follows:

H3: The slack found in net-worth covenants is similar to the slack observed in tangible-net-worth covenants.

3. Method

We test H1 and H2 by estimating the following logistic model:

$$\begin{aligned} TNW = {} & \alpha + \beta_1 * GW + \beta_2 * GW\_ZERO + \beta_3 * OTH\_INTANG + \\ & \beta_4 * RATING\_EXIST + \beta_5 * RATING + \beta_6 * ACQ + \beta_7 * MATURE + \\ & \beta_8 * SYNDICATE + \beta_9 * POST + \beta_{10} * EBITDA\_COV + \\ & \beta_{11} * NON\_EBITDA\_COV + \beta_{12} * OTHER\_COV + \beta_{13} * YIELD + \\ & \beta_{14} * LNSIZE + \beta_{15} * BM + \beta_{16} * LEV + \beta_{17} * ROA + \beta_{18} * LOSS + \\ & \beta_{19} * UNREAL\_GAIN, \end{aligned} \quad (1)$$

where, *TNW* is an indicator variable equal to one if a debt facility contains a tangible-net-worth covenant and zero if the facility contains a net-worth covenant. Tangible-net-

worth covenants are identified using the coding provided in the DealScan database. We estimate our model using a logit procedure.[14]

Our main interest lies in the sign of the coefficient on *GW*, β_1 which tests H1. *GW* is equal to goodwill as a percentage of total assets.[15] We expect the magnitude of other intangible assets (*OTH_INTANG*) to be associated with a tangible-net-worth requirement in the same way as goodwill. Tangible-net-worth definitions found in covenants occasionally add back unrealized gains on securities. Therefore, we include unrealized gains as a control variable (*UNREAL_GAIN*). We include several other variables to shed light on the costs and benefits associated with the choice between a tangible-net-worth and a net-worth covenant. The value of acquisitions in the 2-digit SIC code group of the borrower relative to the market capitalization of firms in that group in the year prior to the lending agreement is used as a proxy for expected acquisitions at the loan date (*ACQ*). We expect the anticipated level of future acquisitions, to be associated with the existence of a tangible-net-worth covenant based on the argument that future acquisitions add slack to net-worth covenants while not necessarily increasing the lender's expected payout. The costs of implementing a tangible-net-worth covenant are positively associated with the size of the syndicate (El-Gazzar and Pastena, 1990). Thus, we expect a negative association between the size of the syndicate (*SYNDICATE*) and the existence of a tangible-net-worth covenant. To control for self-selection in the use of net-

[14] See Table 6 for a detailed description of the variables.

[15] To account for potential non linearity in the relation between goodwill and debt covenants, we also include an indicator variable (*GW_ZERO*) which equals one if the firm has no goodwill on the balance sheet in the year prior to the initiation of the loan. Results are qualitatively similar when goodwill is measured as log of (*1+GW*).

worth-based covenants, we also check the robustness of our results to the use of a Heckman-two-stage procedure.

In H2 we investigate whether the adoption of SFAS 141 and 142 is associated with the likelihood of including a tangible-net-worth covenant in lending agreements. To test this hypothesis, we include in equation (1) an indicator variable, *POST*, equal to one for loans originated in 2002 and thereafter. If SFAS 141 and 142 have reduced the usefulness of goodwill in lending agreements either by increasing renegotiation costs or increasing agency costs, we expect tangible-net-worth covenants will be chosen more often and the coefficient on *POST* to be positive.

We also include as controls the yield spread of the loan (*YIELD*) and indicator variables for the existence of other covenants. Both yield spread and other covenants can serve as substitutes or complements to the use of tangible-net-worth covenants. We group the other covenants into three types: covenants based on earnings before interest, taxes, depreciation and amortization (EBITDA), covenants that are based on non-EBITDA numbers, and other covenants. Other covenants can act as correlated-omitted variables if they are substitutes or complements for tangible net worth covenants. For a complete description of the covenants groups, refer to Table 6.

Other variables such as size, book-to-market, leverage, debt ratings, return on assets, and maturity are included because they are related to the agency costs of debt and thus can be related to the preference for tangible-net-worth covenants. The agency costs of debt are hypothesized to increase in firms' growth prospects because managers have more opportunities to increase the variance of their assets and thus transfer wealth from debt-holders to shareholders (Smith and Watts, 1992 and more recently, Billet et al.

2005). Thus, we anticipate a negative correlation between agency costs and the book-to-market ratio. Because the use of tangible-net-worth covenants can be efficient when agency costs are high, book-to-market could act as a correlated omitted variable in our regressions. Similar arguments can be made for measures of the firm's financial health. The coefficient on loan characteristic variables such as *SYNDICATE*, and *MATURE*, should be interpreted with caution because these variables are likely chosen simultaneously with the covenants.

To address H3 and investigate the association between the degree of slack allowed in minimum-worth covenants and the type of covenants used, we estimate the following model:

$$\begin{aligned} SLACK = \alpha + \beta_1 * TNW + \beta_2 * GW + \beta_3 * GWZERO + \beta_4 * OTH\_INTANG + \\ \beta_5 * RATING\_EXIST + \beta_6 * RATING + \beta_7 * ACQ + \beta_8 * POST + \\ \beta_9 * MATURE + \beta_{10} * SYNDICATE + \beta_{11} * LNSIZE + \beta_{12} * BM + \\ \beta_{13} * LEV + \beta_{14} * ROA + \beta_{15} * LOSS + \beta_{16} * UNREALIZED\_GAIN, \end{aligned} \quad (2)$$

where *SLACK* is computed as the actual level of net worth (or tangible-net worth) minus the level of net worth (or tangible-net worth) stated in the covenant, all divided by total assets.

4. Data and Results

4.1 Data

We obtain our sample from the Dealscan database available from the Loan Pricing Corporation between 1992 and 2003.[16] Financial statement data is obtained from Compustat. Acquisition data is obtained from the Securities Data Corporation database.

[16] As a robustness analysis and to check the validity of the DealScan data, we construct an alternative sample. The nature of this sample and its results are reported in section 4.4.

