

SUPPLEMENT TO “HAZARDOUS TIMES FOR MONETARY POLICY:
WHAT DO TWENTY-THREE MILLION BANK LOANS SAY ABOUT
THE EFFECTS OF MONETARY POLICY ON CREDIT RISK-TAKING?”
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TABLE A.I

SUMMARY STATISTICS OF ALL VARIABLES USED IN THE ESTIMATIONS ON THE INTENSIVE
MARGIN OF THE CHANGE IN THE COMMITTED AMOUNT OF GRANTED LOANS^a

Variable Name	Mean	Minimum	Q1	Median	Q3	Maximum	Standard Deviation
Dependent Variables							
$\Delta \text{LN}(\text{CREDIT AMOUNT}_{tbi})$	-0.02	-12.08	-0.10	0.00	0.02	12.08	0.47
Independent Variables							
$I(\text{FIRM RISK}_{it})$	0.11	0	0	0	0	1	0.32
$\Delta \text{OVERNIGHT RATE}_{t-1}$	-0.30	-7.27	-1.22	0.03	0.76	4.59	1.61
$\text{BANK CAPITAL}_{t-1b}$	6.14	3.18	4.56	5.45	7.17	92.56	2.38
$\text{LN}(\text{BANK CAPITAL}_{t-1b})$	1.75	1.16	1.52	1.70	1.97	4.53	0.34

^aThis table reports summary statistics for the sample with 6,564,964 observations from the 1988:II–2008:IV period. To improve the readability of the estimated coefficients we divide the $\Delta \text{OVERNIGHT RATE}$ by 100 in all subsequent estimations.

TABLE A.II
 ROBUSTNESS RESULTS: CORRECTING FOR SAMPLE SELECTION BIAS FOLLOWING WOOLDRIDGE (1995) AND MUNDLAK (1978)^a

<i>Dependent Variable:</i>	LN(CREDIT AMOUNT _{tbi})				I(W/O COLLATERAL _{tbi})		I(FUTURE DEFAULT _{tbi})
	(1)	(2)	(3)	(4)	(5)	(6)	(8)
					BENCHMARK TIME*BANK FE		
SECOND STEP							
<i>I</i> (FIRM RISK _{it})	-0.19** (0.09)	0.56 (0.10)	0.91 (0.11)	-5.06* (2.96)			
Δ OVERNIGHT RATE _{t-1}		-34.32**	-24.71*	-171.80*			
* <i>I</i> (FIRM RISK _{it})		(12.26)	(14.50)	(97.74)			
Δ OVERNIGHT RATE _{t-1}				54.39**	62.92*	49.01+	
* <i>I</i> (FIRM RISK _{it})				(25.02)	(35.16)	(29.95)	
*LN(BANK CAPITAL _{t-1b})							
						17.55** (7.78)	LN(BANK CAPITAL _{t-1b})
							-0.06 (0.08)
							Δ OVERNIGHT RATE _{t-1}
							*LN(BANK CAPITAL _{t-1b})
							3.32* (1.82)

(Continues)

TABLE A.II—Continued

Dependent Variable:	LN(CREDIT AMOUNT _{tbi})						I (W/O COLLATERAL _{tbi})	I (FUTURE DEFAULT _{tbi})
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					BENCHMARK	TIME*BANK FE		
(Year–Month) Fixed Effects	Yes	Yes	Yes	Yes	—	—	—	—
Firm Fixed Effects	No	No	No	Yes	—	—	—	—
Bank Fixed Effects	No	No	Yes	Yes	Yes	—	—	Yes
[(Year–Month)*Firm] Fixed Effects	No	No	No	No	Yes	Yes	Yes	Yes
[(Year–Month)*Bank] Fixed Effects	No	No	No	No	No	Yes	Yes	No
Bank Controls	Yes	Yes	Yes	Yes	Yes	—	—	Yes
{ΔGDP _{t-1} , ΔCPI _{t-1} } *I (FIRM RISK _{ti})	No	No	No	Yes	Yes	Yes	Yes	Yes
*LN(BANK CAPITAL _{t-1b}) ΔOVERNIGHT RATE _{t-1}	No	No	No	Yes	Yes	Yes	Yes	Yes
*I (FIRM RISK _{ti}) *{Bank Controls _{t-1b} }								

