

Online Appendix

Does the Lack of Financial Stability Impair the Transmission of Monetary Policy?

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Online Appendix A: Variable Definitions

The table provides descriptions of all variables, together with their units of measurement. All financial variables are winsorized at the 1st and 99th percentile and measured in real terms with 2006 as the base year using the Consumer Price Index (CPI) as published by the OECD. The second table shows further descriptive statistics of variables for the January 2006 to June 2010 period. This period is also split into the financial crisis period from August 9, 2007 to June 30, 2010, the financial crisis until the full allotment period from August 9, 2007 to October 7, 2008, and the full allotment period from October 8, 2008 until June 30, 2010.

Variable	Unit	Description
ECB Liquidity		
Adjusted Liquidity in Banking Sector	Log (€ billion)	Natural logarithm of the absolute amount of liquidity in the banking sector. It is calculated as the logarithm of the sum of banks' current account and deposit facility holdings with the ECB. The items used for the calculation are published by the ECB ex post on a daily basis in the "Data on daily liquidity conditions." The variable is centered around its mean value in 2006.
<i>Bank Risk Variables</i>		
Bank Risk	Integer	Credit default swap spread in bps on the bank's senior unsecured debt with a five year maturity.
High Bank Risk	Dummy	Dummy variable, derived from an iterative procedure. In this procedure, we use (on a weekly basis) the minimum CDS spread of banks rated A1 or below as threshold and classify banks with a higher spread as high-risk banks. To ensure that low- and high-risk banks are sufficiently different, we then iteratively decrease this threshold in steps of 0.5bps until the ratio of the average spread of low- and high-risk banks is at least two in each week.
<i>Deposit Transaction Variables</i>		
ECB Deposit Facility Rate	%	Interest rate at which banks can deposit funds overnight at the ECB deposit facility. In theory, it constitutes the lower bound interest rate for the interbank short-term market.
Deposit Spread	bps	Spread between the deposit rate and the ECB deposit facility rate.
log(Notional Deposit Amount)	Log (€)	Natural logarithm of the notional € deposit amount of the transaction.
Duration	days	The duration of the deposit transaction ranges from overnight up to one week.
Bank Competition	Integer	Calculated as the sum of the squared market share of each bank over the last week using deposit volume.
<i>Bank Accounting Variables</i>		
log(Total Assets)	Log (€ million)	Natural logarithm of the bank's total assets in €-million as reported on the balance sheet.
Leverage		Ratio of total liabilities to total assets as reported on the balance sheet.
Off-Balance-Sheet Exposure	%	Ratio of off-balance-sheet items divided by the sum of total assets and off-balance-sheet items. The amount of off-balance-sheet items is used from Bankscope. It is calculated as the sum of managed securitized assets reported off-balance sheet, other off-balance sheet exposure to securitizations, guarantees, acceptances and documentary credits reported off-balance sheet, committed credit lines, and other contingent liabilities.
Return on Assets	%	Return on assets as calculated by Bankscope.
Total Asset Growth	%	Annual asset growth as calculated by Bankscope based on annual balance sheet data.
Net Interest Margin	%	Net interest margin as calculated by Bankscope.
Cost/Income Ratio	%	Ratio of administrative costs to income excluding increase of risk provisions as calculated by Bankscope.
Net Loans/Customer Deposits	%	Ratio of net loans to customer deposits as calculated by Bankscope.
Non-performing Loans/Total Loans	%	Ratio of non-performing loans to gross loans as calculated by Bankscope.
Net Derivative Exposure / Total Assets	%	Ratio of the difference between derivative assets and derivative liabilities to total assets.
Liquid Assets/Short-Term Funding	%	Ratio of liquid assets to short-term funding as calculated by Bankscope.
Total Deposits/Total Assets	%	Ratio of total deposits and short-term funding to total assets based on annual balance sheet data.

<i>Borrower Variables</i>		
log(Total Assets)	Log (€ million)	Natural logarithm of the firm's total assets in €-million as reported on the balance sheet.
Leverage	%	Ratio of total liabilities to total assets as reported on the balance sheet.
Current ratio	%	Ratio of current assets to current liabilities as reported on the balance sheet.
Coverage	%	Ratio of EBITDA to interest expenses as reported in the income statement.
Market-to-Book	%	Ratio of the sum of book value of liabilities and market value of equity to book value of total assets. The data are collected from Compustat for firms available in Compustat North America. For firms only available in Compustat Global we use the market-to-book ratio as reported by Datastream.
Tangibility	%	Ratio of tangible assets (property, plant and equipment) to total assets as reported on the balance sheet.
Log(Number of Loans of Borrower)	Log (Integer)	Natural logarithm of the number of loans (packages) of the borrower in LPC DealScan from 1982 to the start of the loan.
<i>Credit Rating</i>		
Investment Grade Rating	Dummy	Dummy variable equal to one, if the borrower's S&P long-term issuer rating is BBB- or better.
Non-Investment Grade Rating	Dummy	Dummy variable equal to one, if the borrower's S&P long-term issuer rating is BB+ or worse.
Not Rated	Dummy	Dummy variable equal to one if the borrower has no S&P long-term issuer rating.
<i>Syndicated Loan Variables</i>		
AISD	bps	Coupon spread over LIBOR plus one time fees on the drawn portion of the loan as stated in DealScan
log(Facility Size)	log (€ million)	Natural logarithm of the loan facility amount in year 2006 € million.
log(Maturity in Months)	log (Integer)	Natural logarithm of the maturity of the loan in months
Secured	Dummy	Dummy variable equal to one if the loan is secured.
Performance Pricing	Dummy	Dummy variable equal to one if the loan contains a performance pricing grid.
<i>Loan Type</i>		
Term Loan	Dummy	Dummy variable if the loan is defined as type "Term Loan" in DealScan.
Revolver/Line \geq 1 Yr.	Dummy	Dummy variable if the loan is defined as type "Revolver/Line \geq 1 Yr." in DealScan.
364-Day Facility	Dummy	Dummy variable if the loan is defined as type "364-Day Facility" in DealScan.
Bridge Loan	Dummy	Dummy variable if the loan is defined as type "Bridge Loan" in DealScan.
Revolver/Line $<$ 1 Yr.	Dummy	Dummy variable if the loan is defined as type "Revolver/Line $<$ 1 Yr." in DealScan.
<i>Loan Purpose</i>		
Corporate purposes	Dummy	Dummy variable if the loan is defined to have the primary purpose "Corp. purposes" in DealScan.
M&A related	Dummy	Dummy variable if the loan is defined to have a M&A-related primary purpose in DealScan (e.g., LBO, MBO, SBO, Takeover).
Debt Repayment	Dummy	Dummy variable if the loan is defined to have the primary purpose "Debt Repay" in DealScan.
Working Capital	Dummy	Dummy variable if the loan is defined to have the primary purpose "Work. cap" in DealScan.
Other	Dummy	Dummy variable if the loan is defined to have a different primary purpose in DealScan than those above.
<i>Time Indicator Variables</i>		
Crisis until Full Allotment	Dummy	Dummy variable, which is one from August 8, 2007 until October 7, 2008.
Full Allotment Period	Dummy	Dummy variable, which is one from October 8, 2008 until the end of our observation period June 30, 2010. On October 8, 2008 the ECB announced that it would allot the full amount banks request via the refinancing operations at a fixed rate given sufficient adequate collateral, in contrast to the prior competitive tender with limited allotment.

