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Despite the importance of renegotiation in affecting loan terms of bank debt, little work has been done investigating factors influencing renegotiation of privately placed debt. We find that renegotiation is more likely to occur in good economic times as measured by lower unemployment, lower public credit spreads, and outside of economic recessions. Moreover, renegotiated loan terms are more favorable for the borrower in business cycle upswings. Changes to debt covenants are very weakly correlated with the broader economy, suggesting that covenant amendments may be more driven by discovery of firm-specific information. Finally, we find that a healthier commercial banking sector not only significantly increases the probability of renegotiation, but also leads to more favorable terms for the borrower.

Macroeconomic Factors in Private Bank Debt Renegotiation

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Abstract

Despite the importance of renegotiation in affecting loan terms of bank debt, little work has been done investigating factors influencing renegotiation of privately placed debt. We find that renegotiation is more likely to occur in good economic times as measured by lower unemployment, lower public credit spreads, and outside of economic recessions. Moreover, renegotiated loan terms are more favorable for the borrower in business cycle upswings. Changes to debt covenants are very weakly correlated with the broader economy, suggesting that covenant amendments may be more driven by discovery of firm-specific information. Finally, we find that a healthier commercial banking sector not only significantly increases the probability of renegotiation, but also leads to more favorable terms for the borrower.

1   Introduction

Privately placed bank debt is by far the most important source of external financing for firms, with a total dollar value larger than public debt and public and private equity combined (Gorton and Winton, 2003). Past work has shown that private debt contracts are not static; they in fact undergo significant changes in contract terms through successive rounds of renegotiation. Despite the importance of both private debt and renegotiation, there is very little work examining the renegotiation of private debt outside of financial distress. In this paper, we examine the relationship between the macroeconomy and renegotiation of private bank debt.

1.1   Theoretical Work

In a theoretically economic ideal world, financial contracts agreed to by two self-interested parties are Pareto optimal given the information available at the time of contracting (Maskin and Moore, 1999). No party could benefit from a change without the expense of the other. However, unexpected shifts in states of the world can lead to an ex post surplus under the original contract terms. When this occurs, parties are incentivized to renegotiate the contract terms in order to realize a Pareto improvement. Here, contract terms can include the amount committed by the lender, the length of the contract, the interest rate spread charged to the borrower, the commitment fee charged to the borrower, and various restrictive covenants that may be placed on the operations and capital structure of the borrowing firm.

For example, when the credit quality of a borrower improves significantly from the borrower's credit quality at origination, in the presence of alternative sources of financing both parties are incentivized to renegotiate (Garleanu and Zweibel, 2007). Simply put, without renegotiation, the borrower can go to a competing lender for better contract terms. Similarly, when borrower credit quality deteriorates after origination, the agreements are often renegotiated in the presence of competing business for the lender.

The borrower's threat of leaving its current lender gives the borrower more bargaining power in the renegotiation process. Without such a credible threat, the borrower will have less bargaining power irregardless of favorable changes in their financial condition (Rajan, 1992). The credibility of such a threat can be tied to relative changes in the macroeconomy and the health of commercial banking sector, which provides some theoretical foundation for this paper.

The expectation of renegotiation plays a crucial role in ex ante contractual terms. Multiple renegotiation rounds are a consequence of restrictive initial contracts designed to protect the lender from information asymmetry at the time of contracting (Dichev and Skinner, 2002). At origination, borrowers accept more restrictive terms with the expectation that these tight constraints will be related in ex post renegotiation (Hart and Moore, 1998). The possibility of renegotiation slows the revelation of information, a result that has been empirically supported (Roberts, 2010).

1.2   Empirical Work

Much of the literature completed to date on renegotiation of financial contracts has focused on financial distress situations. Half of firms that undergo severe financial distress renegotiate with the lenders to restructure their debt outside of formal bankruptcy, particularly those that owe more debt to banks, owe fewer lenders, and have more intangible assets (Gilson et al., 1990). Firms that restructure in formal Chapter 11 bankruptcy have larger reductions in debt than firms that restructure outside of Chapter 11, suggesting that transaction costs discourage debt reductions by financially distressed firms restructuring outside of official proceedings (Gilson, 1997).

