

Corporate leverage ratio adjustment under cash flow-based debt covenants

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Summary

Debt covenants attempt to solve the agency problem between shareholders and bondholders. Recent research suggests that the presence of covenants slows down firms in their adjustment towards its target capital structure. However, in the absence of an appropriate measure of covenant slack, these findings are based on simple covenant counts or the probability of violation one period ahead. We argue that both methods fall short. Firstly, simple counts neglect how constrained a firm is by the prescribed financial ratios and the rich nature of covenant types. Secondly, while violations can be costly, lenders frequently waive them, and thus the violation probability may not be management's most pressing concern. To overcome these shortfalls, we introduce a new measure for covenant slack. Our non-parametric method makes different covenant types comparable and relates a firm's slack to that of other firms and other time periods. Our findings challenge existing research by showing that the mere presence of covenants increases the speed of adjustment. Moreover, using our proposed new measure, we show that firms with the least slack adjust significantly faster towards their target.

Motivations

- **Speed of adjustment: Firm-specific characteristics** explain empirical findings on the speed of adjustment toward the optimal leverage ratio- (Flannery and Rangan, 2006). Speed of adjustment associated with a **firm's current levels of capital structure** (Byoun, 2008).
- **Current debt market: 80% of US private corporate borrowing is cash-flow based**, and only 20% is asset-backed (Lian & Ma, 2020).
- **Covenant violation: Costly.** Management **try to adjust** the firm's capital structure to **avoid the distress cost** that covenant may cause and prepared for future negotiations. Researchers **lack experience** in measuring the **probability of covenant violation**.
- **Covenant slack:** In the loan agreement process, **creditors and borrowers negotiate** the appropriate threshold covenant, which is the **desirable range of ratio** in managers' minds, plus an **acceptable cushion**. This acceptable cushion would then be the preferred slack for this specific financial ratio.

Results

	(1)	(2)	(3)	(4)
	Baseline SOA	Cov Dummy	Cov Index	Cov Slack
	Δ BDR	Δ BDR	Δ BDR	Δ BDR
TDE	0.146*** (62.38)	0.150*** (51.77)	0.149*** (52.52)	0.148*** (51.55)
TDE*Cov Dummy		0.014** (2.52)		
Cov Dummy		0.008*** (9.71)		
TDE*Cov Index			0.013*** (4.75)	
Cov Index			0.005*** (11.00)	
TDE*Cov Slack				0.060*** (6.92)
Cov Slack				0.018*** (13.82)
Constant	0.003*** (9.90)	0.002*** (6.21)	0.002*** (5.87)	0.002*** (4.94)
Observations	85,463	72,909	72,909	72,918
Adjusted R ²	0.068	0.072	0.072	0.073

BDR: Book Value of Debt to Total Assets ratio
TDE: is the deviation of the leverage ratio from the target ratio
Cov Dummy: equals 1 if the firm has at least one covenant active, 0 otherwise
Cov Index: captures the intensity of covenants per firm-year, defined as the total number of covenants for specific firm years, ranging from 1 to 12
Cov Slack: measures the slack of the covenant, ranging from 0 to 1. 0 means the lowest slack across the entire dataset or no covenant, a slack equal to 1 means the largest slack of all firms and all years for the specific covenant.

- In the **baseline** estimation of speed of adjustment that implies that **firms close 14.6% of the gap between current and desired leverage within one year**. At this rate, a typical firm will take 4.39 years to close half of the deviations from its target leverage ratio after a one-unit shock to the error term.
- The **presence of covenants** is positively related to the speed of adjustment; firms **with at least one covenant close 16.4% of the gap between current and desired leverage within one year**.
- **Covenant intensity** is positively related to the speed of adjustment, firms with a covenant index of one close between **16.2% of the gap between current and desired leverage within one year**, while firms with a covenant index of 3 close almost 50% of the gap within one year. The speed of adjustment increased by **8.5% (0.013/0.149) per covenant**.
- The tighter **covenant slack**, the higher is the speed of adjustment toward an optimal capital ratio, firms with **at least slack close 25% of the gap between current and desired leverage within one year**. The speed of adjustment is **41% (0.060/0.147)**, when the firm **is almost in violation**.