Addition Control Variables

3-Month EURIBOR-EONIA Swap Spread	bps	Spread between the 3-month EURIBOR and the 3-month EONIA swap. It is an indicator for the risk in the market excluding interest rate change risk and interest rate expectations.
Quarterly EU GDP growth (%)	%	The quarterly growth rate of the gross domestic product at market prices of the Euro area using calendar and seasonally adjusted data, as published by the ECB.
CISS	continuous variable	Composite Indicator of Systemic Stress as published by the ECB.
Main refinancing rate	%	The interest rate on the main refinancing operations (MRO) as published by the ECB.
End of Reserve Maintenance Period	Dummy	Dummy variable, which is one on the last day of the ECB's reserve maintenance period.

Online Appendix B: Descriptive Statistics

	Total Period (2006:Q1 - 2010:Q2) 43 banks; 40,638 deposits; 2,632 loans					Crisis until Full Allotment (Aug. 9, 2007 - Oct. 7, 2008) 35 banks; 12,078 deposits; 725 loans					Full Allotment Period (Oct. 8, 2008 - 2010:Q2) 40 banks; 20,104 deposits; 775 loans				
	Mean	St.Dev.	Min	Median	Max	Mean	St.Dev.	Min	Median	Max	Mean	St.Dev.	Min	Median	Max
CENTRAL BANK LIQUIDITY															
Adjusted Liquidity in Banking Sector (€ billion)	81.80	98.98	-62.12	34.84	362.33	35.21	28.50	-43.98	33.70	203.05	183.14	88.14	-62.12	201.23	362.33
CORPORATE SHORT-TERM DEPOSIT MARKET															
Deposit Rate (bps)	226.70	162.88	3.00	274.00	498.00	398.46	21.00	225.00	399.00	498.00	81.15	94.19	3.00	29.00	475.00
Deposit Spread (bps)	51.41	50.36	-30.00	58.00	132.00	93.29	19.16	-18.00	98.00	132.00	4.16	20.80	-30.00	0.00	70.00
log(Notional Deposit Amount)	17.15	1.62	13.12	17.37	19.81	17.20	1.71	13.12	17.50	19.81	17.14	1.50	13.15	17.19	19.29
Average Duration (days)	1.86	1.55	1.00	1.00	7.00	1.83	1.53	1.00	1.00	7.00	1.89	1.56	1.00	1.00	7.00
Bank Competition	0.10	0.02	0.06	0.10	0.20	0.10	0.02	0.06	0.10	0.16	0.10	0.02	0.07	0.09	0.15
LOAN CHARACTERISTICS															
All in Spread Drawn (bps)	183.45	145.66	10.00	175.00	800.00	160.40	128.66	14.00	125.00	550.00	306.52	148.86	35.00	300.00	800.00
log(Maturity in Months)	3.83	0.64	1.61	4.09	5.19	3.71	0.72	1.61	4.09	5.19	3.64	0.55	1.79	3.58	4.97
Log(Facility Size)	19.76	1.28	15.40	19.81	23.07	20.01	1.36	15.40	20.18	23.07	19.74	1.08	15.95	19.78	22.57
log(Number of Previous Loans of Borrower)	1.53	0.91	0.00	1.61	3.87	1.41	0.94	0.00	1.61	3.43	1.76	0.87	0.00	1.95	3.87
BANK CHARACTERISTICS															
Low Bank Risk CDS spread	49.59	34.40	6.00	50.00	202.00	61.95	30.40	6.00	58.00	202.00	71.32	27.46	11.00	68.00	138.00
High Bank Risk CDS spread	109.87	64.38	12.00	104.00	775.00	110.20	44.80	42.00	120.00	510.00	126.85	60.69	52.00	124.00	775.00
Total Assets (€ million)	13.28	0.74	11.46	13.29	14.74	13.33	0.70	11.46	13.31	14.74	13.30	0.80	11.48	13.29	14.73
Leverage (%)	96.07	1.79	90.30	96.69	98.11	95.82	2.04	90.30	96.62	98.11	96.10	1.74	90.48	96.74	98.04
Off-Balance-Sheet Exposure (%)	21.64	16.48	0.00	21.63	66.64	21.99	15.10	0.00	21.21	62.03	21.85	17.16	0.00	22.22	66.64
Return on Assets (%)	0.18	0.54	-1.60	0.29	1.14	0.45	0.29	-0.56	0.45	1.14	-0.09	0.59	-1.60	0.07	1.12
Total Asset Growth (%)	7.72	20.84	-35.66	4.12	115.77	14.68	21.44	-12.00	8.94	115.77	1.69	20.06	-35.66	-0.96	63.66
Net Interest Margin (%)	1.01	0.54	0.31	0.83	2.97	0.91	0.47	0.31	0.79	2.97	1.07	0.59	0.31	0.83	2.95
Cost/Income Ratio (%)	70.62	22.19	45.40	65.42	167.93	65.32	13.71	45.40	62.80	113.25	77.87	27.50	45.40	69.09	167.93
Net Loans/Customer Deposits (%)	143.90	44.04	66.45	134.88	242.60	145.93	43.25	66.45	134.65	242.60	145.34	44.74	66.47	141.47	242.60
NPL/Loans (%)	2.87	1.54	0.26	2.76	8.31	2.38	1.40	0.26	1.65	5.69	3.28	1.47	0.49	3.19	8.31
Net Derivative Exposure (%)	-0.17	2.18	-7.89	-0.04	6.33	-0.48	1.30	-7.89	-0.04	2.29	0.01	2.70	-7.55	0.00	6.33
Liquid Assets / Short-Term Funding (%)	57.03	32.59	12.66	48.67	134.98	62.39	34.34	12.66	51.58	134.98	54.47	31.93	12.75	49.70	133.84
Total Deposits/Total Assets (%)	55.34	13.10	30.90	55.43	82.05	55.50	13.37	30.90	53.95	82.05	54.36	13.20	32.18	55.43	80.94
BORROWER CHARACTERISTICS															
log(Total Assets (€ million))	8.37	1.34	2.06	8.71	10.10	8.36	1.38	4.09	8.59	10.10	8.45	1.33	2.21	8.82	10.08
Leverage	0.55	0.13	0.07	0.58	0.80	0.53	0.14	0.11	0.55	0.79	0.57	0.12	0.19	0.60	0.80
Current ratio	1.68	1.27	0.21	1.38	12.87	1.63	1.07	0.25	1.44	7.52	1.66	1.08	0.37	1.46	12.87
Coverage	10.58	13.95	-15.84	6.74	169.91	11.85	13.52	-15.84	8.54	132.11	8.94	11.61	-7.22	6.15	169.91
Market to Book	1.68	0.85	0.50	1.43	6.73	1.92	1.00	0.76	1.68	6.73	1.40	0.77	0.50	1.19	4.46
Tangibility	0.39	0.25	0.02	0.34	0.93	0.36	0.26	0.02	0.28	0.93	0.41	0.26	0.02	0.41	0.93

