



Accounting standards and debt covenants: Has the “balance sheet approach” led to a decline in the use of balance sheet covenants? ☆

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ABSTRACT

Recent years have seen a sharp decline in the use of balance sheet-based covenants in private debt contracts. I hypothesize that changes in accounting standards can explain part of this decline. Standard setting has shifted towards a “balance sheet approach”, which I predict has made the balance sheet less useful for contracting. I measure the effect of the balance sheet approach on specific borrowers using a volatility ratio. I find that borrowers with greater volatility ratios are less likely to have balance sheet-based covenants. This evidence is consistent with reductions in the contracting usefulness of the balance sheet being associated with reductions in balance sheet covenants.

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1. Introduction

Recent years have seen striking changes in covenant inclusion in debt contracts. In 1996, financial covenants measured with balance sheet variables—including Leverage, Net Worth, and Current Ratio—were included in more than 80% of private debt contracts.¹ In the intervening years, their use declined sharply, to only 32% of deals by 2007. The same trend is not apparent for other types of financial covenants. For example, covenants measured with income statement ratios—such as Interest Coverage, Fixed Charge Coverage, and Debt-to-Earnings—have been included in between 74% and 82% of deals over the same period, displaying no declining trend in use (see Fig. 1).

This trend in covenant use has been accompanied by a change in the direction of accounting standard setting. Based in large part on the FASB’s Conceptual Framework, the objective of standard setting has shifted from the determination of net income (the income statement approach) to the valuation of assets and liabilities (the balance sheet approach). As described in Dichev (2008), the conceptual focus on the balance sheet has been accompanied by a variety of new accounting standards, including changes in accounting for goodwill and asset securitization as well as expanded recognition rules for hedge accounting. There has also been broader adoption of fair value accounting, in which many financial assets and liabilities are recognized on the balance sheet at market price rather than historical cost. Recent

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¹ I define financial covenants as provisions in the debt contract requiring the borrower to maintain a threshold level of an accounting-based measure.

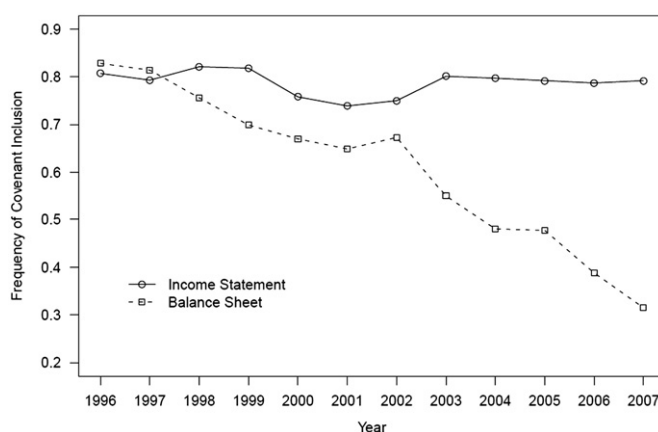


Fig. 1. Financial covenant inclusion by year, 1996–2007. Income statement covenants include interest coverage, fixed charge coverage, and debt-to-earnings. Balance sheet covenants include leverage, net worth, and current ratio.

accounting standards have further solidified the balance sheet approach, and suggest the trend towards fair value accounting is likely gaining momentum.²

I hypothesize that this shift in standard setting has potentially compromised the value of the balance sheet for debt contracting. As discussed in *Holthausen and Watts (2001)*, *Watts (2003)*, and *Kothari et al. (2010)*, debt contracting parties rely on a conservative balance sheet, with high thresholds of verifiability, to reflect the lower bound of the liquidation value of net assets. Accounting under the balance sheet approach, however, often features estimates of asset and liability values, as well as discretion in the timing of recognition of value changes. These value estimates—which I term “balance sheet adjustments”—have the potential to limit the contracting usefulness of the balance sheet by introducing error and bias into reported asset and liability values. Because balance sheet adjustments provide unreliable signals of the borrower’s liquidation value, lenders will, in turn, use balance sheet-based financial covenants less frequently. I therefore hypothesize that this trend in standard setting has contributed to the change in covenant use, and that the magnitude of balance sheet adjustments is negatively associated with the likelihood of a borrower having a balance sheet covenant.

Using a sample of 8,527 private debt agreements issued between 1996 and 2007, I document the decline in balance sheet covenant use. I measure the borrower-specific exposure to balance sheet-based accounting rules using the Volatility Ratio (VR), the ratio of the volatility of changes in book value over the volatility of adjusted net income, which excludes several transient components.³ VR captures the magnitude of balance sheet adjustments such as marking investments to market and recognizing impairment write-offs. Consistent with my prediction, I find a significant negative relation between VR and inclusion of balance sheet covenants. I do not, however, find a significant relation between VR and inclusion of income statement covenants. The empirical results are robust to a variety of alternative specifications, including use of different measures of balance sheet focus.

Although the subject of this study is accounting standards and how they influence the contracting usefulness of balance sheet information, there are other plausible explanations for the pattern of declining balance sheet covenant use. I find that the asset bases of borrowers are associated with covenant use, as borrowers with more assets in place and fewer operating leases are more likely to have balance sheet covenants. I also find that deals with an “institutional tranche” (i.e. a Term Loan Tranche B or higher), which are more likely to be sold or securitized (*Wittenberg-Moerman, 2008*), are less likely to have balance sheet covenants. I interpret this as evidence that changes in the syndicated loan market have also affected covenant use. I also examine the association between increased competition in lending and covenant use. Although I find some evidence of covenant loosening by lenders who most aggressively expanded market share over the sample period, the results suggest that competition has not contributed to the change in use of balance sheet covenants. Finally, the association between VR and balance sheet covenant use is robust to these alternative explanations, consistent with the view that changes in accounting standards have contributed to the change in covenant inclusion.

Although there is a strong association between VR and balance sheet covenant inclusion, there is no relation between the ratio and income statement covenant use. I expect that there are two reasons for this. First, “dirty surplus” in US GAAP allows many balance sheet adjustments to temporarily avoid recognition on the income statement; for example, a valuation adjustment on an available-for-sale security is classified as other comprehensive income until the security is sold.⁴ Second, when adjustments do articulate through the income statement, earnings in debt covenants is generally

² SFAS No. 159 expands the reach of fair value accounting to a broad range of financial assets and liabilities.

³ I define Adjusted Net Income as net income less special items and non-operating income and expense. The ratio is designed to exclude transient items in the denominator, thus isolating non-contracting useful items in the numerator. This measure is discussed in *Section 3.2*.

⁴ Dirty surplus refers to the articulation of changes in consecutive balance sheets through the income statement. Under “clean surplus” accounting, all changes in balance sheet values appear on the income statement; with a dirty surplus relation, some changes in balance sheet accounts are reported directly in shareholders’ equity (as Other Comprehensive Income) and so do not affect the income statement.

modified from its GAAP definition to exclude these adjustments (for example, earnings in debt covenants are often modified to exclude “non-cash” items and write-ups and write-downs of asset values). In contrast, balance sheet measures such as net worth are seldom modified from their GAAP definition in debt covenants.⁵

Despite the debate on the merits of the balance sheet versus income statement approaches to standard setting (Barth, 2006; Benston et al., 2007; Dichev, 2008), there is little evidence examining what impact the ongoing shift to the balance sheet approach has had on the qualities of accounting information. The results of this study suggest that balance sheet information has become less useful for an important group of users of financial statement data: debt contracting parties. Although this study does not directly examine the consequences of this change, the evidence is consistent with a lower supply of debt contracting provisions. To the extent that this reduction in supply is costly, it is important to understand both its consequences and its causes.

In Section 2, I present the hypothesis development. In Section 3, I describe the sample and develop the Volatility Ratio, the empirical measure of balance sheet focus. In Section 4, I present empirical tests and results. I conclude in Section 5.

2. Hypothesis development

2.1. Accounting information in debt contracts

Debt contracts, and particularly private debt contracts, use financial statement data (Smith and Warner, 1979; Leftwich, 1983), where both the income statement and balance sheet provide useful information. The income statement provides information about the current operating performance of the firm, and indicates whether the borrower will produce sufficient cash flows to service the debt (Kothari et al., 2010). The balance sheet, on the other hand, provides a lower bound of the value of separable assets and liabilities; as noted in Watts (2003), this “verifiable lower bound” of firm value approximates the minimum value the lender might recoup in the event of an orderly liquidation.

There are two possible roles for accounting data in debt contracting. First, it can serve an “information” role by helping the lender determine the likelihood and potential cost of default (Amiram, 2010) so the lender can factor this into the initial design and subsequent renegotiation of the loan. Second, as studied in this paper, accounting can be used in a “direct contracting” role, with provisions such as financial covenants or performance pricing being written directly on accounting variables. In the direct contracting role, if the contracting usefulness of a piece of information is sufficiently reduced, I expect it will no longer be used in debt contracts.

2.2. Balance sheet and income statement approaches

Dichev (2008) describes two alternative and competing approaches to financial reporting. The “balance sheet approach” views the valuation of assets and liabilities as the principal focus of financial reporting. Under the balance sheet approach, income statement accounts are a function of changes in related balance sheet accounts and thus determined on a secondary basis. In contrast, the “income statement approach” views the determination of revenues, expenses, and, most importantly, earnings as the primary goal of financial reporting. Under the income statement approach, the balance sheet accounts are the residual of the determination of the income statement accounts, and essentially collect the cumulative effects of periodic accruals.

Under clean surplus accounting—where all changes in balance sheet accounts articulate through the income statement—the balance sheet and income statement approaches are mutually exclusive. That is, once one approach is adopted, by preparing one statement the other follows mechanically. In practice, however, accounting does not generally follow the clean surplus relation. Over time, “dirty surplus” has evolved in GAAP, in which some changes in balance sheet accounts do not immediately articulate through the income statement. Holthausen and Watts (2001) describe how users’ differing information demands have resulted in the need for dirty surplus. While the income statement provides information about current period performance and is useful for evaluating and compensating management, dirty surplus excludes items from the income statement that do not provide information about current performance, such as certain adjustments to marketable securities, derivatives, foreign currency, and pension accruals.⁶ In contrast, the balance sheet provides information about the value of separable assets and liabilities, which is useful for assessing management’s stewardship of firm assets and for measuring the lower bound of the liquidation value of the firm. Non-articulating (i.e. dirty surplus) items are potentially informative of the net asset value of the firm, so they are reported on the balance sheet. Allowing for dirty surplus essentially blends the two approaches to financial reporting, providing a single set of general purpose financial statements to serve the information needs of different users.

Historically, each approach to standard setting has enjoyed periods of relative prominence. Financial statements in the early industrial era were used almost exclusively by banks making credit decisions (Chatfield, 1977), so the balance sheet approach helped bankers to more accurately value borrowers’ collateral. As equity ownership broadened to less

⁵ A notable exception is goodwill, which is sometimes excluded from the calculation of net worth (Frankel et al., 2008).

⁶ Kothari et al. (2010), drawing on Holthausen and Watts (2001), note that dirty surplus items are unlikely to be useful for measuring managerial performance.

sophisticated investors, and users demanded a summary measure of periodic firm performance, accounting moved toward the income statement approach.⁷ The income statement approach, famously summarized in Paton and Littleton (1940), dominated early formal standard setting following the Securities Acts. Conceptual primacy again shifted starting in 1973 with the commencement of the FASB's Conceptual Framework Project. The Conceptual Framework places greater emphasis on balance sheet elements, specifically defining assets and liabilities as the primitive constructs in financial reports, with net income and its components being derivative.⁸

Many accounting standards—including most that deviate from historical cost valuation—fall under the rubric of the balance sheet approach. Some pre-date the FASB; for example, under ARB No. 43 (issued in 1953) inventory is recognized at the lower of cost or market. Similarly, asset impairment rules have been pervasive since the early FASB standards.⁹ The general trend over time has been expansion of the balance sheet approach. Examples include changes in accounting for income taxes (from APB No. 11 in 1967 to SFAS No. 109 in 1992) and accounting for marketable securities (from SFAS No. 12 in 1975 to SFAS No. 115 in 1993).

A major standard-setting initiative related to the balance sheet approach is the use of fair value accounting. Under fair value, assets and liabilities are recognized at market, or exit, values. Fair value is commonly used for financial assets and liabilities, including marketable securities (SFAS No. 115), mortgage servicing rights (SFAS No. 122), hedging transactions (SFAS No. 133), and securitization (SFAS No. 156). SFAS Nos. 157 and 159 present guidance for the consistent application of fair value across a broad range of financial assets and liabilities.