^aThis table reports estimates from type-2 Tobit sample selection models, which explain the committed amount of granted loans by the bank to a firm given its loan application was successful (intensive margin of new lending). The estimates come from the second stage of a two-step estimation procedure for panel data sample selection models outlined by Wooldridge (1995) and Mundlak (1978) and uses 38,334 observations from the 2002:02–2008:12 period. The dependent variables are LN(CREDIT AMOUNT_{tbi}), which following a successful application filed in month *t* to bank *b* by firm *i* is the logarithm of the committed loan amount granted by bank *b* to firm *i* in *t* to *t*+3; I(WITHOUT COLLATERAL_{tbi}), which equals 1 if the loan granted in month *t* by bank *b* by firm *i* is uncollateralized, and equals 0 otherwise; and I(FUTURE DEFAULT_{tbi}), which equals 1 when firm *i* that is granted the loan at time *t* by bank *b* defaults at some point in the future. The definition of the independent variables can be found in the Appendix (FIRM RISK is based on a 4-year credit history). Where possible, a constant is included but its coefficient is left unreported. Where possible, all macro, bank, and firm variables in triple interactions are included in levels and in double interactions but their coefficients are left unreported. Fixed effects are either included (“Yes”), not included (“No”), or spanned by another set of effects (“—”). For each variable the first row lists the coefficient, the second row lists the robust standard error that is corrected for clustering at the firm level; the corresponding significance levels are adjacent to the coefficient in the second column. ⁺The coefficient has a *p*-value that equals 10.1 percent. **p* < 0.10; ***p* < 0.05; ****p* < 0.01.

TABLE A.III
VARIOUS ROBUSTNESS^a

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	BENCHMARK: TABLE II MODEL (5)	TIME*BANK FE: TABLE II MODEL (6)	BENCHMARK+ ΔSPANISH LONG-TERM INTEREST RATE	BENCHMARK+ ΔU.S. LONG-TERM INTEREST RATE	BENCHMARK+ ΔU.S. SHORT-TERM INTEREST RATE	BENCHMARK+ ΔSPANISH ACCOUNT CURRENT DEFICIT / GDP	BENCHMARK NO CORRECTION FOR SAMPLE SELECTION: ONE- STEP
FIRST STEP							
<i>Dependent Variable:</i>							
$I(\text{GRANTING OF LOAN APPLICATIONS}_{tbi})$							
$\Delta \text{OVERNIGHT RATE}_{t-1}$	9.89**	9.73*	10.70*	10.10**	10.91**	10.04**	
* $I(\text{FIRM RISK}_{it})$	(4.72)	(5.59)	(5.64)	(4.70)	(4.59)	(4.83)	
* $\text{LN}(\text{BANK CAPITAL}_{t-1b})$							
CONTROL _{$t-1$}			-1.66	2.12	4.46*	1.95	
* $I(\text{FIRM RISK}_{it})$			(5.71)	(5.73)	(2.52)	(4.28)	
* $\text{LN}(\text{BANK CAPITAL}_{t-1b})$							
<i>For Lowly versus Highly Capitalized Bank (1 St. Dev. Difference)</i>							
- Impact of 1 pp Decrease in Overnight Rate on Granting to Risky Firms	8.4%	8.2%	9.1%	8.5%	9.2%	8.5%	
- Impact of 1 pp Decrease in Control on Granting to Risky Firms			-1.0%	1.3%	2.8%	1.2%	

(Continues)

TABLE A.III—Continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	BENCHMARK: TABLE II MODEL (5)	TIME*BANK FE: TABLE II MODEL (6)	BENCHMARK+ ΔSPANISH LONG-TERM INTEREST RATE	BENCHMARK+ ΔU.S. LONG-TERM INTEREST RATE	BENCHMARK+ ΔU.S. SHORT-TERM INTEREST RATE	BENCHMARK+ ΔSPANISH ACCOUNT CURRENT DEFICIT / GDP	BENCHMARK NO CORRECTION FOR SAMPLE SELECTION: ONE- STEP
SECOND STEP							
<i>Dependent Variable:</i>							
LN(CREDIT AMOUNT _t ^{lbi})							
ΔOVERNIGHT RATE _{t-1}	58.94**	53.49+	78.35**	61.49**	86.76***	81.69***	43.87**
*I(FIRM RISK _{it})	(24.96)	(32.62)	(31.05)	(27.17)	(30.38)	(28.64)	(22.43)
*LN(BANK CAPITAL _{t-1b})							
CONTROL _{t-1}			-50.00	14.38	44.54**	-63.40**	
*I(FIRM RISK _{it})			(44.27)	(36.26)	(21.79)	(30.97)	
*LN(BANK CAPITAL _{t-1b})							
<i>For Lowly versus Highly Capitalized Bank (1 St. Dev. Difference)</i>							
- Impact of 1 pp Decrease in Overnight Rate on Credit to Risky Firms	17.8%	16.1%	23.6%	18.5%	26.2%	24.6%	13.2%
- Impact of 1 pp Decrease in Control on Credit to Risky Firms			-15.1%	4.3%	13.4%	-19.1%	