Online Appendix C: Transmission of monetary policy to deposits

(Table 2 in the paper showing the full set of control variables)

	Total Period (1)	Pre-Financial Crisis (2)	Crisis until Full Allotment (3)	Full Allotment Period (4)
ECB Market Liquidity				
<i>Central Bank Liquidity</i>				
Bank Risk	-27.052***	4.426	-25.972***	-27.474***
<i>High Bank Risk</i>	0.621	0.193	1.193	2.974
Bank Accounting Variables				
<i>log(Total Assets)</i>	-4.864***	-0.727	-1.778***	-5.277***
<i>Leverage</i>	0.106	0.329**	0.268	-1.058
<i>Off-Balance-Sheet Exposure</i>	0.005	0.046	0.006	-0.112
<i>Return on Assets</i>	-1.137	-5.260*	-0.968	-0.069
<i>Total Asset Growth</i>	0.031**	-0.010	-0.007	0.036
<i>Net Interest Margin</i>	-1.545	1.458**	0.502	-4.606
<i>Cost/Income Ratio</i>	-0.023	-0.123**	0.003	-0.046*
<i>Net Loans/Customer Deposits</i>	-0.037*	-0.014**	0.009	-0.032
<i>Non-performing Loans/Total Loans</i>	-0.017	-0.346***	-0.079	0.475
<i>Net Derivative Exposure / Total Assets</i>	0.016	-0.182***	0.197	0.280
<i>Liquid Assets/Short-Term Funding</i>	-0.013	-0.032	0.015	-0.010
<i>Total Deposits/Total Assets</i>	-0.020	-0.094	0.041	-0.049
Further Control Variables				
<i>log(Notional Deposit Amount)</i>	-0.773**	-1.050*	-0.410**	-1.638**
<i>Deposit Duration</i>	1.287***	0.461***	1.326***	1.421***
<i>Bank Competition</i>	3.842	-20.715	-3.702	49.623
<i>3 Month EURIBOR-EONIA Swap Spread</i>	-44.856***	-52.421	-43.195***	-45.900***
<i>Crisis Until Full Allotment</i>	1.534			
<i>Full Allotment Period</i>	-90.406***			
Firm FE	Yes	Yes	Yes	Yes
Time (quarter) FE	Yes	Yes	Yes	Yes
Accounting Standard FE	Yes	Yes	Yes	Yes
Observations	11,533	2,045	3,866	5,560
R-squared	0.933	0.374	0.341	0.604

Online Appendix D: Deposit Transaction Data

Online Appendix D 1: Transmission of monetary policy to deposits

The table reports OLS regression results of *Deposit Spread* on *Aggregate Central Bank Liquidity*, bank risk and other control variables. It shows 4 different regression specifications over different time periods, indicated at the top of each regression. *Central Bank Liquidity* is measured by the adjusted liquidity in the banking sector. *High Bank Risk* is a dummy variable defined using banks' CDS spreads and explained in detail in Appendix A1. All variables are defined in Appendix A1. Bank accounting standard FE are either the general accepted accounting principles (GAAP) of the respective country of the bank or the international financial reporting standards (IFRS). Bank accounting variables are used as stated in the annual report in the year prior to the transaction. A constant is included but omitted. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level using two-way clustered standard errors at the bank- and at the week-level (unreported for brevity) using the method as proposed by Cameron, Gelbach and Miller (2011) and Thompson (2011) and the code provided by Petersen (2009).