I term adjustments to asset and liability carrying values under the balance sheet approach as “balance sheet adjustments” (or simply “adjustments”). I divide adjustments into two categories. Fair Value Adjustments are upward and downward revaluations to financial assets and liabilities. These adjustments are based on actual market prices (Level I), price estimates based on observable market inputs (Level II), or price estimates based on unobservable market inputs (Level III). The presumption in using fair value is that the amount reported on the balance sheet reflects the market expectations of the value of the asset or liability. The second category, Other Balance Sheet Adjustments, includes adjustments to fixed or intangible assets, commonly as impairment write-offs or restructuring charges. Fair value adjustments and other balance sheet adjustments differ in two key ways. First, fair value adjustments include both gains and losses, while other balance sheet adjustments generally include only losses. Second, while impairment and restructuring charges are ideally based on market prices (i.e. fair values), there are rarely liquid markets for fixed assets and other long-term assets subject to impairment (Riedl, 2004). As a result, the owner of a to-be-impaired asset estimates a value using “the best information available in the circumstances” (SFAS No. 121, para. 7), often the discounted value of expected future cash flows. In the terminology of Barth (2006), impairments and restructuring charges result in an “entity-specific value”—reflecting the value-in-use of the asset based on the expectations of the manager—rather than a “fair value” reflecting market expectations. While these two types of adjustments are distinct, each represents a deviation from historical cost accounting. Therefore, I consider both as measurable manifestations of the balance sheet approach to accounting.

2.3. Hypothesis development

In this section, I develop my hypothesis that balance sheet adjustments have contributed to the decline in use of balance sheet covenants. As a framework for assessing the impact of adjustments, consider a firm with debt and the choice to have an income statement and/or balance sheet covenant.¹⁰ If there are no capital transactions (i.e. dividends, stock issuances/repurchases) and clean surplus accounting holds, the income statement and balance sheet are linked by the following identity:

$$\Delta BV = \text{net income} \quad (1)$$

That is, all changes in book value articulate through the income statement as part of net income. In this setting, contracting parties are indifferent between income statement and balance sheet covenants, as they provide essentially the same information. In practice the clean surplus relation does not hold, and some changes in book value are recognized directly in shareholders' equity (delaying recognition on the income statement). This leads to “dirty surplus” accounting:

$$\Delta BV = \text{net income} + \text{dirty surplus} \quad (2)$$

As described in Holthausen and Watts (2001), dirty surplus items include changes in book value that are not useful for evaluating and compensating management. However, these changes are useful for measuring overall firm value, so they are reflected on the balance sheet.

⁷ Even prior to regulated reporting, firms were shifting voluntary reporting practices to better inform equity investors (Shivakumar and Waymire, 1993; Barton and Waymire, 2004).

⁸ The FASB defines net income as changes in the value of assets and liabilities (Concepts Statement No. 6: “Elements of Financial Statements”). Dichev (2008) argues that assets and liabilities cannot be defined in the absence of revenues and expenses.

⁹ SFAS No. 121, “Accounting for the Impairment of Long-Lived Assets and for Long-Lived Assets to be Disposed Of” (issued in 1995) standardized the rules for recognizing impairments; the issuance of this standard was intended, at least in part, to address the increasing frequency and magnitude of asset write-offs (Francis et al., 1996).

¹⁰ I define income statement and balance sheet covenants based on the source of the financial measure. Formal definitions are provided in Section 3.1.

It is important to note that not all information in either statement is useful for debt contracting. While dirty surplus accounting results in an income statement that broadly captures current period firm performance, debt contracting requires a more focused number; specifically, lenders want to assess the borrower's ability to make future cash payments. Hence, debt contracting parties focus on the relatively persistent continuing operations of the firm, and place less weight on more transient items, such as non-operating gains and losses. On this basis, I break net income into two components:

$$\Delta BV = \text{adjusted net income} + \text{other income} + \text{dirty surplus} \quad (3)$$

Adjusted Net Income is the more persistent portion of net income, while Other Income includes the more transient items that are excluded from the adjusted measure. I anticipate debt contract provisions written on income statement values will feature net income modified from its GAAP definition to include only the persistent portions, i.e. earnings-based covenants will be written on adjusted net income. From the balance sheet, debt contracting parties want information on the lower bound of liquidation value of separable assets and liabilities (Kothari et al., 2010). Assuming no intangibles in assets, covenants written on balance sheet variables will use the firm's entire book value.¹¹

In this framework, assume the firm purchases an asset that is later revalued based on managerial estimates. Adjustments are classified either as other income (if they articulate through the income statement) or dirty surplus, but not as adjusted net income. Since earnings-based covenants are written to include only adjusted net income, adjustments should not affect the usefulness of the income statement in debt contracting.¹²

In contrast, adjustments should affect the contracting usefulness of the balance sheet. Following Watts (2003) and Kothari et al. (2010), I assume the contracting objective of the balance sheet is to measure the lower bound of the liquidation value of firm net assets. If including adjustments leads to a more faithful representation of asset and liability value—that is, a value free from bias and error, “complete” in its depiction of the asset or liability, and from a verifiable source—then the inclusion of adjustments should result in a superior measure of liquidation value from the balance sheet.¹³ This suggests that adjustments should make balance sheet information more useful for debt contracting, and lead to increased use of balance sheet covenants, holding other things equal.

However, adjustments must be verifiably measured to be useful for contracting (Watts, 2003). While some balance sheet adjustments are sufficiently verifiable to be used in contracts (e.g. exchange-traded marketable securities), many are not. For example, Type III valuation under fair value accounting allows for unobservable inputs to valuation, and other balance sheet adjustments such as impairment charges require the manager to estimate the timing and amounts of future cash flows. The uncertainty inherent in such estimates can result in unintentional errors. Additionally, there is evidence that managers use discretion opportunistically in fixed asset impairments (Francis et al., 1996; Riedl, 2004), goodwill impairments (Beatty and Weber, 2006; Ramanna and Watts, 2011), and in fair value estimates such as securitizations (Dechow et al., 2010). So, even as balance sheet adjustments may provide information about the liquidation value of the borrower, if the estimates lack verifiability, they will not be useful for contracting. Furthermore, if the quality of balance sheet adjustment estimates cannot be credibly signaled (i.e. the estimates are not verifiable, so the extent of bias or error cannot be measured), it is difficult for contracting parties to know which adjustments to include or exclude in writing covenants, making modification of balance sheet values relatively difficult.

I hypothesize that increases in unverifiable balance sheet adjustments and the difficulty of modifying balance sheet covenants have made the balance sheet less useful for debt contracting, and have contributed to the decline in the use of balance-sheet based covenants. This explanation is consistent with the timing of the sharp decline in balance sheet covenant usage documented in Fig. 1. Because adjustments are ostensibly used to make the balance sheet more informative to financial statement users, it is of particular interest to understand whether balance sheet adjustments have had the unintended consequence of reducing the usefulness of the balance sheet for some users. It is important to note, however, that balance sheet adjustments are not the only implication of current accounting rules. For example, operating leases allow firms to use assets without recognizing them on the balance sheet, and many intangible assets (i.e. growth opportunities, R&D investments) are not recognized on the balance sheet. I also, therefore, investigate whether borrowers with more assets in place and fewer operating leases are more likely to have balance sheet covenants.

To summarize, balance sheet adjustments are a manifestation of the balance sheet approach to financial reporting, with adjustments being made to reflect proper values on the balance sheet. I expect that balance sheet adjustments have not affected the contracting usefulness of the income statement, as the adjustments are either written out of the earnings measure used in the contract, or temporarily avoid income statement recognition due to dirty surplus accounting. In contrast, adjustments potentially enhance the information in balance sheet values pertaining to the liquidation value of the firm. However, when balance sheet adjustments are unverifiable, there is risk that errors in estimation or bias will limit

¹¹ Kothari et al. (2010) discuss how goodwill and many other intangibles (e.g. research and development assets) only have value when the firm is a going concern, and hence are not useful in contracting. Since I expect that intangibles will be written out of balance sheet covenants, this illustration includes only tangible assets. Frankel et al. (2008) show that goodwill and other intangibles are often written out of net worth debt covenants.

¹² Empirically, earnings-based debt covenants are written to exclude a variety of items, including write-ups and write-downs of asset values, non-recurring items, and non-cash items; this is consistent with balance sheet adjustments not being useful when contracting on income statement variables. In contrast, balance sheet values are less frequently modified. Data on the modification of accounting measures in debt covenants is shown in Appendix A.

¹³ Statement of Financial Accounting Concepts No. 8 defines “faithful representation” as information that is “complete, neutral, and free of error” (QC 12). Faithful representation replaces reliability as a qualitative characteristic of accounting information.

the information provided by the measure. I expect the seriousness of this problem to increase with the borrower's exposure to balance sheet adjustments, leading to the hypothesis:

Hypothesis. Borrowers subject to more and larger balance sheet adjustments have fewer balance sheet-based debt covenants.

3. Data and sample

3.1. Financial covenants and loan data

The sample consists of 8,527 private debt agreements to publicly traded, non-financial borrowers drawn from the LPC/Dealscan database.^{14,15} The sample covers the period 1996 through 2007.¹⁶ Accounting data is collected from Compustat using quarterly Xpressfeed. Loan data are matched with the "Deal Active Date" from Dealscan to the most closely preceding quarter from Compustat. Because Dealscan lacks conventional firm descriptors (e.g. cusip, gvkey, permno), I match the deals by name and hand-check to verify that each match is correct.

Dealscan provides data on financial covenants, which are provisions of the debt contract where the borrower must maintain a threshold level of an accounting-based financial measure. If the borrower fails to maintain the threshold, the loan enters technical default and the lender has the option to take action. Possible actions include renegotiation and termination of the loan. I examine six categories of financial covenants, two of which are income statement-based:

- *Interest Coverage* is the ratio of earnings to interest expense.
- *Fixed Charge Coverage* is the ratio of earnings to various charges, including interest expense, principal payments, capital expenditures, taxes, dividends, and others.

Three categories are balance sheet-based:

- *Leverage* is the ratio of total debt to total assets or total net assets.
- *Net Worth* is assets minus liabilities, and can include all assets or only tangible assets.
- *Current Ratio* is the ratio of short-term assets to short-term liabilities.

A sixth covenant category, *Debt-to-Earnings*, is defined as total debt to earnings. Since debt itself is not subject to fair value rules during the sample period, only earnings are potentially affected by balance sheet adjustments. Hence, I classify debt-to-earnings covenants as income statement-based (in contrast to leverage, which is measured entirely with balance sheet variables).

Table 1, Panel A shows the frequency of use for each type of covenant by year. Use of Interest Coverage is stable over time, while use of Fixed Charge Coverage declines over the sample period. Use of Debt-to-Earnings grows over the sample period, rising from 0.384 in 1996 to 0.651 in 2007. In contrast, use of each of the balance sheet covenants declines over the sample period. Leverage use falls by more than half, from 0.517 to 0.164, while Net Worth (0.626 to 0.131) and Current Ratio (0.302 to 0.046) decline even more sharply. This data illustrates the decline in the inclusion of balance sheet-based covenants.

I do not make predictions on the inclusion of specific covenant types; for example, I do not anticipate that changes in accounting standards should affect interest coverage covenants more or less than fixed charge covenants. Rather, I base the predictions on which financial statement the data from the covenant is measured. I aggregate the six covenant types into two classes: I code a deal as having an income statement covenant if it has at least one of interest coverage, fixed charge coverage, or debt-to-earnings; balance sheet covenant deals are those that include one or more of leverage, net worth, or current ratio.

Yearly summary data is presented in Table 1, Panel B. This table illustrates the relative changes in income statement versus balance sheet covenant use. In 1996, each type of covenant is included in about 80% of deals. This shows that (a) use of both classes of covenants was pervasive, and (b) deals frequently included both classes concurrently. Over time, the use of income statement covenants varies mildly: the frequency ranges from a high of 0.821 in 1998 to a low of 0.739 in 2001, with an average 0.788 across the entire sample period. In contrast, balance sheet covenant use declined sharply over the sample period, from a high of 0.828 in 1996 to a low of 0.315 in 2007 (see Fig. 1).

¹⁴ I exclude a total of 473 deals with no covenants (either financial or non-financial) reported on Dealscan. Drucker and Puri (2009) document that Dealscan sometimes underreports the amount of covenants in deals, and that deals with no covenants reported are potentially data errors. Empirical results are similar when these deals are included.

¹⁵ I focus on non-financial firms as the affect of changing standards (and particularly fair value) on financial firms has received considerable attention in the literature (Nissim and Penman, 2008; Laux and Leuz, 2009; Khan, 2009; Goh et al., 2009; Dechow et al., 2010).

¹⁶ Dealscan covers most private loan agreements starting in 1996. I exclude years after 2007 due to the financial crisis and the impact this had on debt contracting, particularly the supply of loans. I discuss loan contracting in the crisis period in Section 4.5.