Table 1 outlines our sample selection filters. We begin with 28,448 debt facilities that are available in the Dealscan database. We exclude 3,468 facilities that could not be matched to Compustat as well as 4,480 facilities that do not have sufficient information to compute the variables used in our tests. Next, we exclude facilities of firms with negative book values. [17] Finally, we exclude all facilities that do not contain a net-worth or a tangible-net-worth covenant. Our final sample consists of 4,096 facilities obtained from 1,662 unique firms.

4.2 Summary statistics

Table 2 reports summary statistics for our sample.[18] Our sample contains slightly more facilities with tangible-net-worth covenants (52.6%) than with net-worth covenants (47.4%). The market capitalization (*SIZE*) of our sample firms averages $1.5 billion but is skewed with a median of $250 million. Goodwill (*GW*) constitutes about 6% of total assets, on average, but more than 50% of the sample firms have no goodwill on their balance sheet. About 19% of sample firms reported losses in the year prior to originating loan facilities (*LOSS*). About 27% of the observations in our sample have a non-missing bond rating (*RATING*) in Compustat, and of those, 41.5% have an investment-grade bond rating. The median term (*MATURE*) of the loans in our sample is about 36 months (natural log equal to 3.58) and the median number of lenders is approximately three.

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[17] We identified 70 observations that include a tangible-net-worth or a net-worth covenant and had a negative book value. We manually examined these observations. In 40% of the observations, the covenant threshold is negative at the inception of the loan. About 75% of the observations seem to be in violation at inception. We exclude these observations from our estimations because they confound our attempts to control for growth-opportunities, a major factor affecting the agency costs of debt.

[18] Please refer to table 2 for precise definitions of the variables.

Table 3 reports univariate correlations between several variables of interest. These estimates indicate that the incidence of a tangible-net-worth covenant is negatively associated with the magnitude of goodwill and other intangible assets. Consistent with El-Gazzar and Pastena (1990), we find that tangible-net-worth covenants are less likely to be used as the number of lenders increases (*SYNDICATE*). This result suggests that tangible-net-worth covenants are associated with higher implementation costs. The negative correlation between the existence of a tangible-net-worth covenant and *RATING* also indicates that tangible-net-worth covenants are more likely to be used as default risk increases. A tangible-net-worth covenant is more likely to be chosen over a net-worth covenant when ROA is low. These results are consistent with the argument that tangible-net-worth covenants are more likely to be used when an increased risk of default focuses the lender's attention on the collateral value of assets and magnifies agency concerns.

Table 4 reports frequency of our sample debt facilities across years during our sample period. The first three years in our sample period (1992-1994) contain very few observations. Starting in 1995, the number of observations is fairly evenly distributed across years. The final year, 2003, contains slightly fewer observations. The results do not indicate a pronounced time-trend in the relative use of tangible-net-worth versus net-worth covenants.

Table 5 reports the frequency of debt facilities across 14 industry groups. We combine several SIC code groups into broad industry groups based on the economic similarity of firms. We use these industry categories as control variables in our

regression analysis.[19] As can be seen in Table 5, we find considerable cross-sectional variation in the relative use of tangible-net-worth covenants across industries. For example, 82.8% of loan facilities associated with the mining & construction industry use tangible-net-worth requirements, compared with only 25.8% of facilities associated with the chemicals industry. This variation suggests that our industry classification captures underlying variation in factors related to the use of tangible-net worth covenants. However, multivariate tests are necessary to assess whether this explanatory power is incremental to other firm-specific controls.

4.3 Tests of hypotheses one and two

The results of our investigation of the relation between the level of goodwill and the probability of observing a tangible-net-worth covenant are shown in Table 6, where we estimate several versions of equation (1). Recall that this relation is expected to be positive if lenders are mainly interested in the collateral value of the assets, if goodwill does not provide any significant indication of the lenders' expected payoff, and if the incremental implementation costs of a tangible-net-worth covenant are not prohibitive. This relation is expected to be negative if goodwill is correlated with the value of debt and thus, write-offs are expected to be meaningful events to the lenders. In Table 6 we report clustered standard errors (by firm) to mitigate independence problems from multiple observations per firm (see Petersen, 2005).

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[19] We also used the 48 industry groups as proposed by Fama and French (1997), with no qualitative change in the conclusions of the study. The use of 48 industry groups significantly reduces the power of our tests given the large number of industries relative to our sample size. We find a reduction in the significance of some of our control variables. Our use of a smaller number of industries reflects an attempt to develop an empirical model with sufficient power while, at the same time, providing meaningful industry controls.

In Model 1 of Table 6, we present results from a logistic estimation, which excludes variables that relate to the characteristics of the loan (*MATURE* and *SYNDICATE*) and the effective date of SFAS 141 and 142 (*POST*). We find that the level of goodwill in the fiscal year prior to the lending agreement (*GW*) is negatively associated with the probability of including a tangible-net-worth covenant. This result is consistent with recorded goodwill being correlated with the lender's expected payoff. The implied positive association between the preference for net-worth covenants and the magnitude of goodwill is consistent with lenders believing that goodwill levels are informative and an efficient means of limiting agency costs. Similarly, intangible assets other than goodwill (*OTH_INTANG*) are also negatively associated with the incidence of a tangible-net-worth covenant.

The variables associated with bond rating do not appear to be associated with the incidence of a tangible-net-worth covenant. *ACQ* has a positive, marginally significant association with the likelihood of a tangible-net-worth covenant. This result is consistent with the discussion in section 2.3 which argues that future acquisitions loosen net-worth covenants rendering them less effective than tangible-net-worth covenants for controlling agency costs.

