Paper I

Table 1

Summary statistics.

Full sample				Random sample			
Variable	Mean	Median	St. Dev.	Variable	Mean	Median	St. Dev.
Line of credit variables				*Line of credit variables*			
Has line of credit {0,1}	0.817	1.000	0.386	Has line of credit {0,1}	0.748	1.000	0.434
				Total line of credit/assets	0.159	0.112	0.169
				Unused line of credit/assets	0.102	0.069	0.125
				Used line of credit/assets	0.057	0.000	0.097
				Total line/(total line + cash)	0.512	0.569	0.388
				Unused line/(unused line + cash)	0.450	0.455	0.374
				Violation of financial covenant {0,1}	0.080	0.000	0.271
Firm characteristics				*Firm characteristics*			
Book debt/assets	0.204	0.172	0.191	Book debt/assets	0.205	0.170	0.196
EBITDA/(assets − cash)	0.025	0.125	0.360	EBITDA/(assets − cash)	0.034	0.126	0.355
Tangible assets/(assets − cash)	0.340	0.278	0.240	Tangible assets/(assets − cash)	0.330	0.273	0.226
Net worth, cash adjusted	0.443	0.452	0.235	Net worth, cash adjusted	0.457	0.468	0.232
Assets − cash	1,615	102	11,000	Assets − cash	1,433	115	7,703
Market-to-book, cash adjusted	3.022	1.539	3.622	Market-to-book, cash adjusted	2.874	1.518	3.472
Industry sales volatility	0.033	0.027	0.124	Industry sales volatility	0.044	0.036	0.032
Cash-flow volatility	0.171	0.062	0.260	Cash-flow volatility	0.149	0.067	0.216
Not in an S&P index {0,1}	0.845	1.000	0.362	Not in an S&P index {0,1}	0.711	1.000	0.453
Traded over the counter {0,1}	0.321	0.000	0.467	Traded over the counter {0,1}	0.207	0.000	0.406
Firm age (years since IPO)	15	11	12	Firm age (years since IPO)	14	8	13