Table 1
Covenant types and classes.

<i>Panel A: Covenant types</i>							
Year	Obs.	Interest coverage	Fixed charge coverage	Debt-to-earnings	Leverage	Net worth	Current ratio
1996	755	0.409	0.489	0.384	0.517	0.626	0.302
1997	794	0.368	0.495	0.452	0.491	0.615	0.241
1998	620	0.408	0.515	0.550	0.379	0.553	0.221
1999	565	0.414	0.487	0.563	0.317	0.519	0.147
2000	603	0.371	0.431	0.516	0.317	0.476	0.129
2001	712	0.338	0.402	0.501	0.294	0.428	0.107
2002	765	0.359	0.395	0.482	0.305	0.469	0.103
2003	811	0.397	0.437	0.559	0.233	0.366	0.089
2004	896	0.413	0.381	0.575	0.254	0.263	0.061
2005	807	0.405	0.352	0.585	0.261	0.243	0.052
2006	694	0.383	0.333	0.614	0.210	0.183	0.072
2007	505	0.378	0.295	0.651	0.164	0.131	0.046
Total	8,527	0.387	0.418	0.532	0.315	0.407	0.131

<i>Panel B: Covenant classes</i>			
Year	Observations	Covenant class	
		Income statement	Balance sheet
1996	755	0.807	0.828
1997	794	0.793	0.814
1998	620	0.821	0.756
1999	565	0.818	0.699
2000	603	0.758	0.670
2001	712	0.739	0.649
2002	765	0.750	0.673
2003	811	0.801	0.549
2004	896	0.797	0.480
2005	807	0.792	0.477
2006	694	0.787	0.388
2007	505	0.792	0.315
Total	8,527	0.788	0.610

Notes: This table shows the frequency of different covenant types for Dealscan deals during the sample period 1996 to 2007. Panel A shows the frequency of each individual type of covenant. Panel B shows the frequency of the two covenant classes. The INCOME STATEMENT covenant class includes Interest Coverage, Fixed Charge Coverage, and Debt-to-Earnings covenants. The BALANCE SHEET covenant class includes Leverage, Net Worth, and Current Ratio covenants.

3.2. Measuring balance sheet focus

I predict that firms that are more subject to balance sheet-based accounting rules, either through their industry, business, or investment opportunity set, are less likely to have balance sheet covenants in their loans. In this section I develop the study's empirical measure for exposure to balance sheet-based accounting rules: the Volatility Ratio (VR).

Ideally, I would identify all assets that are subject to balance sheet adjustments. Then, based on the type of asset, I would predict the frequency and value range (i.e. distribution) of adjustments. For example, investment securities have frequent adjustments (due to mark-to-market), with the magnitude of the adjustments varying based on the volatility of the asset's value. For fixed assets, adjustments in the form of impairments are less frequent, but could potentially be large depending on original purchase price of the asset and economic trends. I would measure the extent of balance sheet focus based on the expected frequency and distribution of adjustments for the firm's portfolio of assets: firms subject to frequent and widely distributed adjustments would be classified as high balance sheet focus, and firms with infrequent adjustments within a narrow range of values would be characterized as low balance sheet focus.

There are two problems that cause me to deviate from the ideal measure described above. First, although it is relatively easy (on a conceptual level) to identify assets and liabilities that are subject to balance sheet adjustments, it is less clear what is the best way to measure the expected frequency and magnitude of adjustments. Second, due to constraints in Compustat's structuring of data items, it is difficult to separate balance sheet adjustments (i.e. fair value adjustments, other balance sheet adjustments) from non-adjustment items. In the remainder of this section I define my measure of balance sheet focus, Volatility Ratio, and discuss how its measurement mitigates these two problems.

Table 2
Measuring balance sheet focus.

	Mean	Standard deviation	Minimum	1st quartile	Median	3rd quartile	Maximum
Book value volatility	151.073	367.236	0.130	8.491	28.463	111.015	3,071.220
Adjusted net income volatility	129.782	287.208	0.112	10.101	33.877	108.444	2,997.970
Volatility ratio	1.922	3.645	0.050	0.452	0.885	1.821	36.766

Notes: This table presents summary statistics on the study's main empirical measure of balance sheet focus, the Volatility Ratio. Variables are based on quarterly Compustat. All quarterly variables are annualized by summing the current and three prior quarterly observations. BOOK VALUE VOLATILITY is the five-year standard deviation of changes in retained earnings (REQ) plus dividends (DVPSPQ × CSHOQ). ADJUSTED NET INCOME VOLATILITY is the five-year standard deviation of Net Income (NIQ) minus Special Items (SPIQ) and Non-Operating Income and Expense (NOPIQ). VOLATILITY RATIO is the ratio of Book Value Volatility to Adjusted Net Income Volatility.

I define Volatility Ratio (VR):

$$VR = \frac{\text{Book Value Volatility}}{\text{Adjusted Net Income Volatility}} \quad (4)$$

Book value volatility is the five-year standard deviation of the change in book value (ΔBV). The change in book value is the change in retained earnings (REQ) with the annualized dividend (DVPSPQ × CSHOQ) added back. REQ includes three components: unadjusted retained earnings (REUNAQ), cumulative net income less dividends; accumulated other comprehensive income (ACOMINCQ); and other shareholders' equity (SEQOQ). Measured this way, ΔBV captures all non-capital (i.e. equity issuance/repurchase, dividends) changes in shareholders' equity, including changes that do not articulate through the income statement. Adjusted net income volatility is the five-year standard deviation of net income (NIQ) minus special items (SPIQ) and non-operating income and expense (NOPIQ). Summary statistics on VR are shown in Table 2, with variable definitions in Appendix C.

VR has the entire change in book value (ΔBV) in the numerator, but only adjusted net income in the denominator. This formulation allows the ratio to measure adjustments controlling for the ongoing operations (i.e. adjusted net income) of the firm. To illustrate, return to Eq. (3):

$$\Delta BV = \text{adjusted net income} + \text{other income} + \text{dirty surplus} \quad (5)$$

Adjustments can be part of other income or dirty surplus, but not adjusted net income. I combine other income and dirty surplus and rewrite Eq. (5) as:

$$\Delta BV = \text{adjusted net income} + \text{adjustments} \quad (6)$$

It follows from Eq. (6) that, holding adjusted net income equal, higher adjustments will result in higher changes in book value. However, using the level (or the absolute value of the level) does not necessarily capture the full impact of adjustments. Specifically, a firm may be subject to significant adjustments (i.e. have many assets that could have large adjustments) but in any specific period have a total adjustment close to zero. Hence, using the level may provide an unclear picture of the distribution of adjustments. To better capture the distribution, I use the variance:

$$\text{var}(\Delta BV) = \text{var}(\text{adjusted net income} + \text{adjustments}) \quad (7)$$

Similar to the level in Eq. (6), if adjustments are large relative to adjusted net income the variance of change in book value will also be relatively large. This is especially true since adjustments are transient relative to adjusted net income.¹⁷ It is important to note that the variance is affected by the covariance between adjusted net income and adjustments:

$$\text{var}(\Delta BV) = \text{var}(\text{adjusted net income}) + \text{var}(\text{adjustments}) + 2 \times \text{covar}(\text{adjusted net income}, \text{adjustments}) \quad (8)$$

Empirically, adjusted net income and adjustments are independent,¹⁸ so Eq. (8) reduces to:

$$\text{var}(\Delta BV) = \text{var}(\text{adjusted net income}) + \text{var}(\text{adjustments}) \quad (9)$$

Scaling Eq. (9) by the variance of adjusted net income controls for the continuing operations of the firm, hence isolating the effects of adjustments.

The above analysis assumes that adjustments can be easily separated from items that are not adjustments. In practice, such separation is difficult, as Compustat often groups adjustments and non-adjustments into single data items. To the extent that measured adjustments include non-adjustment items, VR is measured with noise. In Appendix B, I explore the seriousness of this measurement error. To start, the first section provides a decomposition of the change in book value. As shown in Eq. (B4), four Compustat data items contain adjustments: special items (SPIQ), non-operating income and expense (NOPIQ), change in accumulated other comprehensive income (ACOMINCQ), and change in other equity (SEQOQ).

Each of these accounts includes adjustment and non-adjustment items. For example, special items includes several adjustments, such as goodwill and fixed asset impairment write-offs and restructuring charges. However, other special

¹⁷ Unreported analysis shows that the persistence of adjustments is low ($\rho=0.20$) relative to that of adjusted net income ($\rho=0.80$). This makes it unlikely that adjustments will maintain a high level but a low variance.

¹⁸ The correlation (unreported) between adjustments and adjusted net income is 0.015, which is not significantly different from zero.

items, such as acquisitions and gains and losses on asset sales, are not adjustments. Similarly, both non-operating income and expense and accumulated other comprehensive income include both adjustment and non-adjustment items.¹⁹ Due to how Compustat defines these data items, I cannot separate adjustment from non-adjustment items. The second section of [Appendix B](#) provides a detailed analysis of each data item and its limitations using Compustat data, including estimates on the proportion of each data item that are adjustments. The results shows that items classified as adjustments make up a large part of these data items. I also examine the correlation between VR and the estimated aggregate amount of fair value adjustments, other balance sheet adjustments, and non-adjustment items. I find that VR has the strongest association with other balance sheet adjustments, followed closely by fair value adjustments; the weakest correlation is with non-adjustment items. Based on the data in [Appendix B](#), I conclude that VR, though a noisy measure, is more closely associated with adjustments than with non-adjustment items. This provides support for the use of VR as a measure of balance sheet focus.

4. Empirical tests and results

4.1. Volatility ratio and covenant inclusion

I begin the analysis by measuring the level of VR for firms in the private loan sample, shown in [Table 3](#). The table shows that the mean (median) VR is increasing over time, with a low of 1.486 (0.550) to a high of 2.622 (1.087), a statistically significant trend (mean: slope 0.077, *t*-statistic 3.80; median: slope 0.043, *t*-statistic 5.24). VR is likely related to various firm characteristics. To ensure that any relation between VR and covenant change is not related to omitted firm characteristics, I measure VR controlling for firm features using the following OLS regression:

$$VR_i = \alpha + \beta_1 \left(\frac{EBITDA_i}{TA_i} \right) + \beta_2 \text{Leverage}_i + \beta_3 \text{MB}_i + \beta_4 \text{EDF}_i + \beta_5 \text{Size}_i + \varepsilon_i$$

The residual from this regression (VR-Orthogonal) measures the extent of balance sheet focus controlling for firm features. Consistent with VR, the mean value of VR-Orthogonal is increasing over time (slope 0.058, *t*-statistic 3.74). Annual data on VR-Orthogonal and the firm characteristics are presented in [Table 3](#), Panel B.

To further examine the relation between VR and covenant inclusion, I contrast the level of the ratio over time for deals using different types of covenants. This test explores whether cross-sectional variation in the ratio is associated with covenant inclusion. I compare the level of VR for firms with income statement covenants (first column) and firms with balance sheet covenants (second column). I anticipate that firms with balance sheet covenants will on average have lower VR. Additionally, if the effects of the balance sheet approach are increasing over time, the difference should also be increasing.

The results are shown in [Table 3](#), Panel C. Over the entire sample period, the mean VR for borrowers with income statement covenants (1.894) is significantly higher than that of borrowers with balance sheet covenants (1.601, a difference of 0.293, *t*-statistic 4.07). As VR has a skewed distribution, I also test the difference in medians and find similar results (a difference of 0.084, *p*-value < 0.0001). On a yearly basis, the VR for borrowers with income statement covenants is significantly higher in both the mean and median in four of the final five sample years, consistent with the effect increasing over time. The mean VR for firms with income statement covenants increases over the sample period (slope 0.087, *t*-statistic 4.61) but is statistically not different from zero for firms with balance sheet covenants (slope 0.014, *t*-statistic 0.94).

4.2. Regression tests

I code each deal-observation with two dichotomous response variables: IS COVENANT has a value of one if the observation has an income statement covenant and zero otherwise; BS COVENANT has a value of one if the observation has a balance sheet covenant, and zero otherwise. The choices to have income statement or balance sheet covenants are likely not made independently; underlying borrower features dictate the set of provisions attached to the loan, including the choice of financial covenants.²⁰ Due to the endogenous nature of financial covenant portfolios, I estimate the following bivariate probit regression:

$$(\text{IS Covenant}_i, \text{BS Covenant}_i) = f(\alpha + \beta \text{VR}_i + \Gamma \text{Controls}_i + \varepsilon_i)$$

This specification allows me to test the association between VR and the inclusion of the two types of covenants when the errors in the separate regressions are potentially correlated. The estimation yields separate sets of coefficients for IS Covenant and BS Covenant, but accounts for correlation in their determination. Since the ratio is skewed, in the regressions I use the natural logarithm of VR.