In Model 2, we add variables related to characteristics of the loan facility. Results discussed for Model 1 also hold for our variables of interest in Model 2. The number of lenders (*SYNDICATE*) is negatively associated with the incidence of a tangible-net-worth covenant, which is consistent with a tangible-net-worth covenant being more costly to negotiate and monitor. In addition, the length of the loan (*MATURITY*) is negatively associated with the incidence of a tangible-net-worth covenant. This result holds for all

specifications and is surprising given that agency costs would seem to be positively related to maturity (Billet et al, 2005). As maturity increases the lender's need for an "early-warning" device is increased. Alternatively, this result suggests that tangible-net-worth covenants and maturity are complementary mechanisms for controlling agency costs. That is, high agency costs lead to reduced maturity and an increased use of tangible net worth covenants. This explanation implies that maturity and covenant type are jointly determined. Given the potential for endogeneity in the relation between facility-specific characteristics (i.e, maturity, syndication and other covenants) and the use of tangible net-worth covenants, these coefficients should be interpreted with caution. Facility specific characteristics are included to assess the robustness of our estimates on experimental variables *GW* and *POST*.

In Model 3, we add an indicator variable, *POST*, which is equal to one after the effective date of SFAS 141 and 142 to examine whether these goodwill standards affect debt contracts. If these standards reduce the usefulness of goodwill in contracts, we should observe an increase in the likelihood of including a tangible-net-worth covenant in debt contracts originated after the adoption of SFAS 141 and 142 and the coefficient on *POST* will be positive. The results from Model 3 are consistent with this interpretation. We find that the indicator variable, *POST*, is positive and significant. That is, the incidence of tangible-net-worth covenants has increased in the years following the adoption of SFAS 141 and 142, controlling for other economic determinants of the covenants.[20]

[20] In an alternative specification, which we do not report, we added an interaction variable to examine whether the slope coefficient on GW is different in the period after the new standards. We find no evidence of a difference while the other results remain unchanged.

In Model 4 we add three indicator variables to control for other covenants that are included in the debt contracts. The first indicator variable equals one if the debt contract contains EBITDA-based covenants. The second indicator variable equals one if the debt contract contains non-EBITDA-based covenants. The third indicator variable equals one if the debt contract contains other types of covenants. For a full list of covenants, please refer to Table 6. We also add the variable YIELD, which measures the cost of the loan over LIBOR. We include these variables to investigate whether our main result is sensitive to controlling for other terms of the loan including pricing and other covenants. The pricing of the loan and inclusion of other covenants are jointly determined with other features of the contract, including the existence of a tangible-net-worth covenant. Therefore, we are reluctant to interpret these coefficients. After including these variables, the GW variable continues to be negatively associated with the incidence of tangible-net-worth covenants.

The sample included in Models 1-4 is restricted to facilities that contain minimum-worth covenants. Coefficient estimates will be biased if sample selection is associated with the independent variable of interest, because such an association implies that the error term is correlated with the independent variable. To address this concern we estimate a two-stage Heckman procedure and report its results in Table 7. In the first stage, we model the incidence of a minimum-worth covenant as a function of several firm characteristics. We estimate the first stage on all firms with lending agreements available in the Dealscan database and with sufficient information to compute all variables in the first stage (14,148 observations). The pseudo-R^2 from the first stage estimation is 6.7%, suggesting that we have difficulty controlling for the sample-selection bias. However,

the coefficient on *GW* is insignificant suggesting that the magnitude of goodwill is not related to the selection of minimum-worth requirements.

In the second stage, we estimate Model 3 including the inverse-Mills ratio from the first stage. The coefficient on the inverse-Mills ratio is insignificant. The negative (positive) relation between goodwill (*POST*) and the incidence of a tangible-net-worth covenant is robust to the Heckman procedure.

4.4 An alternative sample

To investigate the sensitivity of our results to the use of Dealscan data, we employ an alternative sample. To construct the alternative sample, we search 10-K filings for firms whose debt contracts included net-worth and tangible-net-worth covenants during the years 1998-2002. Our search included the following keyword searches:

1. The tangible net worth sample (628 observations): Maintain (near5) “tangible net worth”
2. The net-worth sample (618 observations): Maintain (near5) “net worth” (not) “tangible net worth”

Our final alternative sample, with sufficient information to run our regression models, contains 863 observations – 422 with net-worth covenants and 441 with tangible-net-worth covenants.

Overlap between the two samples. The final Dealscan sample contains 4,096 facilities with sufficient information to estimate the regression models. Of those, 169 facilities (of 118 different firm-years) are shared with the alternate sample. Thus, of the 843 observations in the alternate sample, about 20% are shared with the Dealscan sample.

For the 169 observations that are common between the two samples, we find agreement between the two samples with regard to the classification of net-worth-covenant type in 143 cases. These results suggest an estimated upper bound for the potential error rate in the Dealscan data set is approximately 15%.

We inspect the 26 cases where Dealscan's and the alternate sample's net-worth-covenant classifications disagree. We find that in 18 cases, the classification of our alternate sample was correct, in 2 cases the classification in Dealscan was correct and in 6 cases we could not determine which source is correct.

In unreported results, we find that the firms in the alternate sample are smaller (in terms of total assets and sales). We find no significant differences in the levels of goodwill or leverage between the firms in the two samples. Thus, we conclude that Dealscan is likely to include larger firms in its database.

Results using the alternative sample. In Table 8 we report the results of estimating our basic model 1 using the alternate sample. We cannot estimate more complete versions of the models using the alternate sample because we do not have information on maturity, the number of lenders and other covenants for this sample. For comparison purposes, we also report the results from the Dealscan sample (previously reported in Table 6). While the alternate sample has significantly fewer observations, the coefficient on GW remains negative and significant. Interestingly, we find that firms for which bond ratings exist on Compustat (presumably firms with public debt) are less likely to include a tangible-net-worth covenant in their contracts. Also, we find that given the existence of a debt rating, firms with higher ratings are more likely to be associated with a tangible-net-worth covenant.

Finally, the last columns in Table 8 report the results of an observation-independence robustness test in which we estimate model 3 from Table 6 limiting each firm in the sample to only one randomly-chosen debt facility. The number of observations in this specification falls to 1,511. The results for H1 regarding goodwill do not change as a result of this estimation. However, the coefficient on *POST* is no longer significant.