In the past few years, there has been limited work on renegotiation of bank debt for all firms. Renegotiation affects almost all credit agreements, with over 90% of long-term debt contracts renegotiated prior to their original stated maturity (Roberts and Sufi, 2009). Bank loans are repeatedly renegotiated by the borrower, with the typical loan undergoing renegotiation every eight months for four times during the

life of the contract (Roberts, 2010). Consistent with the theory on informational asymmetry, the number of renegotiation rounds a loan undergoes is closely tied to the restrictiveness of the initial contract, and more anticipated renegotiation rounds are positively correlated with the time between those rounds (Roberts, 2010).

In addition, there is some evidence that loans originated in good economic times, specifically periods of higher equity returns and low interest rate environments, experience fewer renegotiations (Roberts, 2010). This paper aims to explore the effect of the macroeconomic context on renegotiation activity in credit agreements further.

2 Data

We use the novel data set developed by Roberts (2010). The data set starts with linked information from the Standard and Poor's Compustat database and Thomson Reuter's Dealscan database for a random sample of 103 firms. Accounting information is drawn from Compustat and relevant loan information is drawn from Dealscan. We limit our sample to privately placed debt.

Next, we manually identify the originations and renegotiations for each these firms by examining the required SEC filings on EDGAR, generally in Forms 10-K, 10-K405, 10-Q, S-8, and 8-K. Firms are required to disclose material debt agreements and sources of liquidity, so generally the full text of credit agreements is publicly available. Filings are available from 1994 to 2010, but we are able to extend our sample to pre-1994 periods when the relevant credit agreements are referenced.

The Dealscan database does not differentiate between originations and renegotiations; we find that almost half of the loan observations in Dealscan are in fact renegotiations. In addition, we find the Dealscan database in many cases fails to record all loan tranches in a given credit agreement. This is a significant observation because almost all of the existing empirical work employing the Dealscan database has assumed that each loan observation corresponds to an origination.

2.1 Loan Paths

This labor-intensive collection process enables us to construct loan paths. For a detailed discussion on the construction of loan paths, see Roberts (2010). Simply put, a loan path follows the evolution of a single tranche of a credit agreement from origination to maturity or termination, with renegotiations occurring as intermediate events. We consider Amendments to Credit Agreements and Amended and Restated Credit Agreements (ARCAs) as renegotiations in loan paths. Credit agreements that are "refinanced" or replaced by entirely new credit agreements are considered an origination and not a renegotiation.

Table 1 shows a sample loan path for Penn National Gaming (PENN). The original credit agreement in November 1996 provided for a $5m revolving credit facility with a maturity of 5 years. The interest rate charged on the outstanding amount is specified as a spread over LIBOR and varies from 1.5% to 3% depending on the credit quality of the borrower. The lenders charge a commitment fee on the untapped portion of the facility that varies between 0.375% and 0.5%, again depending on the credit quality of the borrower. We see that renegotiations results in large changes to the loan terms. The first renegotiation doubles the facility amount, which is increased to $20m by the end of the life of the loan. The contract maturity is extended once in December 1997, and contract terms are relaxed in the last four amendments, with amendments lowering the interest rate and loosening financing and investment covenants.

Each event in this loan path corresponds to an observation in our data set. We insert blank observations for each month in which a renegotiation did not occur. Thus, our final dataset contains unique tranche-month observations. In the rare occurrence that multiple renegotiations occur in the same month, we treat them as occurring in two or more adjacent months. Macroeconomic and banking industry data is obtained from Global Financial Data, the Center for Research in Security Prices (CRSP), the Federal Reserve Bank of St. Louis FRED database, and the Federal Deposit Insurance Corporation (FDIC).