¹⁹ I do not analyze other shareholders' equity (SEOOQ), as this data item is on average less than 0.1% of total assets for sample firms and is thus immaterial.

²⁰ The univariate correlation between IS Covenant and BS Covenant is insignificant ($\rho = 0.013$); however, this does not take into account other firm features that may jointly determine covenant use.

Table 3
Volatility ratio and the debt sample.

<i>Panel A: Volatility ratio level by year</i>						
Year	Observations	Mean volatility ratio		Median volatility ratio		
1996	465	1.865		0.811		
1997	487	1.496		0.655		
1998	395	1.486		0.550		
1999	389	1.590		0.700		
2000	402	1.440		0.658		
2001	489	1.984		0.806		
2002	567	1.739		0.933		
2003	620	1.861		0.967		
2004	725	2.138		1.007		
2005	640	2.271		1.087		
2006	549	2.622		1.011		
2007	407	2.103		1.068		
Total	6,135	1.922		0.885		

<i>Panel B: VR and firm characteristics</i>							
	Observations	VR-orthogonal	Size	Leverage	Market-to-book	EBITDA	EDF
1996	390	-0.125	5.633	0.316	1.729	0.150	0.029
1997	417	-0.278	5.853	0.304	1.769	0.153	0.026
1998	332	-0.360	5.663	0.326	1.688	0.154	0.035
1999	322	-0.166	5.969	0.338	1.635	0.149	0.035
2000	346	-0.282	6.263	0.340	1.662	0.141	0.051
2001	432	-0.080	6.119	0.330	1.637	0.133	0.069
2002	488	-0.011	6.185	0.327	1.536	0.128	0.059
2003	538	0.055	6.480	0.325	1.554	0.123	0.041
2004	645	0.197	6.837	0.308	1.662	0.143	0.012
2005	561	0.216	7.222	0.287	1.719	0.133	0.004
2006	478	0.271	7.309	0.275	1.831	0.142	0.005
2007	368	0.169	7.567	0.278	1.954	0.151	0.007
Total	5,317	-0.001	6.488	0.311	1.692	0.141	0.030

<i>Panel C: Volatility ratio by covenant type usage</i>					
Year		Mean (median) VR-income statement covenant deals	Mean (median) VR-balance sheet covenant deals	Difference	t-Statistic (p-value) of difference
1996	Mean	1.811	1.809	0.002	0.01
	Median	0.769	0.820	-0.051	0.2034
1997	Mean	1.452	1.402	0.050	0.25
	Median	0.618	0.659	-0.041	0.1564
1998	Mean	1.441	1.437	0.004	0.02
	Median	0.529	0.567	-0.038	0.1688
1999	Mean	1.365	1.501	-0.136	-0.52
	Median	0.672	0.679	-0.007	0.2678
2000	Mean	1.514	1.333	0.181	0.62
	Median	0.627	0.624	0.003	0.4135
2001	Mean	1.755	1.883	-0.127	-0.46
	Median	0.749	0.713	0.036	0.4240
2002	Mean	1.747	1.630	0.117	0.54
	Median	0.917	0.834	0.083	0.2456
2003	Mean	1.903	1.542	0.361*	1.82
	Median	0.967	0.889	0.078*	0.0529
2004	Mean	2.243	1.776	0.466*	1.89
	Median	1.012	0.873	0.139***	0.0022
2005	Mean	2.232	1.519	0.713***	3.42
	Median	1.059	0.889	0.170***	0.0026
2006	Mean	2.565	1.574	0.991***	3.74
	Median	0.960	0.848	0.112***	0.0064
2007	Mean	2.167	1.832	0.335	1.07
	Median	1.071	0.851	0.220	0.1682
Total	Mean	1.894	1.601	0.293***	4.07
	Median	0.858	0.774	0.084***	< 0.0001

Notes: This table presents the annual statistics on Volatility Ratio. Panel A presents annual levels of Volatility Ratio by year. Panel B presents the yearly data on VR-ORTHOGONAL, the residual from the OLS regression of VR on Size, Leverage, Market-to-Book, EBITDA, and EDF, and these firm characteristics. Panel C presents the annual differences in Volatility Ratio (VR) based on covenant use. The first column, MEAN (MEDIAN) VR-INCOME STATEMENT DEALS is the mean (median) level of VR for deals with at least one income statement-based covenant (interest coverage, fixed charge coverage, debt-to-earnings). MEAN (MEDIAN) VR-BALANCE SHEET DEALS is the mean (median) level of VR for deals with at least one balance sheet-based covenant (leverage, net worth, current ratio). DIFFERENCE is the difference in means (medians) between the two groups, and t-statistic (p-value) tests the significance of this difference using a t-test (Wilcoxon test). *** and * indicate a statistically significant difference at the 1% and 10% levels, respectively.

In addition to testing the influence of VR on covenant inclusion, I examine three alternative explanations in the regressions: changes in borrower asset base, use of operating leases, and changes in the syndicated loan market. The balance sheet is most informative for firms with many fixed assets. For firms with many intangible assets—such as R&D investments or growth opportunities—the balance sheet provides relatively little information. I measure the asset composition of the borrower with ASSET TANGIBILITY, the ratio of the borrower's property, plant, and equipment to total assets (as in Wittenberg-Moerman, 2009). I expect a positive coefficient on Asset Tangibility in the balance sheet regression, as higher levels of this variable indicate more fixed assets.

Operating leases grant the holder property rights to assets, but GAAP requires the acquisition cost to be immediately expensed rather than capitalized on the balance sheet. High levels of operating leases may diminish the contracting value of the balance sheet, as assets under the borrower's control are not recognized on the balance sheet. I capture the magnitude of operating leases following Ge (2006):

$$\text{LEASES} = \left(\frac{\text{MRC1}}{(1.1)} + \frac{\text{MRC2}}{(1.1)^2} + \frac{\text{MRC3}}{(1.1)^3} + \frac{\text{MRC4}}{(1.1)^4} + \frac{\text{MRC5}}{(1.1)^5} \right) / \text{Total Assets}$$

MRC1 through MRC5 are the rental payments due in years one through five. Similar to Ge (2006), I use a 10% discount rate and exclude the terminal value from the calculation. The magnitude of operating leases fluctuates over the sample period, with a high of 8.9% in 2002 and a low of 6.6% in 2006. I predict a negative coefficient on leases in the balance sheet regression.

A third alternative explanation for the decline in balance sheet covenants is changes in the syndicated loan market. The 1990s saw two significant changes. First, loans started to be securitized in greater numbers (Benmelech et al., 2009). Second, an active secondary market for loans emerged (Wittenberg-Moerman, 2008; Drucker and Puri, 2009). Unlike in the past, when the original lender retained much of the loan, securitization and secondary market trading allow lenders to pass on a large share of the loan (and the accompanying risk) to investors. This may change the lenders' incentives to include financial covenants in loans. Evidence in Drucker and Puri (2009) shows that loans with net worth covenants are less likely to be sold than other loans.

The Dealscan database does not provide data on which deals are sold on the secondary market or securitized. Following Wittenberg-Moerman (2008), I use the presence of an institutional loan tranche as a proxy for these secondary activities. Term loan tranches titled B and higher are generally issued to institutional investors, and are much more likely to be traded on the secondary market and securitized.²¹ Dealscan provides the number and types of facilities in each loan package, allowing identification of the institutional tranche. I identify which packages have an institutional tranche, and code INSTITUTIONAL TRANCHE INDICATOR to one for these observations. The frequency of institutional tranches increased over the sample period, from 4.7% in 1996 to 16.4% in 2007. I expect a negative coefficient on Institutional Tranche Indicator in the balance sheet regression.

I include additional control variables. Borrower-level controls include operating earnings scaled by average total assets (EBITDA), debt-to-asset ratio (LEVERAGE), growth opportunities (MARKET-TO-BOOK), the expected default frequency based on the Merton (1974) model (EDF), and the natural logarithm of the market value of equity (SIZE). I include the number of lenders as a control (SYNDICATE SIZE). I include three other loan-level provisions: indicators for provisions restricting capital expenditures (CAPEX RESTRICTION), performance pricing (PERFORMANCE PRICING), and collateral requirements (COLLATERAL). I also control for the borrower's covenant portfolio in their prior deal, with separate indicators for income statement (IS COVENANT IN PRIOR DEAL) and balance sheet (BS COVENANT IN PRIOR DEAL) covenants. Financial covenant inclusion is persistent, and these indicators may capture information not in the other controls. Finally, I include industry and year fixed effects. Since many firms have multiple deals in the sample period, Z-statistics are estimated with clustering by firm and year.

Estimation results with coefficients and robust Z-statistics are presented in Table 4. Consistent with prediction, the coefficient on VR in the BS Covenant regression is negative and significant. In contrast, the coefficient on VR in the IS Covenant regression is negative but not significantly different from zero. There is also evidence consistent with other explanations of balance sheet covenant use. The coefficient on Asset Tangibility is positive and significant, consistent with borrower asset base affecting the selection of financial covenants. Leases has a negative and significant coefficient in both the income statement and balance sheet regressions, suggesting off-balance sheet financing reduces the overall usefulness of financial statements. The coefficient on Institutional Tranche Indicator is negative and significant in the balance sheet regression, indicating that changes in the syndicated loan market are associated with a decline in balance sheet covenant use. Interestingly, the coefficient in the income statement regression is significantly positive.

The results in Table 4 are consistent with the hypothesis that the shift to the balance sheet approach, and the accompanying increase in balance sheet adjustments, is associated with less frequent use of balance sheet covenants. The results also support various alternative explanations for the change in covenant use, consistent with accounting standards explaining some, but not all, of the change in use of balance sheet covenants. In terms of economic significance,

²¹ In the sample used in Wittenberg-Moerman (2008), institutional loans comprise 35% of the traded loan sample, but only 4% of the non-traded loans.

Table 4
Bivariate probit regressions.

	Dependent variable	
	IS covenant	BS covenant
VR	−0.023	−0.051**
	(−0.86)	(−2.48)
Asset tangibility	−0.546**	0.511***
	(−2.51)	(3.26)
Leases	−0.909**	−1.084***
	(−2.00)	(−3.08)
Institutional tranche indicator	0.434***	−0.554***
	(3.51)	(−4.47)
IS covenant in prior deal	1.514***	−0.437***
	(21.26)	(−5.46)
BS covenant in prior deal	−0.402***	1.449***
	(−4.86)	(16.02)
EBITDA	3.094***	0.716**
	(5.24)	(2.30)
Leverage	−0.564***	−0.570***
	(−3.70)	(−2.93)
Market-to-book	0.019	−0.083*
	(0.34)	(−1.88)
EDF	0.001	0.038***
	(0.06)	(2.78)
Size	−0.161***	−0.078***
	(−4.99)	(−3.32)
Syndicate size	0.193***	−0.021
	(6.08)	(−0.59)
Capex restriction	0.216	−0.212***
	(1.51)	(−2.93)
Performance pricing	0.562***	0.216***
	(7.16)	(2.72)
Collateral	0.106	−0.130***
	(0.98)	(−2.57)
Constant	0.667**	0.461
	(2.01)	(1.00)
Year/industry fixed effects	Included	Included
Observations	3,515	3,515

Notes: This table presents bivariate probit regression results. IS COVENANT is an indicator variable with a value of one if a loan contract has an interest coverage, fixed charge coverage, or debt-to-earning covenant, and zero otherwise. BS COVENANT is an indicator variable with a value of one if a loan contract has a leverage, net worth, or current ratio covenant, and zero otherwise. VR is the natural logarithm of the Volatility Ratio, the ratio of book value volatility to adjusted net income volatility. ASSET TANGIBILITY is the ratio of property, plant, and equipment to total assets. LEASES is the sum of discounted future operating lease payments (MRC1–MRC5) scaled by average total assets. INSTITUTIONAL TRANCHE INDICATOR is a variable taking a value of one if the deal has a Term Loan B or higher. IS COVENANT IN PRIOR DEAL and BS COVENANT IN PRIOR DEAL are indicators with values of one if an income statement or balance sheet covenant was used in the borrower's most recent deal, and zero otherwise. EBITDA is operating earnings scaled by average total assets. LEVERAGE is long-term debt scaled by total assets. MARKET-TO-BOOK is the market value of assets scaled by the book value of assets. EDF is the expected frequency of default, based on Merton (1974). SIZE is the natural logarithm of the market value of equity. SYNDICATE SIZE is the natural logarithm of the number of lenders in the syndicate for the loan. CAPEX RESTRICTION is an indicator for if the deal has a covenant restricting capital expenditures. PERFORMANCE PRICING is an indicator for if the deal's interest spread is tied to firm performance. COLLATERAL is an indicator for if the deal requires collateral. Each regression includes indicators for year and industry. Z-statistics are clustered by firm and year. All variables except Volatility Ratio and the indicator variables are winsorized at the top and bottom 1%. ***, **, and * indicate statistical significance at the 1%, 5% and 10% levels.

a one standard deviation increase in VR is associated with a 2.3% lower likelihood of having a balance sheet covenant.