4.5 Test of hypothesis three

The results of our investigation of the association between the degree of slack allowed in minimum-worth covenants and the type of covenants used are reported in Table 9. We estimate two versions of equation (2). The dependent variable, *SLACK,* is computed in two ways: (i) In Model 1 slack is computed as the actual level of net worth (or tangible-net worth) minus the level of net worth (or tangible-net worth) stated in the covenant, all divided by total assets, (ii) In Model 2 slack is computed as the natural logarithm of the actual level of net worth (or tangible-net worth) divided by the level of net worth (or tangible-net worth) stated in the covenant. In both models, we exclude observations where *SLACK* is negative because these observations have a greater likelihood of containing data errors.[21] Because slack, the type of net-worth covenant, and other debt facility features (e.g., the number of lenders and maturity) are likely to be jointly determined, we use instruments to isolate the portion of the independent variables that is pre-determined. In particular, we define *TNW*, *SYNDICATE* and *MATURE* as the

[21] The results for the sample reported in Table 9 appear to be more powerful because many variables, including control variable, turn significant once the observations with negative *SLACK* are excluded. The coefficient on TNW remains insignificant when models are estimated on a sample that includes negative slack observations.

averages of all other facilities originated in the same year in the firm's industry-group. In both models, we find evidence that slack is increasing in situations where agency costs are reduced. The coefficient on *RATING* is positive indicating that higher rated debt is associated with more slack. In addition, the facilities of larger firms are associated with more slack. However, we do not find evidence supporting the hypothesis that the level of slack chosen in a debt contract is related to the type of minimum-worth covenant. In Model 1, the coefficient on TNW is not significant. This result is robust to the alternative definition of slack used in Model 2.

5. Conclusion

We study how the magnitude of goodwill and how changes in goodwill accounting rules relate to the choice of minimum-net-worth covenants. We take an "ex ante" view of covenants in that we treat covenants as a choice that is shaped by accounting procedures and accounting regulations. We also assume that covenant terms are chosen to maximize contracting efficiency. These assumptions imply that lenders and borrowers will not allow covenants to be affected by an accounting number if the number can be excluded at minimal cost, and if including the number would lead to the arbitrary and costly reallocation of rights between the contracting parties. Therefore, by studying whether an accounting number is allowed to affect covenant terms, we gain insight into the contracting role of that number as well as the costs of excluding it from the contracts. Moreover, by studying how the contracting use of a number changes around a change in accounting standards, we understand how the accounting standard affects contracting efficiency.

We investigate how the magnitude of goodwill relates to whether a lending agreement includes a net-worth covenant or a tangible net-worth covenant. We also examine whether the adoption of SFAS 141 and SFAS 142 is associated with a change in the propensity to use of tangible-net-worth covenants. The choice between these covenants depends on the relative implementation and renegotiation costs as well as the agency benefits associated with each of these covenants. We conjecture that the relative agency benefits of a tangible-net-worth covenant and a net-worth covenant depend on the correlation between goodwill and the borrower's expected payout. If this correlation is non-existent, a tangible-net-worth covenant provides incremental agency benefits by reducing noise and opportunism associated with the covenant. We expect that these costs and benefits vary with goodwill. Hence, investigating the level of goodwill in relation to these alternative covenants provides insight into whether goodwill accounting aids or reduces contracting efficiency.

We find that the probability of a tangible-net-worth covenant is decreasing in the level of the borrower's goodwill. This result suggests that the level of goodwill is informative and provides an efficient way of limiting agency costs. The result also suggests that the collateral value of assets is not the sole factor determining the net-worth-covenant type.

We also investigate changes in the choice of net-worth-covenant type after the adoption of SFAS 141 and SFAS 142. We argue that if the adoption of these standards reduced the salutary affect of goodwill on contracting costs, we would expect an increased use of tangible-net-worth covenants subsequent to adoption. Indeed, we find some evidence that the use of tangible-net-worth covenants has increased since the

adoption of SFAS 141 and SFAS 142, after controlling for other economic factors. This result implies that these standards have reduced the contracting usefulness of goodwill.

Finally, we investigate the covenant slack associated with tangible-net-worth and net-worth covenants to gain further insight into the costs associated with these covenants. We find that the magnitude of covenant slack is not significantly related to the use of tangible-net-worth covenants relative to net-worth covenants. Therefore, tangible-net-worth covenants appear to be neither a complement or substitute for slack.

Our investigation is an initial step in understanding the contracting costs and benefits of goodwill. Our empirical models represent a reduced form of the underlying cost and benefit functions. Therefore, the interpretation of our results is limited. Future research could attempt to better isolate measures of the underlying costs and benefits and provide a richer analysis of the trade-offs faced by the borrower and lender given existing accounting standards and firm characteristics.

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Table 1

Sample Selection

The sample of lending agreements is drawn from the Dealscan database provided by the Loan Pricing Corporation. The sample includes facilities from 1992-2003.

Number of facilities on Dealscan		28,448
Less facilities that cannot be matched to Compustat	3,468	
		24,980
Less facilities that do not have Compustat data for variables used in subsequent tests	4,480	
		20,500
Less facilities of firms with book values less than zero	781	
		19,719
Less facilities that do not have net-worth-type covenants	15,623	
Final Sample		4,096

Table 2

Descriptive Statistics

Variable (*N*=4,096)	Mean	Median	Std Dev	Min.	Max.
TNW	0.526	1	0.49	0	1
SIZE	1,537.9	250.3	6,936.2	0.268	139,092.7
BM	0.82	0.52	8.06	0.001	514.9
ASSETS	2,310.5	305.7	18,086.9	1.26	668,641
Total Equity	535.6	127.8	1,937.8	0.283	40,395
ROA	0.02	0.04	0.15	-3.49	0.37
ACQ	0.433	0	0.495	0	1
LEV	1.74	0.66	30.17	0.00	1,925
GW	0.06	0	0.11	0	0.71
OTH_INTANG	0.005	0	0.03	0	0.57
LOSS	0.19	0	0.39	0	1
RATING (N=1111)	0.415	0	0.492	0	1
MATURE	3.48	3.58	0.71	0	5.48
SYNDICATE	1.23	1.09	1.12	0	4.61
SLACK (N=3,846)	-0.369	0.062	7.749	-253.5	0.826
SLACK (N=3,012)*	0.125	0.085	0.125	0.000	0.826

Variable Definitions:

TNW is equal to 1 if the firm has a tangible-net-worth covenant and zero if the firm has a net-worth covenant.