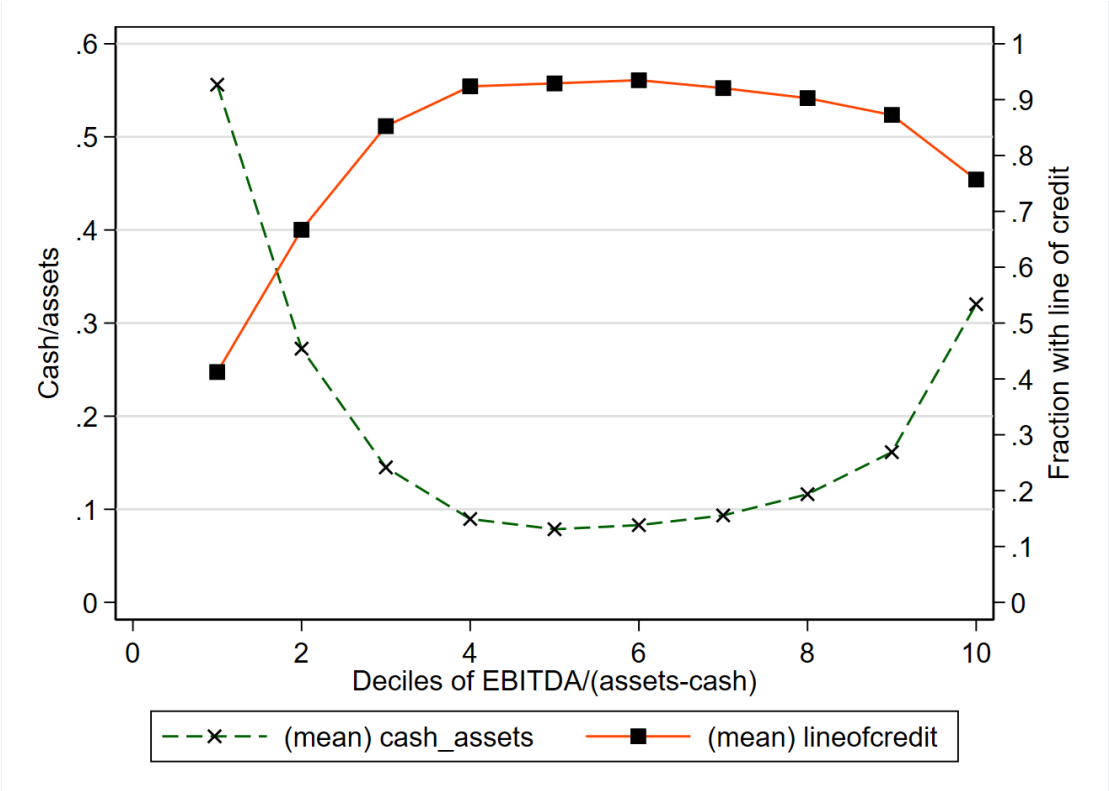
Table 3

Bank lines of credit and firm characteristics

Dependent variable Regression type	Firm has line of credit {0,1} Probit (marginal effects)		Total line/ (total line + cash) OLS		Unused line/(unused line + cash) OLS	
Sample	Full (1)	Random (2)	Random (3)	With line of credit (4)	Random (5)	With line of credit (6)
[EBITDA/ (assets - cash)]$_{t-1}$	0.080**	0.099	0.031	0.007	0.037	0.072
	(0.011)	(0.061)	-0.043	(0.060)	(0.040)	(0.058)
[Tangible assets/ (assets - cash)]$_{t-1}$	0.016	0.072	-0.001	-0.066	-0.014	-0.089
	(0.019)	(0.095)	-0.077	(0.066)	(0.073)	(0.072)
[Ln(assets - cash)]$_{t-1}$	0.0371**	0.050*	0.040*	0.006	0.044**	0.021
	(0.004)	(0.019)	-0.014	(0.011)	(0.013)	(0.012)
[Net worth, cash adjusted]$_{t-1}$	-0.101**	-0.068	-0.126*	-0.149**	-0.061	-0.040
	(0.017)	(0.076)	(0.060)	(0.057)	(0.056)	(0.060)
[Market-to-book, cash adjusted]$_{t-1}$	-0.0118**	-0.021**	-0.028**	-0.039**	-0.023**	-0.032**
	(0.001)	(0.005)	(0.004)	(0.005)	(0.004)	(0.005)
[Industry sales volatility]$_{t-1}$	1.619**	4.220*	1.641	-0.412	1.559	-0.232
	(0.328)	(0.150)	(1.070)	(0.875)	(1.090)	(1.037)
[Cash-flow volatility]$_{t-1}$	-0.273	-0.480**	-0.771**	-0.824**	-0.587**	-0.596**
	(0.035)	(0.150)	(0.131)	(0.160)	(0.123)	(0.162)
[Not in an S&P index{0,1}]	0.047**	0.070	0.042	-0.014	0.016	-0.028
	(0.015)	(0.069)	(0.042)	(0.034)	(0.042)	(0.036)
[Trade over the counter{0,1}]	-0.005**	-0.013	-0.010	-0.005	-0.013*	-0.011
	(0.002)	(0.008)	(0.006)	(0.005)	(0.006)	(0.006)
Ln[Firm age (years since IPO)]$_{t-1}$	0.002	-0.031	-0.054	-0.059*	-0.0290	-0.031
	(0.008)	(0.035)	(0.028)	(0.025)	(0.027)	(0.026)
Number of observations	23280	1536	1536	1144	1534	1142
Number of firms	4418	289	289	237	289	237
R^2	0.21	0.29	0.30	0.34	0.39	0.27

Figure 1

Use of line of credit versus cash holdings across cash-flow distribution



Paper II

Table II

Summary Statistics

Table II

	Mean	Median	*SD*
Capital structure variables			
Net debt issuance (basis points)	74.3	0.0	495.5
Net equity issuance (basis points)	39.9	0.2	113.8
ık debt$_t$/assets$_t$	0.272	0.229	0.251
Covenant control variables			
worth$_t$/assets$_t$	0.430	0.477	0.373
working capital$_t$/assets$_t$	0.170	0.168	0.327
h$_t$/assets$_t$	0.165	0.063	0.214
TDA$_t$/assets$_{t-1}$	-0.001	0.023	0.081
h flow$_t$/assets$_{t-1}$	-0.017	0.015	0.095
income$_t$/assets$_{t-1}$	-0.032	0.004	0.097
rest expense$_t$/assets$_{t-1}$	0.006	0.004	0.007
Other control variables			
·ket-to-book ratio$_t$	2.294	1.560	3.092
gible assets$_t$/assets$_t$	0.307	0.232	0.255
assets$_t$)	4.475	4.527	2.352