Table 1: Sample Loan Path (PENN)

	Event Type	Facility Amount	Event Date	Maturity	Facility End Date	Min LIBOR	Max LIBOR	Min Commit Fee	Max Commit Fee	
1	Origination	5000000	11/27/1996	60	11/26/2001	0.015	0.03	0.00375	0.005	
2	Renegotiation	*10000000*	10/30/1997		11/26/2001	0.015	0.03	0.00375	0.005	*Increase revolver by $5m*
3	Renegotiation	*12000000*	12/17/1997	60	*12/15/2002*	0.015	0.03	0.00375	0.005	*Increase revolver by $2m, extends maturity*
4	Renegotiation	*20000000*	1/28/1999		12/15/2002	0.015	*0.0275*	0.00375	0.005	*Increase revolver by $8m, adjusts interest rate*
5	Renegotiation	20000000	7/22/1999		12/15/2002	0.015	0.0275	0.00375	0.005	*Adds new subsidiary, looses restrictions on credit*
6	Renegotiation	20000000	7/29/1999		12/15/2002	0.015	0.0275	0.00375	0.005	*Permits financing to JV with Commerce Bank*
7	Renegotiation	20000000	12/13/1999		12/15/2002	0.015	0.0275	0.00375	0.005	*Permits borrowing for $195M Hollywood Park acquisition*

We linearly interpolate quarterly macroeconomic data to obtain monthly values and assume the FDIC banking statistics hold a constant value for all months within a year.

3   Results

3.1   Annual Variation in Origination and Renegotiation Activity

Figure 1 shows the count of originations and renegotiations for credit agreements per year from 1994 to 2009 in our sample. We see that both renegotiation and origination frequency are not constant throughout time. There seems to be a peak for both renegotiations and originations around 2003. We also see that there are up to four times as many renegotiations in a given year as originations, again highlighting the importance of renegotiation in the financial contracting.

In addition, we observe renegotiation activity declined between 2005 and 2006 after a transitory spike in originations in 2005. This could be attributed to the surge of covenant-lite loans in this time period with less restrictive loan terms, where the borrower has less of an incentive to renegotiate.

3.2   Renegotiation Probability

Table 2 shows the results of an estimation of a probit on a 0/1 indicator for a renegotiation for any active loan tranche in any given month, where a 1 represents the occurrence of a renegotiation, and 0 represents otherwise. Each column represents a separate probit model estimation. This procedure is identical to the model used in Roberts and Sufi (2009), where the probability of renegotiation is represented as

$$Pr(\text{Renegotiate}_t) = \Phi(X_{t-1}\beta)$$

where Φ is the standard normal cumulative distribution function, X is a vector of covariates, and β is the unknown parameter vector estimated by maximum likelihood. Covariates representing various macroeconomic indicators are lagged one month and listed in the left column. Where applicable, we consider both the level of each covariate and its δ from the previous event, which represents the change in that variable from the last event (origination or renegotiation). We take the Baa-AAA spread on US corporate bonds to represent the expensiveness of public debt financing. The CRSP value-weighted equity return represents the attractiveness of public equity financing. We take a recession indicator and the US unemployment rate to represent the general health of the macroeconomy. The ratio of total loan losses to total net income, winsorized to control for the extreme outliers caused by the 2008 financial crisis, represents overall commercial bank health. The ratio of total liabilities to total assets of US banks represents overall commercial bank leverage.