SIZE is the market value of equity defined as stock price at the end of the fiscal year multiplied by the number of shares (data#199*data#25).

BM is the book-to-market ratio (data#60/data#199*data#25).

ASSETS is the total assets of the firms (data#6).

TOTAL EQUITY is shareholders' equity (data#60).

ROA is net income deflated by total assets (data#18/data#6).

ACQ is an indicator variable equal to 1 if the firm made at least one acquisition in the year following the facility grant and zero otherwise. Information on this variable is obtained from the SDC database.

LEV is the leverage of the firm measured as total liabilities (data#181) divided by market value of equity.

GW is the total amount of goodwill on the balance sheet (data#204) as a percentage of total assets.

OTH_INTANG is the amount of intangibles other than goodwill (data#352), as a percentage of total assets.

LOSS is a dummy variable equal to 1 if net income for the year was less than or equal to zero, and zero otherwise.

RATING is a dummy variable equal to 1 if the firm's bond rating is investment grade or above and zero otherwise (data#280). The variable is only reported for 1,111 facilities of firms that have a valid rating (i.e. they have public rated debt).

MATURE is the log of the maturity of the loan in months.

SYNDICATE is the log of the number of lenders involved in the loan.
N is the number of observations.
SLACK is equal to the difference between the actual level of net worth (or tangible-net worth) in the fiscal year prior to the origination of the credit facility and the net worth (or tangible-net worth) threshold stated in the credit facility all divided by total assets. The data is available for 3,846 observations.
SLACK is* computed only for observations for which SLACK>0 (N=3,012)

Facility-specific data items are measured the year the facility is originated. Firm-specific data items are measured in the fiscal year prior to the origination of the facility and are obtained from Compustat. Facility-level data is taking from Dealscan between 1992 and 2003

Table 3

Correlations

N=4,096	***TNW***	***SIZE***	***BM***	***ROA***	***LEV***	***GW***	***OTH_INTANG***	***LOSS***	***RATING***	***MATURITY***	***SYNDICATE***
TNW		-0.06*	0.02	-0.06*	0.01	-0.27*	-0.08*	0.06*	-0.10*	-0.15*	-0.29*
SIZE	-0.21*		-0.01	0.03*	-0.00	-0.01	0.01	-0.03*	-0.28*	-0.05*	0.23*
BM	0.12*	-0.45*		-0.01	-0.04	0.00	-0.00	0.06*	-0.18*	-0.02	-0.02
ROA	-0.03*	0.26*	-0.34*		-0.01	0.01	-0.20*	-0.53*	0.20*	0.13*	0.12*
LEV	-0.04*	-0.16*	0.56*	-0.47*		0.01	-0.00	0.05*	-0.13*	-0.02	-0.02
GW	-0.22*	0.06*	-0.06*	0.03*	0.00		0.01	-0.03*	-0.08*	0.09*	0.15*
OTH_INTANG	-0.08*	0.12*	-0.01	-0.05*	0.05*	0.09*		0.05*	-0.00	-0.02	0.05*
LOSS	0.06*	-0.29*	0.17*	-0.68*	0.16*	-0.04*	0.03*		-0.18*	-0.13*	-0.20*
RATING	-0.10*	0.55*	-0.14*	0.20*	-0.21*	-0.04	-0.04	-0.18*		-0.26*	0.25*
MATURE	-0.18*	0.08*	-0.03*	0.10*	0.02	0.09*	-0.07*	-0.15*	-0.19*		0.21*
SYNDICATE	-0.29*	0.62*	-0.13*	0.09*	0.15*	0.15*	0.09*	-0.20*	0.29*	0.24*	

Pearson Correlations are displayed above the diagonal and Spearman correlations are displayed below the diagonal. * indicates significance at at least the 0.05 level. Variables are as defined in table 2.

Table 4

Frequencies of Net-Worth and Tangible-Net-Worth Covenants by Year

The table reports the frequencies of net-worth and tangible-net-worth covenants in our sample based on the year in which a debt contract was put into place.

		Net worth		Tangible net worth	
	Percent of sample	**N**	**Pct.**	**N**	**Pct.**
1992	0.2%	8	100.0%	0	0.0%
1993	0.2%	2	22.2%	7	77.8%
1994	0.9%	24	63.2%	14	36.8%
1995	6.0%	120	49.0%	125	51.0%
1996	13.8%	235	41.7%	329	58.3%
1997	13.5%	244	44.2%	308	55.8%
1998	13.9%	273	47.9%	297	52.1%
1999	12.3%	255	50.6%	249	49.4%
2000	11.5%	228	48.3%	244	51.7%
2001	10.2%	200	47.8%	218	52.2%
2002	11.1%	218	48.1%	235	51.9%
2003	6.4%	131	49.8%	132	50.2%

Table 5

Frequencies of Net-worth and Tangible-Net-Worth Covenants by Industry

The table reports the frequencies of net-worth and tangible-net-worth covenants in our sample based industry groups. The SIC codes of each group are also reported.