Conclusions

We find strong evidence that **firms speed up their adjustment towards their target leverage ratio if they are bound by covenants**. This effect is particularly pronounced if the firms have below average slack on their covenants. To measure slack, we have introduced a new measure for covenant tightness, drawing from the "wisdom of the crowd" of managers who have an appropriate slack in mind: we consider a covenant to be tight if the firm's distance to the threshold stipulated in covenant is at a low percentile of the distribution across all firms. Unlike previous literature, we consider a pure sample of firms who are either debt-free, not bound by covenants, or are in good standing with respect to their financial ratios. We posit that this allows us to get a clearer insight into the impact of covenants on adjustment speed, reducing the confounding impact of financial distress.

Data & Methodology

Data

Firm specific-characteristics: Non-financial and non-utility firms in annual CRSP/Compustat merged by fiscal year in the time frame of 1987 and 2018. We also omit firms with less than two consecutive years of data, given that our regression specifications use dynamic panel data models, which include lagged variables.

Debt Covenants: Loan Pricing Corporation (LPC) DealScan database for all loan packages that persisted in the CRSP/Compustat merged database.

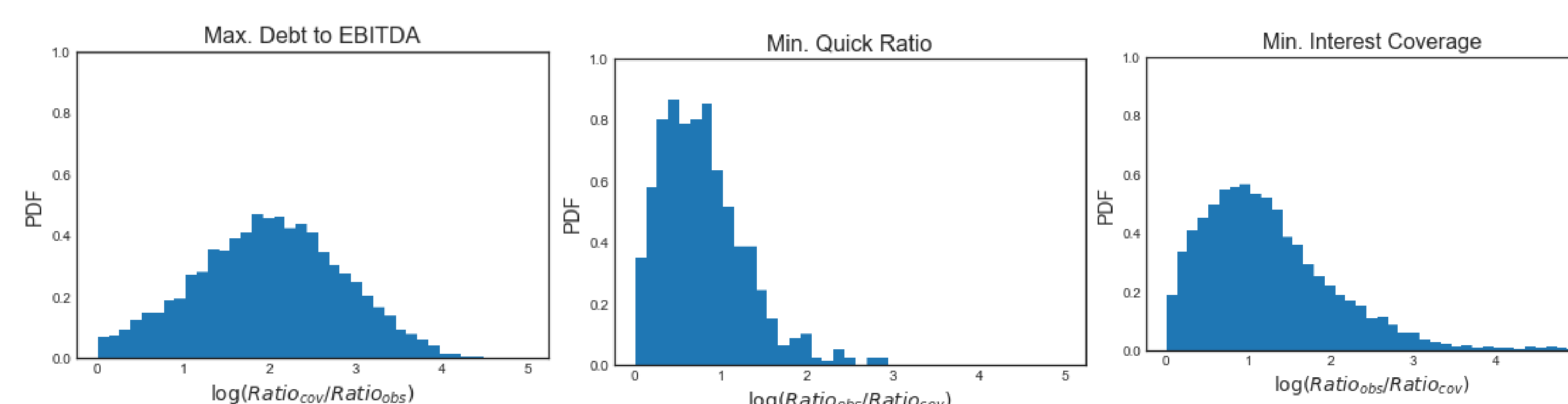
Observed covenant: Following Greenwald (2019), we keep loan packages that have one of the twelve following covenant types: Min. Interest Coverage, Min. Fixed Charge Coverage, Min. Cash Interest Coverage, Min. Debt Service Coverage, Max. Debt to EBITDA, Max. Senior Debt to EBITDA, Min. Current Ratio, Min. Quick Ratio, Max. Leverage Ratio, Max. Debt to Tangible Net Worth, Max. Debt to Equity, and Max. Senior Leverage

Numbers of firms with covenant:	Abs. Frequency	Rel. Frequency
Exactly one covenant	6,557	19.81%
Exactly two covenants	15,494	46.81%
Three or more covenants	11,051	33.38%
Total number of firms with covenant	33,102	100.00%

Methodology

Regression method: Blundell-Bond's system GMM, mitigating the issues from fixed effect regression and endogenous variables.

Slack measurement: We compute the tightness of a covenant as the log difference of the observed financial ratio and the financial ratio it prescribes; we switch the sign accordingly if the covenant requires a minimum financial ratio. Since the distributions of the slack measured as the log-difference is different for each covenant type, we introduce a non-parametric measure, the slack percentile. For each covenant type, we compute the percentile to which the slack corresponds across the entire sample. Firm-year observations of a large percentile indicate a firm that is closer to the covenant threshold than most firms in most years



References

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