Figure 1: Originations and Renegotiations by Year
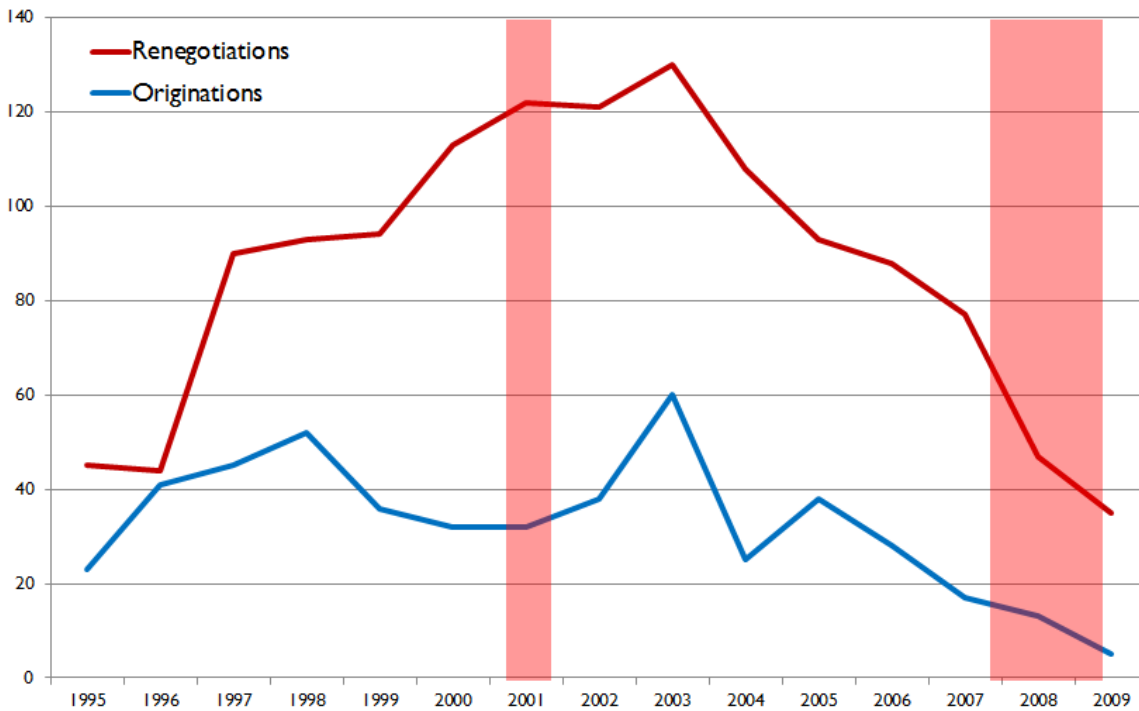
The numbers given are the marginal effects at the mean of the y-variable (renegotiation indicator) and the numbers in parenthesis are the cluster-adjusted z-statistics. One and two asterisks represent significance at the 5% and 1% level, respectively.

When public credit is expensive, renegotiation occurs less frequently, though when public credit is becoming increasingly expensive, renegotiation occurs more frequently. In particular, we see that a 1 percentage point increase in the Baa-AAA credit spread results in a 1.882% less likelihood of renegotiation. Thus, renegotiation occurs more frequently in anticipation of more expensive future credit but slows down when public credit becomes very expensive.

Renegotiation is less likely to occur in poor economics times, measured by a 0/1 recession indicator and the US unemployment rate. Renegotiation is 1.2% less likely in a recession, and the probability of renegotiation falls 0.526% for every 1% increase in the unemployment rate.

We observe in the table that the commercial bank health is a strong determinant of renegotiation probability. Higher loan losses decrease the probability of renegotiation, although when loan losses are increasing renegotiation probability increases. Thus, in expectation of future bank loan losses borrowers will tend to renegotiate, while when banks are experiencing extreme losses the probability of renegotiation falls. This is consistent with the theory that a credible threat of a borrower moving to a competing lender is needed for the borrower to have bargaining power in renegotiation, since in poor economic times it is less likely that a lender can offer better loan terms.

When banks are highly levered, renegotiation is more likely, while when banks are ramping up leverage renegotiation becomes less likely. This can be explained by the pro-cyclical nature of commercial bank leverage, where we find in good economic times banks have tended to lever more, while leverage is increasing the fastest when the economy is emerging out of an economic trough.

3.3 Analysis of Contract Terms at Renegotiation

Next, we examine various contract terms at renegotiation in Table 3. The four terms we examine are:

Table 2: Probability of Renegotiation (Marginal Effects)

	1	2	3	4	5	6
Macroeconomic Variables						
Baa-AAA spread	-0.01882					-0.02172
	(-2.81)**					(-3.27)**
Δ Baa-AAA spread	0.024835					0.02608
	(1.53)					(1.37)
Value Weighted Equity Return		0.000543				-0.00018
		(1.51)				(-0.5)
Recession Indicator			-0.01238			-0.0044
			(-2.24)*			(-0.58)
Unemployment Rate				-0.00536		0.005868
				(-2.72)**		(2.36)*
Δ Unemployment Rate				-0.00683		0.002804
				(-0.55)		(0.24)
Commercial Bank Health						
Loan Losses / Net Income winsorized					-0.05906	-0.03409
					(-3.00)**	(-1.44)
Δ Loan Losses / Net Income winsorized					0.180481	0.174068
					(5.41)**	(5.36)**
Total Liabilities / Total Assets (Leverage)					1.69606	1.542136
					(4.98)**	(4.67)**
Δ Total Liabilities / Total Assets (Leverage)					-8.84038	-9.46525
					(-13.98)**	(-12.14)**

1. Maturity - Length in months until maturity of the contract

2. Facility Amount - Amount committed in millions for the revolver or term loan

3. Interest Rate - The minimum spread over LIBOR charged to the borrower on the outstanding balance of the loan

4. Commitment Fee - The minimum commitment fee charged to the borrower on the unused portion of a revolving credit facility

For each of these variables, we consider both the level at renegotiation and the difference due to renegotiation, which is the change in the contract term since the previous event (origination or renegotiation).