			Net worth		Tangible net worth	
Industry Group	**SIC codes included**	**% of sample**	**N**	**Pct.**	**N**	**Pct.**
Agriculture	0-999	0.3%	6	50.0%	6	50.0%
Mining & construction	1000-1299 1400-1999	3.8%	27	17.2%	130	82.8%
Food	2000-2111	3.1%	59	46.8%	67	53.2%
Textiles & printing/publishing	2200-2790	6.3%	149	58.2%	107	41.8%
Chemicals	2800-2824 2840-2899	2.3%	69	74.2%	24	25.8%
Pharmaceuticals	2830-2836	1.8%	26	36.1%	46	63.9%
Extractive	2900-2999 1300-1399	4.8%	50	25.3%	148	74.7%
Durable manufacturers	3000-3569 3580-3669	22.8%	430	46.1%	502	53.9%
Transportation	3680-3999	10.5%	135	31.3%	297	68.8%
Utilities	7370-7379 3570-3579 3670-3679	3.4%	75	54.0%	64	46.0%
Retail	4900-4999	1.3%	32	59.3%	22	40.7%
Services	5000-5999	13.1%	256	47.9%	279	52.1%
Computers	7000-7369 7380-9999	11.6%	308	64.6%	169	35.4%
Financial Services	6000-6999	15.0%	316	51.5%	297	48.5%

Table 6

Logistic Estimation of the Determinants of the Existence of a Tangible-Net-Worth Covenant

The table reports the results of four logistic models whose dependent variable is an indicator variable equal to one if a debt facility contains a minimum-tangible-net-worth requirement and equal to zero if the facility contains a minimum-net-worth requirement. The indicator variable is determined based on the classification appearing in the Dealscan database. Facility-level data is obtained from Dealscan between 1992 and 2003. The models also include industry controls, which are not reported in the tables. Industry descriptions are reported in table 5. Firm-clustered standard errors are reported (see Petersen, 2005). *, ** and *** indicate significance at the 10%, 5% and 1% level respectively.

Dependent Variable = *TNW*	**Model 1**		**Model 2**		**Model 3**		**Model 4**	
	Coeff.	Robust Std. Err	Coeff.	Robust Std. Err	Coeff.	Robust Std. Err	Coeff.	Robust Std. Err
INTERCEPT	1.832***	0.530	2.381**	0.586	2.277***	0.566	4.198***	0.691
GW	-6.624***	0.758	-6.501***	0.762	-6.550***	0.770	-6.565***	0.840
GW_ZERO	-0.302**	0.146	-0.364**	0.148	-0.343**	0.148	-0.332**	0.153
OTH_INTANG	-6.288***	1.627	-5.824***	1.563	-7.154***	1.729	-7.520***	1.877
RATING_EXIST	-0.209	0.174	0.008	0.175	-0.030	0.175	0.109	0.177
RATING	0.077	0.239	-0.068	0.247	-0.031	0.250	-0.230	0.245
ACQ	0.377*	0.224	0.441*	0.232	0.496**	0.239	0.572**	0.240
MATURE			-0.297***	0.070	-0.285***	0.070	-0.272***	0.073
SYNDICATE			-0.395***	0.065	-0.399***	0.065	-0.375***	0.068
POST					0.331**	0.135	0.513***	0.141
EBITDA_COV							-0.436***	0.160
NON_EBITDA_COV							-0.409	0.256
OTHER_COV							-0.396***	0.134
YIELD							-0.002**	0.001
LNSIZE	-0.200***	0.042	-0.054	0.047	-0.057	0.047	-0.126**	0.052
BM	0.223*	0.125	0.246**	0.123	0.229*	0.122	0.205*	0.118
LEV	-0.058*	0.033	-0.064**	0.033	-0.060*	0.032	-0.053*	0.031
ROA	-0.725	0.487	-0.822	0.511	-0.801	0.524	-0.747	0.516
LOSS	-0.185	0.172	-0.292*	0.175	-0.323*	0.177	-0.213	0.186
UNREALIZED_GAIN	1.225	5.894	0.508	5.814	0.407	5.747	0.318	5.252
14 industry controls based on 4-digit SIC codes	*included*		*included*		*Included*		*Included*	
N	*4,096*		*3,993*		*3,993*		3,661	
Pseudo-R-Squared	*13.7%*		*16.3%*		*16.4%*		18.0%	

Variable Definitions:

TNW is equal to 1 if the firm has a tangible-net-worth covenant and zero if the firm has a net-worth covenant.

GW is the total amount of goodwill on the balance sheet (data#204) as a percentage of total assets.

GW_ZERO is an indicator variable equal to 1 if goodwill is equal to 0. If goodwill does not equal to 0, then the variable equal 0.

OTH_INTANG is the amount of intangibles other than goodwill (data#352), as a percentage of total assets.

ACQ is the relative value of all acquisitions made in a firm's 2-digit SIC code group in the year prior to the debt contract. The relative value of acquisitions is computes as the value of all acquisitions divided by the total market capitalizations of all firms in that industry group.

RATING is a dummy variable equal to 1 if the firm's bond rating is investment grade or above and zero otherwise (data#280). We equate the indicator variable to 0 in cases where the debt rating variable is missing.

RATING_EXIST is an indicator variable equal to 1 if the debt rating (data#280) exist for that firms. The variable is equal to 0 if the debt rating is missing.

MATURE is the log of the maturity of the loan in months.

SYNDICATE is the log of the number of lenders involved in the loan.

POST is an indicator variable equal to 1 if the facility was originated in 2002 or after.

LNSIZE is the natural logarithm of market value of equity defined as stock price at the end of fiscal year multiplied by the number of shares (data#199*data#25).

BM is the book-to-market ratio (data#60/data#199*data#25).

LEV is the leverage of the firm measured as total liabilities (data#181) divided by total assets.

LOSS is a dummy variable equal to 1 if net income for the year was less than or equal to zero, and zero otherwise.

YIELD the cost of the loan measured as the mark-up over LIBOR.

UNREALIZED_GAIN is unrealized gains from marketable securities (data#238) divided by total assets.

N is the number of observations.

EBITDTA_COV is an indicator variable equal to 1 if a debt contract contain at least one of the covenants from the group of EBITDA covenants in the table below.

NON_EBITDA_COV is an indicator variable equal to 1 if a debt contract contain at least one of the covenants from the group of Non_EBITDA covenants in the table below.

OTHER_COV is an indicator variable equal to 1 if a debt contract contain at least one of the covenants from the group of "Other covenant" in the table below.