4.3. Alternative specifications

4.3.1. Multinomial response specification

In the main tests, deals are sorted into two categories: with income statement covenants, and with balance sheet covenants. Many deals, particularly those early in the sample period, include both types of covenants. To further assess the nature of covenant portfolios, I sort deals into four mutually exclusive combinations: Income Statement (IS) Only, Balance Sheet (BS) Only, Neither, and Both. Yearly data are presented in Table 5, Panel A. The number of deals with Neither type of

covenant increased over the early part of the sample period, consistent with the “Cov Lite” trend noted in the practitioner press (Teshler, 2007; McManus, 2007). There is a decline in deals with Both, and an increase in deals with IS Only.

I run a multinomial probit regression with the covenant combination as the response. Using Neither as the base case, the multinomial probit measures the association between a specific combination and the explanatory variables. I expect a negative coefficient on VR in the BS Only and Both specifications, with no prediction for IS Only. The controls are similar as in prior tests,

Table 5
Covenant combinations.

Panel A: Covenant combinations									
Year	Covenant combination by deal					Covenant combination: percentage			
	Neither	IS only	BS only	Both	Total	Neither	IS only	BS only	Both
1996	1	129	145	480	755	0.001	0.171	0.192	0.636
1997	5	143	159	487	794	0.006	0.180	0.200	0.613
1998	13	138	98	371	620	0.021	0.223	0.158	0.598
1999	29	141	74	321	565	0.051	0.250	0.131	0.568
2000	32	167	114	290	603	0.053	0.277	0.189	0.481
2001	61	189	125	337	712	0.086	0.265	0.176	0.473
2002	64	186	127	388	765	0.084	0.243	0.166	0.507
2003	59	307	102	343	811	0.073	0.379	0.126	0.423
2004	76	390	106	324	896	0.085	0.435	0.118	0.362
2005	55	367	113	272	807	0.068	0.455	0.140	0.337
2006	58	367	90	179	694	0.084	0.529	0.130	0.258
2007	46	300	59	100	505	0.091	0.594	0.117	0.198
Total	499	2,824	1,312	3,892	8,527	0.059	0.331	0.154	0.456

Panel B: Multinomial probit regression results

	Dependent variable		
	IS only	BS only	Both
VR	0.025	-0.123*	-0.152**
	(0.40)	(-1.82)	(-2.49)
Asset tangibility	-1.410***	0.599	-0.379
	(-2.65)	(1.18)	(-0.69)
Leases	-2.072***	-3.522***	-3.853***
	(-2.81)	(-3.97)	(-4.02)
Institutional tranche indicator	0.829**	-1.790**	-0.084
	(2.50)	(-2.44)	(-0.20)
IS covenant in prior deal	2.170***	-0.454	0.703*
	(6.14)	(-1.28)	(1.90)
BS covenant in prior deal	0.124	2.830***	1.077***
	(0.40)	(8.65)	(4.24)
Both in prior deal	1.538***	1.373***	2.967***
	(6.68)	(5.68)	(10.02)
EBITDA	4.336***	-0.918	5.439***
	(3.47)	(-0.85)	(4.48)
Leverage	-0.673	-0.836	-1.401***
	(-1.35)	(-1.21)	(-2.84)
Market-to-book	0.126	0.041	0.028
	(1.07)	(0.19)	(0.17)
EDF	0.102***	0.138***	0.068**
	(3.61)	(3.13)	(2.04)
Size	-0.266***	-0.104*	-0.472***
	(-4.28)	(-1.69)	(-5.79)
Syndicate size	0.512***	0.227*	0.469***
	(4.98)	(1.84)	(4.83)
Capex restriction	0.148	-0.910**	-0.281
	(0.47)	(-2.44)	(-0.84)
Performance pricing	1.055***	0.280	1.217***
	(5.39)	(1.40)	(5.29)
Collateral	-0.126	-0.650**	-0.449**
	(-0.70)	(-2.16)	(-2.42)
Constant	0.402	-0.280	1.886***
	(0.58)	(-0.32)	(2.74)
Year fixed effects	Included	Included	Included
Observations	3,515	3,515	3,515

Table 5 (continued)

	Dependent variable		
	IS only	BS only	Both
Wald tests of equality of coefficient on VR between categories	Test	χ^2 Statistic	p-Value
	IS only=BS only	6.75	0.0094***
	IS only=Both	47.11	< 0.0001***
	BS only=Both	0.98	0.3220

Notes: This table presents test results based on sorting deals into four mutually exclusive Covenant Combinations. Deals in the NEITHER category include neither an income statement nor a balance sheet covenant. IS ONLY deals include at least one income statement covenant (interest coverage, fixed charge coverage, debt-to-earnings) but no balance sheet-based covenants. BS ONLY deals include at least one balance sheet covenant (leverage, net worth, current ratio) but no income statement-based covenants. BOTH deals include at least one covenant from both the income statement and the balance sheet. Panel A presents the number (in the left-hand columns) and percentages (in the right-hand columns) of each combination. Panel B presents multinomial probit regression, with Neither covenant as the base case. VR is the natural logarithm of the Volatility Ratio, the ratio of book value volatility to adjusted net income volatility. ASSET TANGIBILITY is the ratio of property, plant, and equipment to total assets. LEASES is the sum of discounted future operating lease payments (MRC1–MRC5) scaled by average total assets. INSTITUTIONAL TRANCHE INDICATOR is a variable taking a value of one if the deal has a Term Loan B or higher. IS ONLY IN PRIOR DEAL, BS ONLY IN PRIOR DEAL, and BOTH IN PRIOR DEAL are indicators with values of one if the borrower's most recent deal was IS Only, BS Only, or Both, respectively, and zero otherwise. EBITDA is operating earnings scaled by average total assets. LEVERAGE is long-term debt scaled by total assets. MARKET-TO-BOOK is the market value of assets scaled by the book value of assets. EDF is the expected frequency of default, based on Merton (1974). SIZE is the natural logarithm of the market value of equity. SYNDICATE SIZE is the natural logarithm of the number of lenders in the syndicate for the loan. CAPEX RESTRICTION is an indicator for if the deal has a covenant restricting capital expenditures. PERFORMANCE PRICING is an indicator for if the deal's interest spread is tied to firm performance. COLLATERAL is an indicator for if the deal requires collateral. Each regression includes indicators for year. Z-statistics are clustered by firm and year. All variables except Volatility Ratio and the indicator variables are winsorized at the top and bottom 1%. ***, **, and * indicate statistical significance at the 1%, 5% and 10% levels.

though I replace the two indicators for prior covenant use with three: IS Only, BS Only, and Both. The results are shown in Table 5, Panel B. The coefficient on VR for IS Only is positive but insignificant. It is negative and significant for BS Only and Both. At the bottom of the panel I provide tests of differences in the coefficient on VR across the three responses. I find that the coefficients differ significantly between IS Only and BS Only and between IS Only and Both. However, there is no difference statistically between the coefficient in BS Only and Both. The evidence on alternative explanations is mixed relative to Table 4. The coefficient on Leases is negative and significant in the BS Only and Both regressions. However, Institutional Tranche Indicator only has a negative and significant coefficient in the BS Only regression, and Asset Tangibility is insignificant in both.

4.3.2. Changes specification

Many borrowers access the private debt market multiple times over the sample period. I summarize the deals per borrower in Table 6, Panel A. The 8,527 deals are made to 3,016 borrowers. Of these borrowers, 1,031 have a single deal in the sample period, while the remaining 1,985 have between two and 17 deals. New Deals is the total number of new debt contracts over the sample period, i.e. subsequent deals for the firms that already had a private deal previously in the sample period. For example, a firm with a total of three debt contracts has two New Deals. There are a total of 5,511 New Deals. Table 6, Panel B shows the distribution of New Deals over time.

I exploit the data in New Deals to measure changes in covenant structure on a borrower-specific basis. This allows me to measure how deals are evolving and to use the firm essentially as a control for itself. A transition matrix showing these changes is presented in Table 6, Panel C. The vertical axis shows the Old Covenant Combination: "Old" refers to the initial covenant structure. On the horizontal axis is the New Covenant Combination; this is the covenant structure for the New Deal. On average, a firm does not change enough to warrant a different set of covenants from one deal to the next. Hence, I expect the majority of observations to fall on the diagonal. This is true for IS Only (60.6%), BS Only (51.0%), and Both (63.0%), but not Neither (21.7%, with 32.9% transitioning to IS Only and Both).

I categorize the 5,511 New Deal observations based on the nature of the change (increasing, maintaining, or decreasing) in income statement and balance sheet covenants. For each covenant type, the change classes are mutually exclusive. I define an "increasing" change as one that adds a covenant in the New Deal. For example, if the borrower's old deal was BS Only, an income statement increasing change would be either IS Only or Both.²² "Maintaining" have the same covenant

²² Since changes are measured for income statement and balance sheet covenants separately, I measure them independently. In the example above, a change from BS Only to IS Only or Both is classified as income statement increasing; the fact that an income statement covenant was added drives the change, regardless of the balance sheet covenant. From the same example, if the new deal has IS Only it would be classified as balance sheet decreasing, while the new deal being Both would be classified as balance sheet maintaining.

types between deals, while a “decreasing” change means a covenant was included in the prior deal but excluded from the new one. Increases in income statement covenants are more frequent than decreases (9.3% increases, 6.6% decreases), while decreases are more common for balance sheet covenants (7.1% increases, 13.4% decreases). I define two Aggregate Change variables. Aggregate Change-IS is coded to negative one for a decrease in income statement covenants, zero for a maintaining transition, and one for an increasing transition. Aggregate Change-BS is coded similarly based on changes in balance sheet covenants. Using the two Aggregate Change variables, I run the following ordered bivariate probit

Table 6
Firm-level covenant changes.

Panel A: Deals and changes by borrower

Deals per firm	Observations	Total deals	New deals
1	1,031	1,031	0
2	658	1,316	658
3	470	1,410	940
4	314	1,256	942
5	208	1,040	832
6	152	912	760
7	71	497	426
8	45	360	315
9	28	252	224
10	14	140	126
11	11	121	110
12	2	24	22
13	8	104	96
14	0	0	0
15	1	15	14
16	2	32	30
17	1	17	16
Total	3,016	8,527	5,511

Panel B: Distribution of new deals by year

Year	New deals	New deals as % of total
1996	62	0.082
1997	261	0.329
1998	316	0.510
1999	319	0.565
2000	394	0.653
2001	473	0.664
2002	560	0.732
2003	670	0.826
2004	740	0.826
2005	697	0.864
2006	573	0.826
2007	446	0.883
Total	5,511	0.646

Panel C: Transition Matrix

		New covenant combination					Row total
		Neither	IS only	BS only	Both		
Old covenant combination	Neither	Observations	76	115	44	115	350
		Row %	21.7	32.9	12.6	32.9	
	IS only	Observations	134	1,248	125	553	2,060
		Row %	6.5	60.6	6.1	26.8	
	BS only	Observations	49	112	380	204	745
		Row %	6.6	15.0	51.0	27.4	
	Both	Observations	93	586	194	1,483	2,356
		Row %	4.0	24.9	8.2	63.0	
Column total			350	2,061	743	2,355	5,511

Table 6 (continued)

	Dependent variable	
	Aggregate change-IS	Aggregate change-BS
VR	0.012	–0.044**
	(0.65)	(–2.08)
Asset tangibility	–0.073	0.101
	(–0.78)	(1.28)
Leases	–0.460***	–0.308
	(–3.19)	(–1.57)
Institutional tranche indicator	0.084	–0.305***
	(1.04)	(–3.04)
EBITDA	0.584**	0.183
	(2.27)	(1.35)
Leverage	–0.350***	0.335**
	(–3.80)	(2.23)
Market-to-book	–0.006	–0.033
	(–0.20)	(–1.40)
EDF	0.013	0.013*
	(1.26)	(1.83)
Size	–0.018	0.021
	(–0.82)	(1.17)
Syndicate size	0.100***	–0.002
	(4.52)	(–0.07)
Capex restriction	1.132*	–0.053
	(1.73)	(–0.97)
Performance pricing	0.201***	0.041
	(5.43)	(0.54)
Collateral	–0.019	–0.065*
	(–0.22)	(–1.67)
Year and industry fixed effects	Included	Included
Observations	3,515	3,515