We employ a simple multiple regression to predict these contract terms with the macroeconomic covariates. Again, each column represents a separate linear regression. The estimated coefficients and cluster-adjusted t-statistics are displayed. * and ** represent significance at the 5% and 1% level, respectively.

Renegotiations in good economic times appear to give more favorable terms to the borrower. For example, the difference in contract maturity due to renegotiation falls with increases in the Baa-AAA credit spread and increases in the difference in bank leverage from the previous event. Maturities tend to be shorter with higher unemployment as well.

Facility amounts tend to be higher in good economics times as well, with a 1% increase in the unemployment rate corresponding to a decrease of $98.96m in the average facility amount, controlling for the

Table 3: Analysis of Contract Terms at Renegotiation

	Level at renegotiation				Difference due to renegotiation			
	Maturity	Facility Amount	Interest Rate	Commit Fee	Maturity	Facility Amount (% diff)	Interest Rate	Commit Fee
Macroeconomic Variables								
Baa-AAA spread	0.072528	79.75112	-0.04465	-0.01036	-0.02947	0.036935	0.000412	-2.1E-05
	(0.19)	(1.18)	(-0.4)	(-0.51)	(-4.2)**	(0.26)	(0.71)	(-0.2)
Δ Baa-AAA spread	1.494296	-607.923	-0.29772	-0.00444	0.014755	0.157545	-0.00071	-7.2E-05
	(1.45)	(-1.66)	(-0.83)	(-0.06)	(1.66)	(1.02)	(-0.33)	(-0.61)
Value Weighted Equity Return	-0.01453	8.375374	-0.011	0.000884	0.000165	0.007707	2.08E-05	4.49E-06
	(-0.8)	(1.51)	(-1.77)	(0.45)	(0.54)	(1.06)	(0.97)	(0.78)
Recession Indicator	-0.24925	11.93652	0.01298	0.034216	0.003282	0.061618	0.00032	7.56E-05
	(-0.82)	(0.15)	(0.09)	(1.33)	(0.69)	(0.89)	(0.75)	(1.00)
Unemployment Rate	-0.38104	-98.9619	0.112888	0.008492	0.00344	-0.01181	0.000294	4.72E-05
	(-2.23)*	(-2.57)*	(1.77)	(0.83)	(2.01)*	(-0.51)	(1.74)	(0.69)
Δ Unemployment Rate	0.757661	424.9427	-0.07699	-0.08852	0.000202	-0.14707	0.002389	-0.00017
	(1.4)	(2.34)*	(-0.32)	(-1.06)	(0.02)	(-0.95)	(2.57)*	(-0.48)
Commercial Bank Health								
Loan Losses / Net Income winsorized	-0.70881	510.3054	0.229493	0.060481	-0.01426	-0.31668	0.00123	0.000902
	(-0.47)	(1.41)	(0.46)	(0.65)	(-1.09)	(-1.41)	(1.41)	(1.54)
Δ Loan Losses / Net Income winsorized	1.532792	-320.399	-0.79041	-0.27404	-0.17252	0.263254	0.000966	-0.0009
	(1.22)	(-1.63)	(-2.18)*	(-2.27)*	(-1.53)	(1.05)	(0.73)	(-1.58)
Total Liabilities / Total Assets (Leverage)	-0.31315	-77.9739	-0.00553	-0.00821	-0.00248	0.087699	0.000388	9.65E-05
	(-1.58)	(-3.43)**	(-0.05)	(-0.4)	(-1.11)	(2.41)*	(3.03)**	(1.56)
Δ Total Liabilities / Total Assets (Leverage)	-44.9862	5319.901	-10.3461	-2.22449	-12.6661	-22.562	-0.0323	0.005846
	(-1.38)	(1.29)	(-1.07)	(-1.05)	(-5.23)**	(-1.42)	(-0.64)	(1.04)

other variables. Not surprisingly, when banks are highly levered renegotiation tends to increase average facility amount increases slightly.