EBITDA Covenants	**Non_EBITDA covenants**	**Other covenants**
Fixed Charge Coverage	Current Ratio	Asset Sales Sweep
Debt Service Coverage	Quick Ratio	Debt Issue Sweep
Interest Coverage	Debt to tangible-net-worth	Equity Issue Sweep
Cash Interest Coverage	Leverage Ratio	Excess Cash Flow Sweep
Debt to Cash Flow	Debt to equity	Maximum Capital Expenditures
Senior Debt to Cash Flow	Dividend restrictions	
Minimum EBITDA		

Table 7

Two-stage Logistic Estimation of the Determinants of the Existence of a Tangible-Net-Worth Covenant

The table reports the results of a two-step Heckman selection procedure. In the first stage, we estimate the relation between an indicator variable that is equal to one if a minimum-worth requirement exists and a set of independent variables chosen to explain cross-sectional variation in use of minimum-net-worth requirements. The second stage's dependent variable is the one used in models 1-4 in Table 6. Firm-clustered standard errors are reported. *, ** and *** indicate significance at the 10%, 5% and 1% level respectively. Facility-level data is obtained from Dealscan between 1992 and 2003.

Model 5 1st stage of a Heckman Selection model				**Model 5 2nd stage of a Heckman Selection model**		
Dependent Variable = Net Worth				**Dependent Variable = Tangible Net Worth**		
	Coeff.	Robust Std. Err			Coeff.	Robust Std. Err
INTERCEPT	0.118	0.227		**INTERCEPT**	1.101	1.111
GW	0.119	0.097		***GW***	-1.054***	0.178
LNSIZE	-0.143***	0.016		***GW_ZERO***	-0.047	0.034
BM	0.042**	0.018		***OTH_INTANG***	-1.211***	0.085
LEV	-0.058***	0.012		***RATING_EXIST***	0.019	0.019
ROA	0.191	0.133		***RATING***	-0.012	0.064
LOSS	-0.069	0.053		***ACQ***	0.079	0.107
UNREALIZED_GAIN	1.359	1.257		***MATURE***	-0.062***	0.014
VOLATLITY	0.027	0.138		***SYNDICATE***	-0.092***	0.022
PPE	-0.007	0.043		***POST***	0.057***	0.018
INT_COVERAGE	0.002	0.006		***LNSIZE***	-0.029	0.101
				BM	0.028	0.048
				LEV	-0.012	0.049
				ROA	-0.094	0.171
				LOSS	-0.050	0.056
				UNREALIZED_GAIN	0.366	1.213
				Inverse Mills Ratio	0.118	1.030
14 industry controls based on 4-digit SIC codes	*included*				*included*	
N	*14,148*				*3,993*	
Pseudo-R-Squared	*6.7%*				*16.5%*	

Variable Definitions:

TNW is equal to 1 if the firm has a tangible-net-worth covenant and zero if the firm has a net-worth covenant.

GW is the total amount of goodwill on the balance sheet (data#204) as a percentage of total assets.

GW_ZERO is an indicator variable equal to 1 if goodwill is equal to 0. If goodwill does not equal to 0, then the variable equal 0.

OTH_INTANG is the amount of intangibles other than goodwill (data#352), as a percentage of total assets.

ACQ is the relative value of all acquisitions made in a firm's 2-digit SIC code group in the year prior to the debt contract. The relative value of acquisitions is computed as the value of all acquisitions divided by the total market capitalizations of all firms in that industry group.

RATING is a dummy variable equal to 1 if the firm's bond rating is investment grade or above and zero otherwise (data#280). We equate the indicator variable to 0 in cases where the debt rating variable is missing.

RATING_EXIST is an indicator variable equal to 1 if the debt rating (data#280) exist for that firms. The variable is equal to 0 if the debt rating is missing.

MATURE is the log of the maturity of the loan in months.

SYNDICATE is the log of the number of lenders involved in the loan.

POST is an indicator variable equal to 1 if the facility was originated in 2002 or after.

LNSIZE is the natural logarithm of market value of equity defined as stock price at the end of fiscal year multiplied by the number of shares (data#199*data#25).

BM is the book-to-market ratio (data#60/data#199*data#25).

LEV is the leverage of the firm measured as total liabilities (data#181) divided by total assets.

LOSS is a dummy variable equal to 1 if net income for the year was less than or equal to zero, and zero otherwise.

UNREALIZED_GAIN is unrealized gains from marketable securities (data#238) divided by total assets.

VOLATILITY is the annual stock return volatility calculated based on daily returns in the year prior to the debt contract.

PPE is Property, Plant and Equipment (data#8) deflated by total assets.

INT_COVERAGE is the interest coverage ratio defined as interest Expense (data#15) divided by Income before Interest, Taxes and Depreciation and Amortization.

N is the number of observations.

Table 8

Logistic Estimation of the Determinants of the Existence a Tangible-Net Worth Covenant (Robustness tests)

The table reports the results of logistic models whose dependent variable is an indicator variable equal to one if a debt facility contains a minimum-tangible-net-worth requirement and equal to zero if the facility contains a minimum-net-worth requirement. The indicator variable is determined based on the classification appearing in the Dealscan database. The first model is the base model that is reported in Table 6. The second model reported in the table is estimated using an alternative sample that is collected using a keyword search of 10K on Lexis which identified contracts that contained net-worth and tangible-net-worth in the years 1998-2002. The third model is similar to model 3 in Table 6 and is estimated using one random observation for every firm in the sample. Its standard errors, therefore, are not clustered controlling for firm-effects. The models also include industry controls, which are not reported in the tables. Firm-clustered standard errors are reported for the first and second model. *, ** and *** indicate significance at the 10%, 5% and 1% level respectively. Facility-level data is obtained from Dealscan between 1992 and 2003.