Notes: This table presents tests results based on changes in covenant use. Panel A presents the frequency of deals per firm over the sample period. OBSERVATIONS is the number of borrowers per Deal group. TOTAL DEALS is the total number of deals per firm by sample incidence, and NEW DEALS is the number of new deals (deals subsequent to the initial deal by a borrower during the sample period). Panel B shows the number and percentage of New Deals by year. Panel C presents a transition matrix of changes in covenants based on the joint use of income statement and balance sheet covenants. OLD COVENANT COMBINATION is the covenant combination for the initial deal. NEW COVENANT COMBINATION is the covenant combination for the new deal of the initial firm. The matrix show shows the number of observations and the row percentage for each cell. Panel D presents ordered bivariate probit regression results. AGGREGATE CHANGE-IS measures the change in income statement covenants, where increasing observations receive a value of one, decreasing changes a value of negative one, and maintaining observations a value of zero. AGGREGATE CHANGE-BS measures the change in balance sheet covenants, coding increases, decreases, and maintaining observations similar to the analogous income statement measure. VR is the natural logarithm of the Volatility Ratio, the ratio of book value volatility to adjusted net income volatility. ASSET TANGIBILITY is the ratio of property, plant, and equipment to total assets. LEASES is the sum of discounted future operating lease payments (MRC1–MRC5) scaled by average total assets. INSTITUTIONAL TRANCHE INDICATOR is a variable taking a value of one if the deal has a Term Loan B or higher. EBITDA is operating earnings scaled by average total assets. LEVERAGE is long-term debt scaled by total assets. MARKET-TO-BOOK is the market value of assets scaled by the book value of assets. EDF is the expected frequency of default, based on Merton (1974). SIZE is the natural logarithm of the market value of equity. SYNDICATE SIZE is the natural logarithm of the number of lenders in the syndicate for the loan. CAPEX RESTRICTION is an indicator for if the deal has a covenant restricting capital expenditures. PERFORMANCE PRICING is an indicator for if the deal's interest spread is tied to firm performance. COLLATERAL is an indicator for if the deal requires collateral. Each regression includes indicators for year and industry. Z-statistics are clustered by firm and year. All variables except Volatility Ratio are winsorized at the top and bottom 1%. ***, **, and * indicate statistical significance at the 1%, 5% and 10% levels.

regression²³:

$$(\text{Agg}\Delta\text{IS}_i, \text{Agg}\Delta\text{BS}_i) = f(\alpha + \beta\text{VR}_i + \Gamma\text{Controls}_i + \varepsilon_i)$$

Regression results are presented in Table 6, Panel D. The coefficient on VR is negative and significant in the BS Covenant regression and insignificant in the IS Covenant test. The results show that when a firm changes the level of balance sheet covenant protection from one deal to the next, this change is associated with the extent of balance sheet focus in their

²³ Ordered bivariate probit is similar to the dichotomous response bivariate probit, but allows for ordered response variables with more than two levels. See Sajaia (2008) for details.

reporting. The coefficients on Asset Tangibility, Leases, and Institutional Tranche Indicator all have the predicted signs, the latter two being significant.

4.4. Additional tests

4.4.1. Lender competition

The Gramm–Leach–Bliley Act in 1999 effectively repealed the Glass–Steagall Act, revoking the separation between commercial and investment banking.²⁴ The period following Gramm–Leach–Bliley saw increased competition in banking, as evidenced by more participants in securities underwriting (Gande et al., 1999) and lower cost of debt in both the public and private debt market (Drucker and Puri, 2005). Ruckes (2004) models how increased competition leads to lower monitoring by banks in commercial lending, as lenders seek to retain existing clients and attract new ones. Lenders loosening credit standards in response to increasing competition provides an alternative explanation of the pattern in balance sheet covenant inclusion.

Different types of banks have responded differently to increasing competition and changing regulation. Wilmarth (2002) argues that the largest banks (e.g. Citigroup, Bank of America) chose a course of acquisition in order to maximize market share and become “too big to fail”. Following this strategy, these banks may have chosen to offer favorable terms to potential clients to gain their business; this could include removing covenants from debt contracts. In contrast to the large banks, which can afford increased credit losses as they become larger, smaller banks do not have similar incentives to loosen or remove covenants.

To examine the impact of competition, I sort borrowers into two groups based on the lead lender in the debt contract. Large Lenders comprise the eight largest lenders in the sample, and each is the lead lender on at least 3% of sample deals.²⁵ Small lenders include all other lenders. This classification reveals consolidation in the lending industry: the Large Lenders' aggregate annual share of loans rose from 41.5% to 86.1% over the sample period. I run the main regressions separately for borrowers with Large and Small Lenders, to assess the differences in the relation between VR and covenant inclusion where competition may be impacting lender incentives. If competition has changed the use of covenants, I expect deals from large lenders to display a weaker relationship between VR and balance sheet covenant use. In untabulated results, the coefficient on VR in each IS Covenant regression is insignificant, while it is negative and significant in the BS Covenant regression for Small Lenders (-0.093 , Z -statistic -2.68) and negative but insignificant for Large (-0.053 , Z -statistic -1.58). While the coefficient is less negative for Large Lenders, the difference is not statistically significant. This evidence suggests that changes in competition are not driving the decline in balance sheet covenants.

4.4.2. Time effects

The main regressions control for time using an indicator variable for the year of the deal. As a robustness check, I also run the main regression specification in annual cross-sections for 1997 through 2007.²⁶ Unlike the main tests using indicators for year, where only the intercept is allowed to vary, this test allows the coefficient on each variable to vary over time. In Table 7, I report the average coefficient across the 11 regressions with the Z -statistic based on the time-series standard error. Consistent with the results in Table 4, the coefficient on VR in the income statement regression is close to zero, while the coefficient in the balance sheet regression is negative and significant. These results suggest the relation between VR and covenant use is stable over the sample period and not driven by an unobserved time-varying factor.

4.4.3. Constant borrower sample

Another alternative explanation for the decline in balance sheet covenants is that the composition of the sample is changing over time. For example, borrowers early in the sample period may be more risky (thus requiring greater covenant protection) than borrowers later in the sample period. Similarly, borrowers early in the sample period may have asset bases composed of more fixed assets, making the balance sheet more efficient for contracting purposes. I attempt to control for these changes in the main tests using a variety of control variables, including proxies for growth opportunities, default risk, fixed assets, and operating leases. However, these controls may not be sufficient. Specifically, controls in regressions ignore the endogenous nature of accounting standards, in the sense that accounting standards may be set in response to changes in the characteristics of borrowers.

To address this potentially confounding explanation, I collect a constant sample of borrowers. I include firms with at least one loan prior to 1999 and at least one loan after 2004. This subsample comprises 75% of the full sample. Using the constant sample should mitigate concerns regarding differences in the characteristics of borrowers leaving and entering the private loan market over time. Untabulated results show that the coefficient on VR in the balance sheet regression is negative and significant (-0.073 , Z -statistic -2.87), indicating the main results hold for firms with a constant presence in the syndicated loan market.

²⁴ Wilmarth (2002) notes that, while Glass–Steagall was formally repealed in 1999, major provisions of the Act had been eroded over time, particularly with the 1998 merger of Citicorp and Travelers.

²⁵ The large banks are Bank of America, Bank One, Chase, Citigroup, Fleet, JP Morgan, NationsBank, and Wachovia.

²⁶ I exclude 1996, as there are only 42 observations.

Table 7
Annual cross-sectional regressions.

	IS covenant	BS covenant
VR	−0.037	−0.051^{***}
	(−0.64)	(−3.41)
Asset tangibility	−0.733 ^{**}	0.538 ^{***}
	(−2.52)	(3.77)
Leases	0.357	−1.549 ^{***}
	(0.43)	(−2.97)
Institutional tranche indicator	2.577 ^{***}	−0.423 ^{**}
	(2.61)	(−2.46)
IS covenant in prior deal	1.784 ^{***}	−0.435 ^{***}
	(18.04)	(−4.69)
BS covenant in prior deal	−0.526 ^{***}	1.677 ^{***}
	(−4.20)	(19.27)
EBITDA	4.009 ^{***}	−0.018
	(3.87)	(−0.03)
Leverage	−0.439	−0.646 ^{**}
	(−1.49)	(−2.26)
Market-to-book	0.012	−0.076
	(0.13)	(−1.33)
EDF	0.013	0.042 ^{***}
	(0.89)	(3.03)
Size	−0.189 ^{***}	−0.062
	(−4.27)	(−1.21)
Syndicate size	0.173 ^{***}	−0.033
	(2.61)	(−0.74)
Capex restriction	0.439	−0.032 ^{***}
	(0.94)	(−3.37)
Performance pricing	0.635 ^{***}	0.059
	(5.51)	(0.60)
Collateral	0.159	−0.127 [*]
	(1.52)	(−1.74)
Constant	0.388	0.124
	(1.51)	(0.29)
Observations	3,483	3,483

Notes: This table presents time-series average coefficients for 11 annual regressions (1997 to 2007). Z-statistics are calculated based on the time-series standard error of the coefficients. IS COVENANT is an indicator variable with a value of one if a loan contract has an interest coverage, fixed charge coverage, or debt-to-earning covenant, and zero otherwise. BS COVENANT is an indicator variable with a value of one if a loan contract has a leverage, net worth, or current ratio covenant, and zero otherwise. VR is the natural logarithm of the Volatility Ratio, the ratio of book value volatility to adjusted net income volatility. ASSET TANGIBILITY is the ratio of property, plant, and equipment to total assets. LEASES is the sum of discounted future operating lease payments (MRC1–MRC5) scaled by average total assets. INSTITUTIONAL TRANCHE INDICATOR is a variable taking a value of one if the deal has a Term Loan B or higher. IS COVENANT IN PRIOR DEAL and BS COVENANT IN PRIOR DEAL are indicators with values of one if an income statement or balance sheet covenant was used in the borrower's most recent deal, and zero otherwise. EBITDA is operating earnings scaled by average total assets. LEVERAGE is long-term debt scaled by total assets. MARKET-TO-BOOK is the market value of assets scaled by the book value of assets. EDF is the expected frequency of default, based on Merton (1974). SIZE is the natural logarithm of the market value of equity. SYNDICATE SIZE is the natural logarithm of the number of lenders in the syndicate for the loan. CAPEX RESTRICTION is an indicator for if the deal has a covenant restricting capital expenditures. PERFORMANCE PRICING is an indicator for if the deal's interest spread is tied to firm performance. COLLATERAL is an indicator for if the deal requires collateral. Z-statistics are clustered by firm and year. All variables except Volatility Ratio and the indicator variables are winsorized at the top and bottom 1%. ***, **, and * indicate statistical significance at the 1%, 5% and 10% levels.

4.4.4. Alternative measures of the impact of the balance sheet approach

I examine two alternative measures of VR. The first is the VR with industry-level adjusted net income volatility in the denominator. In the main tests, VR uses the firm-specific volatility of adjusted net income to scale the volatility of changes in book value. Using this alternative scalar allows for the possibility that the shocks affecting the entire industry (rather than just the firm) better captures the extent of balance sheet focus in the firm's accounting. Using industry-scaled VR in the main regressions yields a similar result as the firm-scaled: the coefficient in the balance sheet regression is negative and significant (untabulated: -0.112 , Z-statistic -5.39).

As a second alternative measure, I use VR-Orthogonal, as defined in Section 4.1. This measure controls for borrower characteristics that may influence the usefulness of covenants. The regression results using VR-Orthogonal are similar to the main results, with a negative and significant coefficient in the balance sheet regression (untabulated: -0.053 , Z-statistic -2.65).

4.5. Financial crisis period

I exclude years after 2007 from the sample due to the financial crisis. Among the consequences of the crisis was a constriction of credit (Brunnermeier, 2009). This credit crunch is evident for borrowers in the private debt market, where the number of loans in the crisis period (409 in 2008, 257 in 2009) is well below historical levels shown in Table 1. The reduction in supply of credit also has potential implications for contract design. Credit could be rationed to only the highest quality borrowers, who do not require covenants. Alternatively, lenders may demand stronger covenant packages for all lenders, even very high quality ones. The effect of the financial crisis on private debt contracting is therefore an empirical question; however, it is likely that factors beyond the characteristics of borrowers were affecting the design of contracts during this time period.

I investigate debt contract design during the years 2008 and 2009 to assess the impact of the crisis. While the number of loans declined sharply, financial covenant use did not change as dramatically. Income statement covenants were used in 73% and 75% of deals in 2007 and 2008 (a slight decline, but in line with past levels), while balance sheet covenants were included in 41% and 36% of deals (an increase from 2006 and 2007, but still low in historical terms). I also measure the VR, and find similar levels (2.188 in 2008, 2.157 in 2009) as in 2007 (2.103). These figures are lower than the levels in 2005 and 2006, but higher than historical averages.