As the unemployment rate rises faster, renegotiation increases the interest rate charged on the loan. Banks may be charging more in expectation of future hardship. In addition, when banks are highly levered, renegotiation generally results in an increase in the interest rate. This supports the view that a healthy banking sector leads to more favorable terms for the borrower.

The results of the regressions on the commitment fee are statistically weak, likely because changes to the commitment fee are uncommon and do not vary much with macroeconomic cycles.

3.4 Covenant Changes in Renegotiation

In this last part, we conduct a simple analysis of covenant changes due to renegotiation. Debt covenants can be complex and vary tremendously depending on the firm. For purposes of this study, we classify covenant changes into four types:

1. Financing - Restrictions on the firm's capital structure, including interest coverage ratio (EBITDA / Interest Expense), firm leverage, etc.

2. Distribution - Restrictions on the firm's payouts to other stakeholders, most commonly dividend payouts to stockholders

3. Investing - Restrictions on the firm's mergers, acquisitions, and capital expenditures

4. Collateral - Restrictions on the amount and type of acceptable collateral the firm must post to secure the loan

We record a 0/1 indicator variable for a change in each of the four covenant types, with 1 representing a change and 0 representing otherwise.

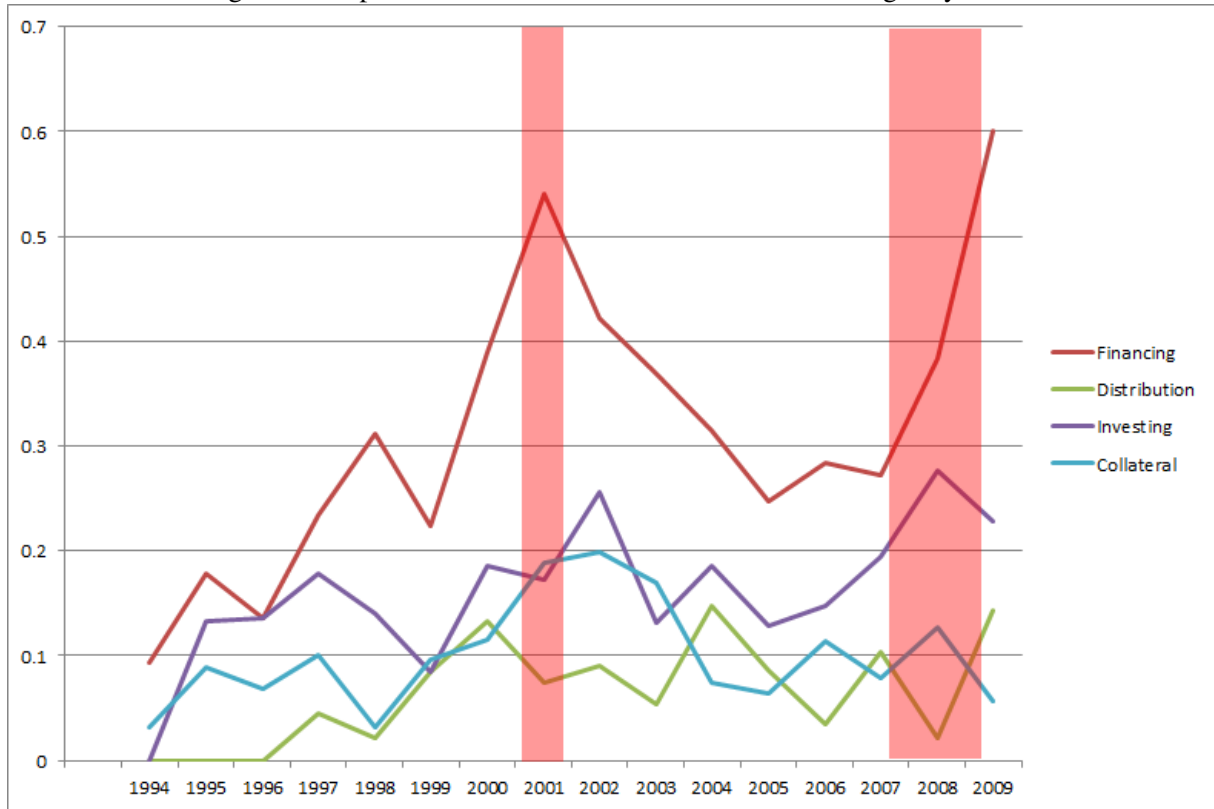Figure 2: Proportion of Amendments with Covenant Changes by Year