Table III

		Table III		
Panel A: Fixed Effects				
Dependent Variable: Net debt issuance$_t$/assets$_{t-1}$ (Basis Points)				
	(1)	(2)	(3)	(4)
Covenant violation$_t$	14.0	1.7	2.5	2.5
	(7.7)	(8.0)	(7.5)	(8.0)
Covenant violation$_{t-1}$	-69.9**	-69.9**	-74.3**	-63.5**
	(8.2)	(8.4)	(7.9)	(8.2)
Covenant control variables	None	Covenant control variables	Covenant control variables, covenant interaction control variables	Control variables, control variables squared, control variables to the third power, and quintile indicators for each control
Number of firm-quarters	94,316	94,116	94,169	94,116
Number of firms	5,975	5,919	5,972	5,919
R^2	0.007	0.213	0.106	0.246
Panel B: First Differences				
Dependent Variable: Change in Net debt issuance$_t$/assets$_{t-1}$ (Basis Points)				
	(1)	(2)	(3)	(4)
Covenant violation$_t$	4.7	-3.8	1.5	-0.5
	(11.2)	(11.0)	(10.7)	(3.2)
Covenant violation$_{t-1}$	-42.8**	-51.0**	-48.6**	-1.5
	(11.6)	(11.5)	(11.1)	(3.2)
Covenant control variables	None	Covenant control variables	Covenant control variables, covenant interaction control variables	Control variables, control variables squared, control variables to the third power, and quintile indicators for each control
Number of firm-quarters	94,234	85,342	77,241	77,241
Number of firms	5,972	5,822	5,816	5,816
R^2	0.004	0.175	0.168	0.922
** Statistically distinct from zero at the 1% level.				

Essay questions

1. By comparing with the original results, my results generally are consistent except for (1) some variables in Table 3 of the paper in Bank Lines of Credit and (2) some values in Column 3 & 4 from Table III, Panel B of the paper Control Rights and Capital Structure.
2. Possible reasons:
   (1) In my replication results, EBITDA/(assets – cash)$_{t-1}$ tends to be less

statistically distinct, while cash-flow volatility is more statistically distinct than the results in the original paper. This may be a result of Winsorization. The data may be concentrated around some fixed value, and it may reduce the significance of regressions results by winsorizing them. This may also be due to slight changes in the variables of the Compustat database.

(2) I obtained values in different directions of Covenant violation$_t$ and Covenant violation$_{t-1}$ in Columns 3 and 4 of Table III, Panel B. This may be a result of wrong data in the S&P rating dataset, as we can obtain the annual S&P rating data from Compustat rather than the quarterly data. Some firms may not have S&P rating data for certain quarters in a year. However, my code assumes that the firm has an S&P rating in all four quarters in one year even if the firm only has data in the last quarter. Also, some values were missed after datasets were merged. This may also lead to inaccuracy of the replication results.

3. Regarding question (c), covenant violations can lead to a reduction or loss of a line of credit (LC) due to the breach of agreed terms. Lenders use covenants to mitigate risk, and violations mean an increased level of risk, resulting in reduced credit or termination of the LC to protect their interests.
4. The number of lagged periods also influences the results.
5. As for Paper I, the results in Table 3 explain how these financial variables interact and affect the decision-making process of firms regarding their credit line usage. Among these variables, Ln(assets-cash)$_{t-1}$, Net worth (cash adjusted$_{t-1}$), and Market-to-book (cash adjusted$_{t-1}$) generally are statistically significant in results. This represents that these variables are important in examining the association between firm characteristics and likelihood of having a line of credit.
6. As for research ideas, the line of credit research may have more available data after the COVID-19 pandemic and it is worth investigating to provide more suggestions on corporate liquidity management.

(Word count: 400)