	Total Period (1)	Pre-Financial Crisis (2)	Crisis until Full Allotment (3)	Full Allotment Period (4)
ECB Market Liquidity				
<i>Central Bank Liquidity</i>	-28.997***	0.406	-21.687**	-35.648***
Bank Risk				
<i>High Bank Risk</i>	-0.115	-0.110	1.683	0.162
Bank Accounting Variables				
<i>log(Total Assets)</i>	-4.319***	-0.347	-2.172***	-4.681***
<i>Leverage</i>	0.128	0.416***	0.311	-0.762
<i>Off-Balance-Sheet Exposure</i>	-0.006	0.028	0.019	-0.082
<i>Return on Assets</i>	-1.212	-4.720**	-0.232	-0.511
<i>Total Asset Growth</i>	0.039***	-0.021	0.007**	0.032
<i>Net Interest Margin</i>	-3.409	1.854***	-2.308	-6.674*
<i>Cost/Income Ratio</i>	-0.009	-0.104**	-0.030	-0.021
<i>Net Loans/Customer Deposits</i>	-0.036**	-0.013**	-0.001	-0.032
<i>Non-performing Loans/Total Loans</i>	0.511	-0.178***	-0.406	1.180*
<i>Net Derivative Exposure / Total Assets</i>	0.113	-0.068	-0.083	0.511**
<i>Liquid Assets/Short-Term Funding</i>	-0.005	-0.019	-0.001	-0.001
<i>Total Deposits/Total Assets</i>	0.019	-0.070	0.025	-0.015
Further Control Variables				
<i>log(Notional Deposit Amount)</i>	-0.194	0.160**	0.069	-0.694
<i>Deposit Duration</i>	0.704***	0.295***	0.724*	0.660***
<i>Bank Competition</i>	0.427***	-0.040	0.414**	0.592***
<i>3 Month EURIBOR-EONIA Swap Spread</i>	-15.717*	56.222	-29.075**	-5.255
<i>End of Reserve Maintenance Period</i>	-8.239***	-6.834	-6.633	-14.102***
<i>Crisis Until Full Allotment</i>	-1.984			
<i>Full Allotment Period</i>	-52.048***			
Firm FE	Yes	Yes	Yes	Yes
Time (quarter) FE	Yes	Yes	Yes	Yes
Accounting Standard FE	Yes	Yes	Yes	Yes
Observations	31,201	4,963	10,179	16,059
R-squared	0.918	0.498	0.288	0.531

Online Appendix D 2: Transmission of monetary policy to deposits for high vs. low-risk banks

The table reports OLS regression results of the *Deposit Spread* of corporate deposits with a maximum maturity of 7 days on *Central Bank Liquidity*, bank risk and further control variables. It shows 6 different regression specifications over different time periods, indicated at the top of each regression. *Central Bank Liquidity* is measured as the adjusted liquidity in the banking sector. *High Bank Risk* is a dummy variable defined using banks' CDS spreads and explained in detail in Appendix A1. All variables are defined in Appendix A1. All control variables as shown in Table 2 are included. A constant is included but omitted. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level using two-way clustered standard errors at the bank- and at the week-level (unreported for brevity) using the method as proposed by Cameron, Gelbach and Miller (2011) and Thompson (2011) and the code provided by Petersen (2009).

	Financial Crisis Period		Crisis until Full Allotment		Full Allotment Period	
	(1)	(2)	(3)	(4)	(5)	(6)
ECB Market Liquidity						
<i>Central Bank Liquidity</i>	-30.062***		-21.814***		-36.173***	
<i>Central Bank Liquidity * High Bank Risk</i>		-31.392***		-10.72		-35.761***
<i>Central Bank Liquidity * Low Bank Risk</i>		-26.991***		-24.868***		-38.511***
Controls and Fixed Effects (FE)						
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Bank Risk * Time (quarter) FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Accounting Standard FE	Yes	Yes	Yes	Yes	Yes	Yes
Wald Test of Interaction Terms		0.3088		0.0025		0.2179
Observations	26,238	26,238	10,179	10,179	16,059	16,059
R-squared	0.899	0.899	0.301	0.303	0.535	0.535

Online Appendix D 3: Selection

The table reports results from different regressions to address possible selection concerns associated with the transmission of ECB liquidity to deposit spreads. In column (1), the data include all auctions and the banks' bids. The columns show OLS regression results of a dummy variable, which is one when a bank is selected in an auction and zero otherwise on control variables. *Bank Risk Ranking within Auction* is derived by ranking banks within an auction using their CDS spread and taking the logarithm of their rank, plus one. It only includes transactions with at least two banks bidding for a deposit amount. Columns (2) to (7) include data of executed deposit transactions aggregated at the bank-firm-week level. Columns (2) and (3) only include deposit transactions where on the same day no prior auction was initiated by the firm where no bid was selected. Columns (4) and (5) only include deposit transactions that were traded prior to 10:00 am on a given day. Columns (6) and (7) only include rolled over deposits, that is, amounts that are deposited again with the same notional after having matured. *Central Bank Liquidity* is measured as the adjusted liquidity in the banking sector. *High Bank Risk* is a dummy variable defined using banks' CDS spreads and explained in detail in Appendix A1. All variables are defined in Appendix A1. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level using two-way clustered standard errors at the bank- and at the week-level (unreported for brevity) using the method as proposed by Cameron, Gelbach and Miller (2011) and Thompson (2011).