Figure 2 shows the proportion of renegotiations with covenant changes classified by type by year with recession bars drawn. The most common changes are to the financing covenants, roughly followed by changes to the investing covenants. We see that changes to all covenant types tend to increase in recession periods, particularly changes to financing covenants. These changes are likely due to the large number of waivers and amendments granted to correct financing covenant violations during recessions.

Table 4 shows the estimation of a probit model on a the indicator representing changes to the covenants for each of the four types. The probability model is identical to the model used in Table 2 for renegotiation probability, except here we are predicting the probability of covenant changes in each of the four classes. Each column represents a separate probit estimation, the coefficients are the marginal effects, and the numbers in parenthesis are the cluster-adjusted z-statistics.

Interestingly, high commercial bank loan losses tend to increase the probability of a financing covenant amendment. It is possible that poor commercial bank health increases increases the relative bargaining power of the borrower, and so renegotiation is thus more likely. As the unemployment rate increases relative to the previous event, changes to the distribution covenants become more likely.

Overall, the results in Table 4 are statistically weak. This suggests that covenant changes may be largely driven by firm-specific features and not the overall economy.

4   Further Work

This study is largely descriptive in showing that renegotiation activity is correlated to trends in the macroeconomy and the health of the commercial banking sector. Looking forward, we need a better

Table 4: Probability of Covenant Amendment (Marginal Effects)

	Financing		Distribution		Investing		Collateral	
	1	2	3	4	5	6	7	8
Macroeconomic Variables								
Baa-AAA spread	0.091834		0.028646		0.051879		0.02603	
	(1.27)		(1.15)		(1.33)		(0.62)	
Δ Baa-AAA spread	0.028931		-0.08562		0.082885		0.002959	
	(0.16)		(-0.55)		(0.79)		(0.02)	
Value Weighted Equity Return	0.007182		-0.00256		0.001226		-0.00332	
	(1.54)		(-0.11)		(0.37)		(-1.36)	
Recession Indicator	0.084659		-0.01766		0.03644		-0.02054	
	(1.27)		(-0.55)		(0.82)		(-0.44)	
Unemployment Rate	-0.01534		-0.0182		-0.00092		-0.0085	
	(-0.49)		(-1.04)		(-0.05)		(-0.58)	
Δ Unemployment Rate	0.270241		0.136875		0.052766		0.066009	
	(1.89)		(2.10)*		(0.64)		(0.61)	
Commercial Bank Health								
Loan Losses / Net Income winsorized		0.591811		0.037825		0.222397		0.208223
		(3.4)**		(0.45)		(1.57)		(1.84)
Δ Loan Losses / Net Income winsorized		-0.17338		-0.0279		0.022378		-1.19139
		(-1.11)		(-0.37)		(0.20)		(-1.56)
Total Liabilities / Total Assets (Leverage)		-2.32094		-1.12747		-2.09332		0.448927
		(-0.81)		(-0.70)		(-0.99)		(0.26)
Δ Total Liabilities / Total Assets (Leverage)		2.473468		-3.08415		2.750502		5.681455
		(0.58)		(-1.19)		(0.79)		(1.90)*

understanding of why this is the case. What are the mechanisms linking the macroeconomy to renegotiation? Could it be changing incentives, information, or uncertainty? Given the limited data available (and the time-intensive nature of data collection) these questions are difficult to answer. However, given the importance of renegotiation of bank debt in the world of corporate finance, the answers are critical in furthering the study of financial contracting.

5   Conclusion

In this paper, we find that renegotiation is more likely to occur in times of lower unemployment, lower credit spreads, and outside of recessions. Renegotiated maturity, facility amount, and interest rate spreads are more favorable for the borrower in good economic times. Finally, we find significant evidence that the commercial banking sector not only significantly increases the probability of renegotiation, but also leads to more favorable terms for the borrower.

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