I replicate Table 3, Panel C, comparing the difference in VR for borrowers with income statement covenants and with balance sheet covenants. The differences (0.581 in 2008, 0.716 in 2009) are statistically significant and consistent with the findings for earlier years. Finally, I replicate regression results (Tables 4–7) to ensure the empirical results are not significantly altered by inclusion of the crisis years. I find the empirical results are substantively identical using this extended sample, with the coefficients on VR having the same sign and similar statistical significance across the various specifications, suggesting the main findings are robust to the inclusion of the crisis period. However, given the extraordinary nature of the crisis, and our lack of understanding of its implications for debt contract design, I interpret these findings cautiously.

5. Conclusion

In this study I examine how the balance sheet approach in financial reporting has influenced the use of accounting information in debt contracts. Analyzing a large sample of private debt agreements, I find that the use of balance sheet covenants (such as net worth) has decreased over time, while inclusion of income statement covenants (such as interest coverage) has remained constant. I examine how the balance sheet approach, with its increase in fair value and estimated asset and liability values, has contributed to the decline in use of balance sheet covenants. Using the Volatility Ratio (VR), a proxy for exposure to balance sheet-based accounting rules, I find a negative association between the balance sheet approach and use of balance sheet covenants.

Although the empirical evidence shows a significant association between the VR and covenant inclusion, several important caveats apply in interpreting the results. First, while the VR appears to capture the cross-sectional variation in the effects of the balance sheet approach, it is likely measured with error. Specifically, it is difficult to separate balance sheet adjustments from non-adjustment items using Compustat data. Second, there are a variety of reasons other than accounting standards that could lead to changes in covenant use. I have tried to control for these alternative explanations in the empirical tests. However, to the extent that the alternatives are difficult to measure empirically (e.g. scarce data on which loans are sold in the secondary market or securitized), there may be additional factors driving the change in covenant use. On this basis, I conclude that the long-term shift in standard setting related to the balance sheet approach has contributed to, but is not the sole reason for, the change in use of balance sheet covenants.

Appendix A. Definitions of earnings and net worth from covenants

Central to the contention that changing accounting standards are affecting balance sheet covenants disproportionately to income statement covenants is the issue of modification: while it is relatively straightforward to write non-contracting useful items out of income statement numbers, it is less clear how to do so for balance sheet numbers. The Dealscan database provides a general definition of the covenants used in each deal, but lacks sufficient information to determine the precise measure. For example, the database will indicate when an interest coverage covenant is used, but does not say how earnings are measured (e.g. Net Income versus EBITDA) or any departures from GAAP in that measure (e.g. exclusion of certain items such as write-ups or write-downs of assets). Given the importance of measurement, I examine a subsample of deals with publicly available loan contract data (disclosed in sources such as 8-k and 10-k filings with the SEC).²⁷ This allows me to measure the exact definitions used in the contracts, and determine if a) income statement measures are modified to exclude balance sheet adjustments, and b) balance sheet measures are less frequently modified.

I randomly select 100 deals from my sample and collect covenant data. Data on this sample is summarized in Table A1. Of these deals, 96 have income statement-based covenants and 68 have balance sheet-based covenants. These percentages are consistent with Nini et al. (2009).

²⁷ This data is available on Amir Sufi's website: <http://faculty.chicagobooth.edu/amir.sufi/>.

Table A1
Adjustments to income statement and balance sheet covenants.

Income statement	96	Balance sheet	68
<i>Modification</i>		<i>Modification</i>	
Extraordinary G/L	49	Intangible assets	26
Non-cash	45	Write-up/down	8
Non-recurring	13	Foreign exchange	4
Write-up/down	15	Other comp. income	4
Goodwill	7		
Defined as GAAP	6	Defined as GAAP	44

Notes: This table presents the descriptive data on the modification of financial covenants. The data is from 100 randomly drawn observations from the sample. INCOME STATEMENT covenants include interest coverage, fixed charge coverage, and debt-to-earnings. BALANCE SHEET covenants include net worth, leverage, and current ratio. Data is collected from SEC filings.

The measurement of earnings in covenants features considerable modification. The most common is the exclusion of extraordinary gains and losses, in over 50% of deals with income statement covenants. The next four modifications relate directly to balance sheet adjustments. Nearly 50% of the deals remove “non-cash adjustments”, which likely include adjustments due to impairments and other balance sheet adjustments. Fifteen and seven deals refer specifically to revaluation of assets and goodwill adjustments, respectively. These modifications appear designed to unravel the effects of balance sheet adjustments.

In contrast, there is relatively little modification to the GAAP definition of net worth. The most commonly written-out item, consistent with Frankel et al. (2008) is intangible assets, which is subtracted in 38% of the deals. Beyond this there are relatively few modifications. Asset revaluations are excluded in 12% of deals with balance sheet covenants. Four deals have net worth that excludes other comprehensive income, which contains some balance sheet adjustments.

In some cases, earnings and net worth are defined strictly based on GAAP. A total of six deals have earnings as defined by GAAP. In contrast, net worth is defined based on GAAP (as assets minus liabilities or shareholders' equity, with no further modification other than the exclusion of intangible assets, also defined under GAAP) in 44 of the 68 cases. Collectively, this evidence is consistent with expectations regarding covenant measurement. The effects of balance sheet adjustments are frequently written out of earnings in covenants. However, modifications to GAAP-measured net worth are relatively rare.

Appendix B. Decomposition and analysis of volatility ratio

Volatility Ratio (VR), the measure of balance sheet focus used in this study, is the ratio of (a) the volatility of changes in book value to (b) the volatility of adjusted net income. In this Appendix, I provide a decomposition of VR showing which Compustat data items include adjustments. I also present evidence on measurement error in VR, including descriptive statistics on the components of balance sheet adjustments and their association with VR.

B.1. Decomposition of book value

I start with Retained Earnings, which includes three components²⁸:

$$REQ = REUNAQ + ACOMINCQ + SEQQQ \quad (B1)$$

REUNAQ is unadjusted retained earnings, ACOMINCQ is accumulated other comprehensive income, and SEQQQ is other shareholders' equity. REUNAQ is cumulative net income less cumulative dividends. Expanding unadjusted retained earnings and moving cumulative dividends to the left-hand side yields:

$$REQ + \sum DIV = \sum NIQ + ACOMINCQ + SEQQQ \quad (B2)$$

NIQ is net income, while DIV is calculated as $(DVPSPQ \times CSHOQ)$. Both ACOMINCQ and SEQQQ include balance sheet adjustments. In addition, some components of net income are also adjustments, specifically special items (SPIQ) and non-operating income and expense (NOPIQ). I rewrite equation (B2) separating these items from net income:

$$REQ + \sum DIV = \sum (NIQ - SPIQ - NOPIQ) + \sum (SPIQ + NOPIQ) + ACOMINCQ + SEQQQ \quad (B3)$$

Taking Eq. (B3) in changes yields

$$\Delta REQ + DIV = [NIQ - SPIQ - NOPIQ] + [(SPIQ + NOPIQ) + (\Delta ACOMINCQ + \Delta SEQQQ)] \quad (B4)$$

This equation links to Eq. (5) from the text. The left-hand expression captures the change in book value assuming no capital transactions or dividends. The first bracketed portion of the right-hand part of the equation (net income minus special items and non-operating income and expense) is adjusted net income. The second bracketed portion of the right-

²⁸ All variables' mnemonics are from the Xpressfeed quarterly file.

Table B1
Components of balance sheet adjustments.

Year	Special items	Non-operating income and expense	Estimated dirty surplus
1996	0.038	0.016	0.005
1997	0.050	0.021	0.002
1998	0.060	0.020	0.012
1999	0.068	0.032	0.010
2000	0.109	0.029	0.013
2001	0.115	0.031	0.009
2002	0.149	0.038	0.005
2003	0.170	0.037	0.003
2004	0.152	0.038	0.010
2005	0.118	0.042	0.019
2006	0.101	0.044	0.034
2007	0.099	0.042	0.011

Notes: This table presents data on the components of balance sheet adjustments over the sample period. The table reports mean absolute values for all sample firms with data available from Compustat. SPECIAL ITEMS is the ratio of special items (SPI) to total assets (AT). NON-OPERATING INCOME AND EXPENSE is the ratio of non-operating income and expense (NOPI) to total assets. ESTIMATED DIRTY SURPLUS is the change in retained earnings (RE) plus dividends (DVSPSP \times CSHO) minus net income (NI) scaled by total assets.

hand part of the equation includes other income (special items and non-operating income and expense) and dirty surplus (change in accumulated other comprehensive income and other shareholders' equity).

B.2. Components of adjustments

As described in Section 3.2, the Volatility Ratio (VR) has the entire change in book value in the numerator and the adjusted net income in the denominator. Following the decomposition of book value, this formulation implicitly assumes that all special items, non-operating income and expense, accumulated other comprehensive income, and other shareholders' equity transactions are balance sheet adjustments. In reality, each of these data items includes both adjustment and non-adjustment items; it is only due to limitations in the Compustat data that I make the above assumption. In the remainder of this Appendix, I assess the extent of the measurement error induced by this assumption. This evidence shows that VR is more closely associated with balance sheet adjustments (fair value adjustments and other balance sheet adjustments) than non-adjustment items, providing support for VR as a proxy for balance sheet focus in financial statements.

I measure adjustments as four different Compustat accounts: special items (SPIQ), non-operating income and expense (NOPIQ), change in accumulated other comprehensive income (Δ ACOMINCQ), and change in other shareholders' equity (Δ SEQOQ). In Table B1 I present the annual mean absolute values of these accounts, to provide a sense of the magnitude of adjustments over time. While special items and non-operating income and expense are available from Compustat for the entire sample period, accumulated other comprehensive income and other shareholders' equity are only reported as separate data items starting in 2001; prior to this, they are reported as part of retained earnings (REQ). As such, I estimate the dirty surplus as the difference between the change in book value and net income. This table shows that the largest component of adjustments is special items, followed by non-operating income and expense. Estimated dirty surplus is a relatively small component of adjustments.

An important limitation of using Compustat data is that adjustments and non-adjustment items are often grouped together into single data items. In this section, I provide analysis on the amount of adjustments included in three data items: special items, non-operating income and expense, and accumulated other comprehensive income.²⁹ Compustat provides some data on the components of special items and accumulated other comprehensive income (with data available starting in 2001 for a subsample of firms); using this data and hand-searches of SEC filings, I estimate the annual level of adjustments.

Special items has nine component data items in Compustat. Four are balance sheet adjustments: goodwill impairment write-offs (GDWLIA), restructuring charges (RCA), fixed asset impairment write-offs (WDA), and in-process R&D (RDIPA). Following the terminology in Section 2.2, I classify these as Other Balance Sheet Adjustments. I classify the five others—acquisitions (AQA), gain/loss on asset sales (GLA), litigation settlements (SETA), extinguishment of debt (DTEA), and other special items (SPIOA)—as Non-Adjustment Items. I present annual mean absolute values in Table B2, with other balance sheet adjustments in Panel A and non-adjustment items in Panel B. Over the sample period, other balance sheet adjustments comprise approximately two-thirds of special items.

Accumulated other comprehensive income has six component data items in Compustat. Again following the terminology in Section 2.2, three are fair value adjustments: derivative gain/loss (AOCIDERGL) and unrealized gain/loss on securities (AOCISECGL and MSA). Two others are non-adjustment items: foreign currency translation adjustment (RECTA) and other

²⁹ Other shareholders' equity (SEQOQ) is on average less than 0.1% of total assets, so I exclude this from the analysis.

Table B2
Components of special items.