Dependent Variable	Selection of Banks by Firms	Excluding transactions where another auction was canceled by the firm earlier on the same day		Early transactions (prior to 10am)		Rolled over funds	
	Financial Crisis Period Selected (Yes/No)	Crisis until Full Allotment Deposit Spread	Full Allotment Period Deposit Spread	Crisis until Full Allotment Deposit Spread	Full Allotment Period Deposit Spread	Crisis until Full Allotment Deposit Spread	Full Allotment Period Deposit Spread
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Bank Risk Ranking within Auction</i>	-0.003						
<i>Highest Bid of Auction</i>	0.473***						
ECB Market Liquidity							
<i>Central Bank Liquidity * High Bank Risk</i>		-12.210	-27.052***	18.458	-25.812***	-13.492	-33.894***
<i>Central Bank Liquidity * Low Bank Risk</i>		-28.781***	-25.930***	-16.589**	-27.344***	-24.659**	-31.243**
<i>High Bank Risk</i>		3.074	-14.636	9.415	9.502	-1.043	1.407
<i>log(Notional Deposit Amount)</i>		-0.667*	-1.921**	-0.311**	-1.287***	-0.454**	-1.500**
Control Variables	No	Yes	Yes	Yes	Yes	Yes	Yes
Bank Risk * Time (month) FE	No	Yes	Yes	Yes	Yes	Yes	Yes
Bank * Time (month) FE	Yes	No	No	No	No	No	No
Bank * Firm FE	Yes	No	No	No	No	No	No
Firm FE	No	Yes	Yes	Yes	Yes	Yes	Yes
Accounting Standard FE	No	Yes	Yes	Yes	Yes	Yes	Yes
Wald Test of Interaction Terms		0.0060	0.7988	0.0153	0.1557	0.074	0.493
Observations	44,961	2,963	4,222	323	1,086	270	636
R-squared	0.400	0.388	0.579	0.434	0.754	0.482	0.747

Online Appendix D 4: Endogeneity

Dependent Variable	Instrumental Variables Regression	
	Full Allotment Period	
	First Stage <i>Log(Deposit Volume)</i> (3)	Second Stage <i>Deposit Spread</i> (4)
ECB Market Liquidity		
<i>Central Bank Liquidity * High Bank Risk</i>		-29.384***
<i>Central Bank Liquidity * Low Bank Risk</i>		-33.543***
<i>High Bank Risk</i>		-8.299
<i>log(Notional Deposit Amount)</i>		-5.312
Further Controls and Fixed Effects (FE)		
<i>Friday</i>	0.067***	
<i>Fourth Quarter of Year</i>	0.051	
Control Variables	Yes	Yes
Bank Risk * Time (quarter) FE	Yes	Yes
Bank * Time (quarter) FE	Yes	Yes
Bank * Firm FE	No	No
Firm FE	Yes	Yes
Accounting Standard FE	Yes	Yes
Wald Test of Interaction Terms		0.443
Observations	16,059	16,059
R-squared		
F-statistic	7.46	
Underidentification test p-value	0.0014	
Overidentification test p-value	0.7431	

Online Appendix E: The Transmission of Central Bank Liquidity to Deposit and Loan Spreads (Bank Risk Fixed at Start of Financial Crisis)

The table reports OLS regression results of syndicated loan spreads on *Central Bank Liquidity*, bank risk, and further control variables. It shows six different regression specifications over different time periods. *Central Bank Liquidity* is measured as the average over the quarter prior to loan origination of the adjusted liquidity in the banking sector. *High Bank Risk* is a dummy variable defined using banks' CDS spreads. In this table, it is determined as explained in detail in Appendix A1 but using only the week of August 9, 2007, when the financial crisis started, and holding it constant for each bank in the following period. Panel A shows the results for the deposits and Panel B for the loan sample. All variables are defined in Appendix A1. Bank and borrower accounting variables are used as stated in the annual report in the year prior to the transaction. Constant term is included but omitted. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level using two-way clustered standard errors at the firm- and at the week-level (unreported for brevity) using the method as proposed by Cameron, Gelbach and Miller (2011) and Thompson (2011) and the code provided by Petersen (2009).

Bank Risk Fixed at Start of Financial Crisis						
Panel A: Deposits	Financial Crisis Period		Crisis until Full Allotment		Full Allotment Period	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Central Bank Liquidity</i>	-29.426***		-19.365***		-33.487***	
(1) <i>Central Bank Liquidity*High Bank Risk</i>		-31.101***		-7.765		-29.595***
(2) <i>Central Bank Liquidity*Low Bank Risk</i>		-29.067***		-18.773***		-34.398***
Borrower, Bank, Further Control Variables						
Bank Risk * Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Rating FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Industry Code FE	Yes	Yes	Yes	Yes	Yes	Yes
Loan Type, Purpose, Currency FE	Yes	Yes	Yes	Yes	Yes	Yes
Wald Test of Interaction Terms		0.298		0.001		0.272
Observations	24,115	24,115	10,074	10,074	14,041	14,041
R-squared	0.909	0.909	0.259	0.276	0.512	0.508
Panel B: Loans						
Panel B: Loans	Financial Crisis Period		Crisis until Full Allotment		Full Allotment Period	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Central Bank Liquidity</i>	-110.742**		263.225		-69.114	
(1) <i>Central Bank Liquidity*High Bank Risk</i>		-86.498		363.435		-37.126
(2) <i>Central Bank Liquidity*Low Bank Risk</i>		-131.195**		187.684		-109.163***
Borrower, Bank, Further Control Variables						
Bank Risk * Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Rating FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Industry Code FE	Yes	Yes	Yes	Yes	Yes	Yes
Loan Type, Purpose, Currency FE	Yes	Yes	Yes	Yes	Yes	Yes
Wald Test of Interaction Terms		0.3093		0.2636		0.0272
Observations	1,156	1,156	533	533	623	623
R-squared	0.753	0.754	0.806	0.806	0.721	0.722