Dependent Variable = *TNW*	**Model 1 Deal Scan Sample**		**Model 1 Alternate Sample**		**Model 3 Random Observations**	
	Coeff.	Robust Std. Err	Coeff.	Robust Std. Err	Coeff.	Std. Err
INTERCEPT	1.832***	0.230	2.379	1.635	2.109***	0.776
GW	-6.624***	0.758	-5.283***	1.147	-5.937***	0.850
GW_ZERO	-0.302**	0.146	-0.390**	0.212	-0.285*	0.159
OTH_INTANG	-6.288***	1.627	0.542	2.204	-5.920***	2.363
RATING_EXIST	-0.209	0.174	-0.812***	0.252	0.071	0.189
RATING	0.077	0.239	0.608*	0.362	-0.133	0.250
ACQ	0.377*	0.224	0.211	0.333	0.561**	0.240
MATURE					-0.496***	0.093
SYNDICATE					-0.509***	0.077
POST					0.164	0.167
LNSIZE	-0.200***	0.042	-0.195***	0.049	-0.003	0.049
BM	0.223*	0.125	0.051	0.036	0.171	0.106
LEV	-0.058*	0.033	-0.025	0.017	-0.044	0.028
ROA	-0.725	0.487	-0.471	0.393	-0.888*	0.529
LOSS	-0.185	0.172	0.006	0.207	-0.423**	0.185
UNREALIZED_GAIN	1.225	5.894	-1.455	3.096	-4.626	4.467
14 industry controls based on 4-digit SIC codes	*included*		*included*		*included*	
N	*4,096*		*863*		*1,511*	
Pseudo-R-Squared	*13.7%*		*13.2%*		*17.0%*	

Table 9
Regression Estimates of the Variables Associated with Covenant Slack

The table reports the results from estimation of regression models whose dependent variable is either (i) *SLACK*, which is equal to the difference between the actual level of net worth (or tangible-net worth) in the fiscal year prior to the origination of the credit facility and the net worth (or tangible-net worth) threshold stated in the credit facility all divided by total assets or (ii) Log(*SLACK_RATIO*) which is equal to the natural logarithm of the actual level of net worth (or tangible-net worth) in the fiscal year prior to the origination of the credit facility *divided by* the net-worth (or tangible-net-worth) threshold stated in the credit facility all divided by total assets. Facility-level data is obtained from Dealscan between 1992 to 2003. Actual net worth is defined to be consistent with the net-worth benchmark in the covenant. The models are estimated for all facilities for which *SLACK* is positive. The models include industry controls, which are not reported in the tables. Firm-clustered standard errors are reported. *, ** and *** indicate significance at the 10%, 5% and 1% level respectively.

	Model 1		**Model 2**	
Dependent variable =	***SLACK***		***Log(SLACK_RATIO)***	
	Coefficient	Robust Std. Errors	Coefficient	Robust Std. Errors
INTERCEPT	0.174**	0.788	0.545	0.459
TNW	-0.027	0.025	-0.100	0.174
GW	-0.025	0.032	-0.276	0.186
GWZERO	0.031***	0.008	0.049	0.052
OTH_INTANG	-0.010	0.085	-0.689**	0.270
RATING_EXIST	-0.042***	0.008	-0.004	0.064
RATING	0.033***	0.011	0.222**	0.089
ACQ	0.007	0.009	-0.133*	0.079
POST	0.022**	0.011	0.004	0.067
MATURE	-0.024	0.019	-0.144	0.112
SYNDICATE	-0.026	0.016	-0.030	0.112
LNSIZE	0.012***	0.003	0.045***	0.012
BM	0.035***	0.007	-0.029	0.040
LEV	-0.009***	0.002	0.007	0.010
ROA	-0.062	0.041	-0.231	0.189
LOSS	0.008	0.011	0.071	0.055
UNREALIZED_GAIN	0.068	0.189	-0.171	0.759
14 industry controls based on 4-digit SIC codes	*Included*		*Included*	
N	*2,973*		*2,961*	
Adjusted-R-Squared	11.6%		4.2%	

Variable Definitions:

SLACK is equal to the difference between the actual level of net worth (or tangible-net worth) in the fiscal year prior to the origination of the credit facility and the net worth (or tangible-net worth) threshold stated in the credit facility all divided by total assets.

SLACK_RATIO is the ratio of the actual level of net worth (or tangible-net worth) in the fiscal year prior to the origination of the credit facility divided by the net worth (or tangible-net worth) threshold stated in the credit facility.

TNW is equal to the proportion of facilities taken by firms in the same industry-group as the examined firm (excluding the examined firm) that included a tangible-net-worth covenant during the same year as the examined facility.

GW is the total amount of goodwill on the balance sheet (data#204) as a percentage of total assets.

GW_ZERO is an indicator variable equal to 1 if goodwill is equal to 0. If goodwill does not equal to 0, then the variable equal 0.

OTH_INTANG is the amount of intangibles other than goodwill (data#352), as a percentage of total assets.

ACQ is the relative value of all acquisitions made in a firm's 2-digit SIC code group in the year prior to the debt contract. The relative value of acquisitions is computed as the value of all acquisitions divided by the total market capitalizations of all firms in that industry group.

RATING is a dummy variable equal to 1 if the firm's bond rating is investment grade or above and zero otherwise (data#280). We equate the indicator variable to 0 in cases where the debt rating variable is missing.

RATING_EXIST is an indicator variable equal to 1 if the debt rating (data#280) exist for that firms. The variable is equal to 0 if the debt rating is missing.

MATURE is the average log of the maturity of loans in months taken by firms in the same industry-group as the examined firm (excluding the examined firm) during the same year as the examined facility.

S*YNDICATE* is the average log of the number of lenders involved in loans taken by firms in the same industry-group as the examined firm (excluding the examined firm) during the same year as the examined facility.

POST is an indicator variable equal to 1 if the facility was originated in 2002 or after.

LNSIZE is the natural logarithm of market value of equity defined as stock price at the end of fiscal year multiplied by the number of shares (data#199*data#25).

BM is the book-to-market ratio (data#60/data#199*data#25).

LEV is the leverage of the firm measured as total liabilities (data#181) divided by total assets.

LOSS is a dummy variable equal to 1 if net income for the year was less than or equal to zero, and zero otherwise.

UNREALIZED_GAIN is unrealized gains from marketable securities (data#238) divided by total assets.

N is the number of observations.