<i>Panel A: Other balance sheet adjustments</i>						
Year	Goodwill impairment write-offs	Restructuring charges	Fixed asset impairment write-offs	In-process R&D	Total other balance sheet adjustments	
2001	0.021	0.011	0.007	0.005	0.021	
2002	0.041	0.021	0.012	0.005	0.031	
2003	0.042	0.023	0.020	0.004	0.038	
2004	0.044	0.023	0.022	0.006	0.048	
2005	0.027	0.023	0.020	0.003	0.040	
2006	0.024	0.004	0.022	0.012	0.054	
2007	0.032	0.002	0.026	0.006	0.065	

<i>Panel B: Non-adjustment items</i>						
Year	Acquisitions	Gain/loss on asset sales	Litigation settlements	Extinguishment of debt	Other special items	Total non-adjustment items
2001	0.001	0.003	0.003	0.000	0.010	0.005
2002	0.001	0.004	0.002	0.007	0.004	0.009
2003	0.002	0.004	0.004	0.001	0.013	0.010
2004	0.002	0.007	0.003	0.001	0.013	0.014
2005	0.002	0.007	0.003	0.004	0.008	0.016
2006	0.002	0.007	0.008	0.002	0.005	0.023
2007	0.002	0.012	0.005	0.002	0.006	0.018

Notes: This table presents summary data on the components of special items over the sample period. The table reports mean absolute values for all sample firms with data available from Compustat. Panel A presents special items components classified as other balance sheet adjustments; these are adjustments featuring estimated asset or liability values, including GOODWILL IMPAIRMENT WRITE-OFFS (GDWLIA), RESTRUCTURING CHARGES (RCA), FIXED ASSET IMPAIRMENT WRITE-OFFS (WDA), and IN-PROCESS R&D (RDIPA). Panel B presents special items components classified as non-adjustment items, including ACQUISITIONS (AQA), GAIN/LOSS ON ASSET SALES (GLA), LITIGATION SETTLEMENTS (SETA), EXTINGUISHMENT OF DEBT (DTEA), and OTHER SPECIAL ITEMS (SPIOA). Each item is scaled by average total assets (AT). The right-hand column shows the absolute value of the sum of the i column items: $\text{abs}[\sum_{i=1}^N \text{Col}_i]$.

comprehensive income (AOCIOTHER). One item, pension adjustment (AOCIPEN) does not fit into a single category. This data item includes two parts, adjustment to plan assets (PROADJ, from the Compustat pension file) which includes estimated asset and liability values, and prior service cost (PRPSC) which is not an adjustment. Based on available data from Compustat, approximately two-thirds of the pension adjustment is the value adjustment portion, and the remainder is prior service cost. I therefore allocate two-thirds of pension adjustment to other balance sheet adjustments and the remaining one-third to non-adjustment items. Table B3 shows the annual mean absolute value of each data item, with fair value adjustments, other balance sheet adjustments, and non-adjustment items in Panels A, B, and C respectively.

Like special items and accumulated other comprehensive income, non-operating income and expense includes both adjustments and non-adjustment items. However, Compustat provides no component break-out for this data item. In order to properly allocate this account to the three different categories, I randomly select 50 observations from the sample and examine the note on non-operating income and expense in the 10-k. I find that two fair value adjustments, unrealized gain/loss on investment securities (classified as trading) and unrealized gain/loss on certain derivatives are commonly included in this account. For the randomly selected firms, they average 70% of NOPIQ, though the proportion ranged from 0%–100%. The portion of NOPIQ that is not fair value adjustments includes a variety of non-adjustment items. On this basis, I conservatively allocate 50% of non-operating income and expense to fair value adjustments, and the remainder to non-adjustment items.

Table B3
Components of accumulated other comprehensive income.

<i>Panel A: Fair value adjustments</i>			
Year	Derivative gain/loss	Unrealized gain/loss on securities	Total fair value adjustments
2001	0.000	0.005	0.004
2002	0.001	0.004	0.003
2003	0.002	0.004	0.004
2004	0.003	0.006	0.005
2005	0.004	0.006	0.009
2006	0.003	0.004	0.006
2007	0.004	0.004	0.007

Table B3 (continued)

Panel B: Other balance sheet adjustments				
Year	Pension adjustment ^a			Total other balance sheet adjustments
2001	0.007			0.007
2002	0.009			0.009
2003	0.013			0.013
2004	0.017			0.017
2005	0.021			0.021
2006	0.028			0.028
2007	0.032			0.032
Panel C: Non-adjustment items				
Year	Foreign currency translation adjustment	Pension adjustment ^b	Other comprehensive income	Total Non-adjustment items
2001	0.036	0.004	0.000	0.033
2002	0.038	0.005	0.000	0.034
2003	0.039	0.007	0.001	0.035
2004	0.029	0.009	0.000	0.027
2005	0.027	0.011	0.000	0.027
2006	0.017	0.015	0.000	0.028
2007	0.013	0.017	0.001	0.026

Notes: This table presents summary data on the components of accumulated other comprehensive income (OCI) over the sample period. The table reports mean absolute values for all sample firms with data available from Compustat. Panel A presents OCI components classified as fair value adjustments; these are adjustments whose values are driven by observed or estimated market prices, including DERIVATIVE GAIN/LOSS (AOCIDERGL), and UNREALIZED GAIN/LOSS ON SECURITIES (AOCISECGL+MSA). Panel B presents OCI components classified as other balance sheet adjustments; these are adjustments featuring estimated asset or liability values, including two-thirds of the value of the PENSION ADJUSTMENT (AOCIPEN). Panel C presents special items components classified as non-adjustment items, including FOREIGN CURRENCY TRANSLATION ADJUSTMENT (RECTA), one-third of the PENSION ADJUSTMENT (AOCIPEN), and OTHER COMPREHENSIVE INCOME (AOCIOTHER). Each item is scaled by average total assets (AT). The right-hand column shows the absolute value of the sum of the i column items: $\text{abs}[\sum_{i=1}^N \text{Col}_i]$.

^a Two-thirds of the reported pension adjustment is classified as an Other Balance Sheet Adjustment.

^b One-third of the reported pension adjustment is classified as a Non-Adjustment Item.

In Table B4 I measure the annual levels of fair value adjustments, other balance sheet adjustments, and non-adjustment items for all sample firms. Where data is not available (i.e. not reported on Compustat) I estimate the level based on historical data, using the level of total special items and accumulated other comprehensive income (or its estimated value). I also include volatility ratio and adjusted net income in the table.

Table B4

Association between VR and components of balance sheet adjustments.

Year	Volatility ratio	Fair value adjustments	Other balance sheet adjustments	Non-adjustment items	Adjusted net income
1996	1.952	0.013	0.058	0.021	0.086
1997	1.514	0.014	0.071	0.023	0.103
1998	1.450	0.014	0.075	0.027	0.104
1999	1.606	0.023	0.075	0.031	0.130
2000	1.459	0.022	0.120	0.093	0.153
2001	1.912	0.026	0.117	0.057	0.134
2002	1.772	0.029	0.161	0.072	0.086
2003	1.783	0.030	0.168	0.077	0.148
2004	2.170	0.032	0.161	0.075	0.195
2005	2.264	0.036	0.126	0.080	0.212
2006	2.702	0.032	0.179	0.087	0.253
2007	2.143	0.034	0.188	0.090	0.286
Correlation with VR		0.296	0.327	0.191	0.012

Notes: This table presents summary data on three components of balance sheet adjustments, the volatility ratio, and adjusted net income. If Compustat data is not available, I estimate the value using historical data. VOLATILITY RATIO is the ratio of the five-year standard deviation of the change in book value ($\Delta \text{REQ} + (\text{DVPS} \times \text{CSHOQ})$) to the five-year standard deviation of ADJUSTED NET INCOME ($\text{NIQ} - \text{SPIQ} - \text{NOPIQ}$). FAIR VALUE ADJUSTMENTS are value changes related to actual or estimated market prices, and include unrealized gains and losses on securities and derivatives. OTHER BALANCE SHEET ADJUSTMENTS are estimated value changes of various assets and liabilities, and include fixed asset write-offs, goodwill impairment write-offs, in-process R&D, and restructuring charges. NON-ADJUSTMENT ITEMS are items that are neither fair value nor other balance sheet adjustments, but are included in the calculation of adjustments. The bottom row of the table shows the univariate correlation of the volatility ratio with the three components of balance sheet adjustments and the adjusted net income.

Fair value adjustments, other balance sheet adjustments, and non-adjustment items are all increasing over the sample period, similar to Volatility Ratio (VR). To examine how effectively VR is capturing the effects of the balance sheet approach, I measure the cross-sectional correlation between VR and each of the three categories

$$\text{corr}\left(\frac{\text{var}(\Delta BV)}{\text{var}(\text{ANI})}, \text{abs}(\text{Adj_Comp}/\text{TA})\right) \quad (\text{B5})$$

The left-hand term is the Volatility Ratio, and the right-hand term is the absolute value of each of the components of measured adjustments (Adj_Comp) scaled by total assets. As shown in the bottom row of Table B4, VR has the strongest correlation with Other Balance Sheet Adjustments (0.327) followed by Fair Value Adjustments (0.296). While there is still a statistically significant correlation between VR and Non-Adjustment Items (0.191), this relation is the weakest of the three. These statistics show that VR is more strongly associated with the two categories of balance sheet adjustments than with non-adjustment items. Hence, assuming the scaled absolute value captures the extent of fair value, other adjustments, and non-adjustment items (given these also feature estimates and may be measured with error), these correlations provide evidence that VR is a good proxy for the level of balance sheet adjustments in a firm's reporting.

Appendix C. Variable definitions

See Table C1.

Table C1

Variable name	Definition	Source
Measuring balance sheet focus		
Change in book value	$\Delta \text{REQ} + (\text{DVPSPOQ} \times \text{CSHOQ})$	Compustat
Book value volatility	Standard deviation of change in book value: 5-year window	Compustat
Adjusted net income	$\text{NIQ} - \text{SPIQ} - \text{NOPIQ}$	Compustat
Adjusted net income volatility	Standard deviation of Adjusted Net Income: 5-year window	Compustat
Volatility ratio	Book value volatility/adjusted net income volatility	Compustat
Covenant classes and types		
Income statement covenants include:	Interest coverage, fixed charge coverage, debt-to-earnings	Dealscan
Balance sheet covenants include:	Leverage, Net Worth, Current Ratio	Dealscan
IS covenant	Indicator variable with a value of one for deals with an income statement covenant	Dealscan
BS covenant	Indicator variable with a value of one for deals with a balance sheet covenant	Dealscan
IS only	Indicator variable with a value of one for deals with only income statement covenants	Dealscan
BS only	Indicator variable with a value of one for deals with only balance sheet covenants	Dealscan
Both	Indicator variable with a value of one for deals with both income statement and balance sheet covenants	Dealscan
Neither	Indicator variable with a value of one for deals with neither income statement nor balance sheet covenants	Dealscan
IS covenant in prior deal	Indicator variable with a value of one if the borrower's prior deal had an income statement covenant	Dealscan
BS covenant in prior deal	Indicator variable with a value of one if the borrower's prior deal had a balance sheet covenant	Dealscan
IS only in prior deal	Indicator variable with a value of one if the borrower's prior deal had only income statement covenants	Dealscan
BS only in prior deal	Indicator variable with a value of one if the borrower's prior deal had only balance sheet covenants	Dealscan
Both in prior deal	Indicator variable with a value of one if the borrower's prior deal had both income statement and balance sheet covenants	Dealscan
Covenant changes		
Old covenant	For firms with more than one loan during the sample period, the covenant type of the initial (pre-change) loan	Dealscan
New covenant	For firms with more than one loan during the sample period, the covenant type of the second (post-change) loan	Dealscan
Increasing	An indicator with a value of one if the New Covenant type includes a covenant the Old Covenant does not	Dealscan
Maintaining	Indicator with a value of one if the New Covenant and Old Covenant are of the same type	Dealscan
Decreasing	Indicator with a value of one if the Old Covenant type includes a covenant the New Covenant type does not	Dealscan
Aggregate change-IS	Indicator with a value of one for Increasing, zero for Maintaining, and negative one for Decreasing for income statement covenant changes	Dealscan
Aggregate change-BS	Indicator with a value of one for Increasing, zero for Maintaining, and negative one for Decreasing for balance sheet covenant changes	Dealscan

Table C1 (continued)

Variable name	Definition	Source
Control/other variables		
Asset tangibility	PPENTQ/ATQ	Compustat
Leases	$\sum_{i=1}^5 \text{MRC}_i / (1.1)^i$, where MRC_1 – MRC_5 are rental payments for years 1 through 5	Compustat
Institutional tranche indicator	Indicator with a value of one if the deal includes a term loan of tranche B or higher	Dealscan
EBITDA	OIBDPQ/avg(ATQ)	Compustat
Leverage	(DLTTQ+DLCQ)/ATQ	Compustat
Market-to-book	(ATQ–CEQQ+(CSHOQ×PRCCQ))/ATQ	Compustat
EDF	Estimated probability of default based on the Merton (1974) model as measured by Hillegeist et al. (2004)	Compustat, CRSP
Size	$\ln(\text{CSHOQ} \times \text{PRCCQ})$	Compustat
Syndicate size	Natural logarithm of the number of syndicate members	Dealscan
Capex restriction	Indicator with a value of one if capital expenditures are restricted in the loan contract	Dealscan
Performance pricing	Indicator with a value of one if the loan contract includes a performance pricing provision	Dealscan
Collateral	Indicator with a value of one if the loan contract requires collateral	Dealscan

Notes: All Compustat variables are from the Xpressfeed quarterly data. All income statement variables are annualized by summing the current and prior three quarterly observations. Compustat variables are winsorized at the top and bottom 1% of observations.

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