Online Appendix F: Transmission of monetary policy to loans

(Table 5B in the paper showing the full set of control variables)

	Financial Crisis Period		Crisis until Full Allotment		Full Allotment Period	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Central Bank Liquidity</i>	-102.007**		-67.633		-82.160	
<i>(1) Central Bank Liquidity*High Bank Risk</i>		-76.103		-63.068		-49.064
<i>(2) Central Bank Liquidity*Low Bank Risk</i>		-150.996***		-75.281		-164.009***
Bank Risk						
<i>High Bank Risk</i>	26.321	46.224***	38.035***	67.459	12.649	-21.910
Borrower Accounting Variables						
<i>log(Total Assets)</i>	-6.018	-6.043	5.947	5.887	-19.202	-19.267
<i>Leverage</i>	-20.434	-19.645	59.281	59.955	-12.994	-8.865
<i>Current ratio</i>	-3.307	-3.939	20.003*	19.831*	-6.241	-6.307
<i>Coverage</i>	0.147***	0.148***	0.040	0.041	-0.037	-0.058
<i>Market to Book</i>	-16.473**	-16.657**	-11.208*	-11.350*	-31.888*	-32.590**
<i>Tangibility</i>	15.159	12.654	-36.744	-36.789	55.824	53.849
Bank Accounting Variables						
<i>log(Total Assets)</i>	13.996	14.948	-68.771	-67.251	67.195	68.089
<i>Leverage</i>	-1.946	-1.576	-3.769	-3.901	-4.714	-3.983
<i>Return on Assets</i>	-0.585	-0.375	-20.901	-20.883	4.413	4.740
<i>Total Asset Growth</i>	0.078	0.069	0.339	0.334	-0.164	-0.182
<i>Non-performing Loans/Total Loans</i>	4.179	4.018	11.713	12.006	-1.026	-1.639
Further Control Variables						
<i>log(Maturity in Months)</i>	14.431	14.510	20.668**	20.885**	-6.714	-5.913
<i>Secured</i>	26.181*	26.168*	36.057***	36.274***	-18.996	-19.611
<i>log(Facility Size)</i>	-18.098***	-18.017***	-14.157**	-14.100**	-10.594	-10.767
<i>log(Number of Loans of Borrower)</i>	6.619	6.322	0.523	0.635	6.080	5.466
<i>Performance Pricing</i>	-10.438	-10.058	-26.299**	-26.440**	1.868	3.015
<i>3 Month EURIBOR-EONIA Swap Spread</i>	97.255**	105.604**	8.999	10.135	419.524***	418.479***
<i>Quarterly EU GDP growth (%)</i>	-11.597	-11.442	-112.272***	-112.589***	12.824	13.468
<i>CISS</i>	-31.493	-40.237	-123.492*	-119.592*	-106.993	-111.671
<i>Main refinancing rate</i>	-29.946	-27.894	-326.993***	-324.569***	-156.712***	-145.823***
<i>Full Allotment Period</i>	-3.807	-5.642				
Bank Risk * Time (month) FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Rating FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Industry Code FE	Yes	Yes	Yes	Yes	Yes	Yes
Loan Type, Purpose, Currency FE	Yes	Yes	Yes	Yes	Yes	Yes
Wald Test of Interaction Terms (1) = (2)		0.0115		0.2557		0.0123
Observations	1,156	1,156	533	533	623	623
R-squared	0.755	0.756	0.824	0.824	0.733	0.735

Online Appendix G: Bank Risk and Bank and Firm Characteristics in 2006 and 2008

The table reports OLS regression results of *High Bank Risk* on control variables in 2006 using all loans issued in the crisis period in Panel A, and control variables in 2008 using all loans issued in the full allotment period in Panel B. All variables are defined in Appendix A1. A constant is included but omitted. When including rating fixed effects, the omitted rating category is a rating of A. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level using two-way clustered standard errors at the bank- and at the week-level (unreported for brevity) using the method as proposed by Cameron, Gelbach and Miller (2011) and Thompson (2011) and the code provided by Petersen (2009).

Panel A: Bank Risk using Control Variables in 2006 for crisis period loans

	I	II	III	IV	V	VI	VII
Borrower Accounting Variables							
<i>log(Total Assets)</i>	-0.005	0.010	0.014	0.018	0.020	0.027	0.031*
<i>Leverage</i>	0.193	0.184	0.225	0.171	0.245	0.214	0.050
<i>Current ratio</i>	0.030	0.059	0.018	0.040	0.033	0.033	0.020
<i>Coverage</i>	0.000	-0.000	0.000	-0.000	-0.000	-0.000	-0.001
<i>Market to Book</i>	-0.024	-0.014	-0.013	0.003	0.019	0.021	0.040
<i>Tangibility</i>	0.197*	0.085	0.147	0.004	-0.049	0.049	0.031
Further Control Variables	No	No	No	No	Yes	Yes	Yes
Bank Accounting Variables	No	No	No	No	No	Yes	Yes
Macroeconomic Fundamentals	No	No	No	No	No	No	Yes
Industry FE	No	Yes	No	Yes	Yes	Yes	Yes
Rating FE	No	No	Yes	Yes	Yes	Yes	Yes
AAA			0.281	0.249	0.294*	0.226	0.205
AA			0.219	0.232*	0.282**	0.232*	0.175
AA-			-0.434***	-0.407***	-0.315***	-0.309***	-0.301***
A+			0.219*	0.229***	0.330**	0.282**	0.304**
A-			0.035	0.031	0.179	0.151	0.085
BBB+			0.073	0.057	0.124	0.081	0.062
BBB			0.036	0.078	0.162	0.109	0.086
BBB-			0.272**	0.281**	0.329***	0.274***	0.152
BB+			0.084	0.064	0.099	0.061	0.008
BB			0.251**	0.200*	0.265*	0.252*	0.088
BB-			0.083	0.121	0.194*	0.154	0.058
B+			0.222**	0.200*	0.264***	0.218***	0.105*
B			-0.008	0.026	0.016	-0.043	-0.102
B-			0.133	0.236	0.204	0.083	-0.168
CCC+			0.288**	0.519***	0.495**	0.406**	0.116
CCC			0.414***	0.460***	0.421***	0.413***	0.368
D			0.366**	0.439***	0.356***	0.140	-0.096
NR			0.019	0.088	0.172	0.097	0.027
Observations	1,156	1,156	1,156	1,156	1,156	1,156	1,156
R-squared	0.012	0.035	0.065	0.085	0.130	0.176	0.246

Panel B: Bank Risk using Control Variables in 2008 for full allotment period loans

	I	II	III	IV	V	VI	VII
Borrower Accounting Variables							
<i>log(Total Assets)</i>	-0.037*	-0.032	-0.047**	-0.044*	-0.062***	-0.040**	-0.027**
<i>Leverage</i>	-0.030	-0.083	0.298	0.294	0.105	0.140	0.212**
<i>Current ratio</i>	0.048	0.049	0.050	0.060*	0.077*	0.051	0.061**
<i>Coverage</i>	0.000	0.001	0.001	0.001	0.000	-0.000	0.001
<i>Market to Book</i>	0.000	0.004	-0.012	-0.008	-0.029	-0.016	0.020
<i>Tangibility</i>	-0.072	-0.150	0.006	-0.034	0.007	-0.063	0.050
Further Control Variables	No	No	No	No	Yes	Yes	Yes
Bank Accounting Variables	No	No	No	No	No	Yes	Yes
Macroeconomic Fundamentals	No	No	No	No	No	No	Yes
Industry FE	No	Yes	No	Yes	Yes	Yes	Yes
Rating FE	No	No	Yes	Yes	Yes	Yes	Yes
AAA			0.327**	0.381**	0.379***	0.496***	0.534***
AA			0.447***	0.568***	0.528***	0.449***	0.337***
AA-							
A+							
A-			0.116	0.212	0.174	0.124	0.134*
BBB+			0.119	0.212	0.222	0.208	0.216***
BBB			0.098	0.212	0.220	0.160	0.161***
BBB-			0.300**	0.401**	0.396***	0.357**	0.249***
BB+			0.179	0.278	0.286	0.309**	0.306***
BB			0.260*	0.333**	0.329*	0.310**	0.202**
BB-			0.084	0.161	0.139	0.100	0.138*
B+			-0.074	-0.001	0.025	-0.005	-0.061
B			0.059	0.160	0.191	0.138	0.179**
B-			0.061	0.125	0.215	0.199	0.158***
CCC+			0.206*	0.240	0.289**	0.216	0.060
CCC			0.255*	0.379**	0.420**	0.273*	0.572***
D			0.251	0.382**	0.488***	0.177	0.066
NR			-0.029	0.103	0.100	0.048	0.099
Observations	623	623	623	623	623	623	623
R-squared	0.032	0.045	0.103	0.117	0.136	0.270	0.390

Online Appendix H: Number of loan observations by loan maturity, borrower size, and borrower bank-dependence

The table shows the number of loans in the full allotment period which we include in our regressions, split by loan maturity, firm size, and rating for each category. Loans are classified as short term when maturity ≤ 1 year, medium term when maturity is >1 year and ≤ 5 years, and long term when maturity > 5 years. Firm size classes are determined based on the 33rd and 67th percentile of total assets of all firms in the data sample.

	Maturity			Firm Size			Rating	
	Short-term	Medium-term	Long-term	Small	Medium	Large	No	Yes
High Bank Risk	80	352	39	133	176	162	53	418
Low Bank Risk	45	82	25	22	52	78	24	128
Total	125	434	64	155	228	240	77	546

Online Appendix I: Debt Capital Structure and Firm Characteristics: Intensive Margin

The table reports OLS regressions and propensity score (PS) matching results of changes in borrower characteristics of borrowers along the intensive margin in the full allotment period on bank risk and control variables. All variables are derived on the firm-level and measured in real terms with 2006 as the base year using the consumer price index (CPI) as published by the OECD. *Asset Growth* is the ratio of total assets in t divided by the value of total assets in $t-1$, minus 1. *Payouts* are total dividends, *Investment* is total invested capital, and *Employment* is the number of employees in thousand. The panels show regression results of either $pp.\Delta$ (percentage point differences), or $\log\Delta$ (log differences) or Δ (differences) from year t to $t+1$, t to $t+2$, and t to $t+3$, with t as the year when the loan is initiated in the full allotment period, on several control variables. *High Bank Risk* is a dummy variable defined using banks' CDS spreads and explained in detail in Appendix A1. *High Bank Risk | only High Bank Risk* is defined as a borrower having received loans from only high risk banks prior to the full allotment period, that is from January 2006 until October 7, 2008, and receiving a loan from a high risk bank in the full allotment period. *High Bank Risk | High and Low Bank Risk* is defined as a borrower having received loans from both low and high risk banks prior to the full allotment period and receiving a loan from a high risk bank in the full allotment period. All models include a borrower's log of *total assets*, *leverage*, *current ratio*, *coverage*, *market to book ratio*, and *tangibility*, and time (i.e. year) fixed effects (FE), borrower industry code FE, and borrower rating FE where for the propensity score matching models a Gaussian kernel estimator is used with a bandwidth of 0.01. All variables are defined in Appendix A1. Borrower accounting control variables are used as stated in the annual report in the year prior to the transaction. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level using heteroscedasticity-robust standard errors clustered at the firm-level.

Panel A: Term Loans/ Total Debt

Method	pp. Δ (t; t+1)			pp. Δ (t; t+2)			pp. Δ (t; t+3)		
	(1) OLS	(2) OLS	(3) PS	(4) OLS	(5) OLS	(6) PS	(7) OLS	(8) OLS	(9) PS
High Bank Risk	-2.531**		-1.959**	-3.705**		-6.799***	0.346		-6.293**
High Bank Risk only High Bank Risk		-3.275			-0.069			5.047	
High Bank Risk High and Low Bank Risk		-2.453**			-4.005**			-0.066	
Observations	212	212	176	213	213	182	211	211	181
R-squared	0.791	0.791		0.829	0.831		0.839	0.841	

Panel B: Revolving Loans/ Total Debt

Method	pp. Δ (t; t+1)			pp. Δ (t; t+2)			pp. Δ (t; t+3)		
	(1) OLS	(2) OLS	(3) PS	(4) OLS	(5) OLS	(6) PS	(7) OLS	(8) OLS	(9) PS
High Bank Risk	1.736		5.353**	0.885		5.098**	1.718		5.462***
High Bank Risk only High Bank Risk		-2.612			-5.678			-10.149	
High Bank Risk High and Low Bank Risk		2.266**			1.658*			3.116**	
Observations	191	191	143	195	195	149	195	195	149
R-squared	0.866	0.874		0.856	0.872		0.791	0.833	

Panel C: Notional Outstanding/ Total Debt

Method	pp. Δ (t; t+1)			pp. Δ (t; t+2)			pp. Δ (t; t+3)		
	(1) OLS	(2) OLS	(3) PS	(4) OLS	(5) OLS	(6) PS	(7) OLS	(8) OLS	(9) PS
High Bank Risk	1.654**		0.576	1.225*		-0.612	1.269		-1.067
High Bank Risk only High Bank Risk		2.492**			1.306			7.336**	
High Bank Risk High and Low Bank Risk		1.540*			1.213*			0.439	
Observations	250	250	201	248	248	201	248	248	201
R-squared	0.480	0.483		0.428	0.428		0.372	0.417	

Panel D: Total Liabilities

Method	log Δ (t; t+1)			log Δ (t; t+2)			log Δ (t; t+3)		
	(1) OLS	(2) OLS	(3) PS	(4) OLS	(5) OLS	(6) PS	(7) OLS	(8) OLS	(9) PS
High Bank Risk	-0.007		-0.015	0.001		-0.111	-0.007		-0.073
High Bank Risk only High Bank Risk		-0.016			-0.016			0.023	
High Bank Risk High and Low Bank Risk		-0.006			-0.006			-0.011	
Observations	267	267	215	261	267	209	258	258	206
R-squared	0.399	0.399		0.515	0.399		0.685	0.686	

Panel E: Payouts

Method	log Δ (t; t+1)			log Δ (t; t+2)			log Δ (t; t+3)		
	(1) OLS	(2) OLS	(3) PS	(4) OLS	(5) OLS	(6) PS	(7) OLS	(8) OLS	(9) PS
High Bank Risk	-0.370***		0.017	-0.206*		-0.124*	-0.334***		0.019
High Bank Risk only High Bank Risk		-0.087			0.251			0.475	
High Bank Risk High and Low Bank Risk		-0.401***			-0.241**			-0.370***	
Observations	229	229	177	223	223	171	219	219	167
R-squared	0.515	0.530		0.629	0.659		0.651	0.691	

Panel F: Capital Expenditures

Method	log Δ (t; t+1)			log Δ (t; t+2)			log Δ (t; t+3)		
	(1) OLS	(2) OLS	(3) PS	(4) OLS	(5) OLS	(6) PS	(7) OLS	(8) OLS	(9) PS
High Bank Risk	-0.144*		0.017	-0.079		-0.170*	-0.066		-0.158*
High Bank Risk only High Bank Risk		-0.330			0.041			0.019	
High Bank Risk High and Low Bank Risk		-0.112*			-0.099*			-0.079	
Observations	267	267	215	261	261	209	258	258	206
R-squared	0.561	0.573		0.575	0.582		0.672	0.674	

Panel G: Asset Growth

Method	pp. Δ (t; t+1)			pp. Δ (t; t+2)			pp. Δ (t; t+3)		
	(1) OLS	(2) OLS	(3) PS	(4) OLS	(5) OLS	(6) PS	(7) OLS	(8) OLS	(9) PS
High Bank Risk	-1.317		5.350	-0.021		1.163	1.448		3.020
High Bank Risk only High Bank Risk		-19.283*			-11.552**			-10.077*	
High Bank Risk High and Low Bank Risk		1.793			1.871			3.286	
Observations	267	267	215	261	261	209	258	258	206
R-squared	0.472	0.504		0.609	0.637		0.682	0.702	

Panel H: Investments

Method	log Δ (t; t+1)			log Δ (t; t+2)			log Δ (t; t+3)		
	(1) OLS	(2) OLS	(3) PS	(4) OLS	(5) OLS	(6) PS	(7) OLS	(8) OLS	(9) PS
High Bank Risk	0.003		-0.018	-0.004		-0.143*	-0.013		-0.052*
High Bank Risk only High Bank Risk		0.006			-0.022			0.024	
High Bank Risk High and Low Bank Risk		0.003			-0.001			-0.019	
Observations	267	267	215	261	261	209	258	258	206
R-squared	0.381	0.381		0.565	0.565		0.677	0.679	

Panel I: Employment

Method	Δ (t; t+1)			Δ (t; t+2)			Δ (t; t+3)		
	(1) OLS	(2) OLS	(3) PS	(4) OLS	(5) OLS	(6) PS	(7) OLS	(8) OLS	(9) PS
High Bank Risk	-1.019		-0.950	-2.107		-12.414**	-3.502		-31.133**
High Bank Risk only High Bank Risk		1.042			3.748			4.013	
High Bank Risk High and Low Bank Risk		-1.408			-2.890			-4.473	
Observations	249	249	190	243	243	190	240	240	187
R-squared	0.367	0.373		0.562	0.569		0.571	0.577	