(Continues)

TABLE A.III—Continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	BENCHMARK: TABLE II MODEL (5)	TIME*BANK FE: TABLE II MODEL (6)	BENCHMARK+ ΔSPANISH LONG-TERM INTEREST RATE	BENCHMARK+ ΔU.S. LONG-TERM INTEREST RATE	BENCHMARK+ ΔU.S. SHORT-TERM INTEREST RATE	BENCHMARK+ ΔSPANISH ACCOUNT CURRENT DEFICIT / GDP	BENCHMARK NO CORRECTION FOR SAMPLE SELECTION: ONE- STEP
[(Year-Month)*Firm] Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
[(Year-Month)*Bank] Fixed Effects	No	Yes	No	No	No	No	No
Bank Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
{ΔGDP _{t-1} , ΔCPI _{t-1} }	Yes	Yes	Yes	Yes	Yes	Yes	Yes
*I (FIRM RISK _{it})							
*LN(BANK CAPITAL _{t-1b})							
ΔOVERNIGHT RATE _{t-1}	Yes	Yes	Yes	Yes	Yes	Yes	Yes
*I (FIRM RISK _{it})							
*{Bank Controls _{t-1b} }							

^aThis table reports estimates from type-2 Tobit sample selection models which explain the probability that a loan application is approved by a bank and the loan is granted to a firm that is new to the bank (extensive margin of new lending) and the committed amount of granted loans by the bank to a firm given its loan application was successful (intensive margin of new lending). The estimates of the first step in this table come from linear probability models using ordinary least squares and 241,052 observations from the 2002:02–2008:12 period. The estimates of the second step come from the second stage of a two-step estimation procedure for panel data sample selection models outlined by Kyriazidou (1997) using kernel least squares. It uses 38,334 observations. The estimates in model (7) come from a one-step ordinary least squares regression. The dependent variables are $I(\text{GRANTING OF LOAN APPLICATIONS}_{tbi})$ which equals one if the loan application made in month t to bank b by firm i is successful and the loan is granted in t to $t+3$, and equals zero otherwise; and $\text{LN}(\text{CREDIT AMOUNT}_{tbi})$ which following a successful application filed in month t to bank b by firm i is the logarithm of the committed loan amount granted in t to $t+3$ by bank b to firm i . The definition of the independent variables can be found in the Appendix (FIRM RISK is based on a 4-year credit history). Where possible a constant is included but its coefficient is left unreported. Where possible all macro, bank and firm variables in triple interactions are included in levels and in double interactions but their coefficients are left unreported. Fixed effects are either included (“Yes”), not included (“No”) or spanned by another set of effects (“—”). For each variable the first row lists the coefficient, the second row lists the robust standard error that is corrected for multi-clustering at the year-month, bank and firm level; the corresponding significance levels are adjacent to the coefficient in the second column. The single-stage/total impact is calculated as the percent change in the mean granting probability or/times the credit amount following a one percentage point decrease in the overnight interest rate or control variable and lending to firms with doubtful loans in the previous four years by a lowly versus highly capitalized bank that differ by one standard deviation in capitalization. ⁺The coefficient has a p -value that equals 10.1 percent. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

TABLE A.IV
ROBUSTNESS OF OVERNIGHT RATE * FIRM RISK^a

	(1)	(2)
	Banks With Capital Ratio in Lowest 25%: 52% of Observations	Banks With Capital Ratio in Highest 75%: 48% of Observations
FIRST STEP		
<i>Dependent Variable: I(GRANTING OF LOAN APPLICATIONS_{tbi})</i>		
<i>I(FIRM RISK_{ti})</i>	-0.00 (0.12)	-0.00 (0.12)
Δ OVERNIGHT RATE _{t-1} * <i>I(FIRM RISK_{ti})</i>	3.74 (2.82)	3.44 (3.01)
SECOND STEP		
<i>Dependent Variable: LN(CREDIT AMOUNT_{tbi})</i>		
<i>I(FIRM RISK_{ti})</i>	-11.11** (4.62)	-35.22*** (11.17)
Δ OVERNIGHT RATE _{t-1} * <i>I(FIRM RISK_{ti})</i>	-557.32*** (188.97)	-483.53** (244.37)
(Year-Month) Fixed Effects	Yes	Yes
Firm Fixed Effects	Yes	Yes
Bank Fixed Effects	No	No
Bank Controls	Yes	Yes

^aThis table reports estimates from type-2 Tobit sample selection models which explain the probability that a loan application is approved by a bank and the loan is granted to a firm that is new to the bank (extensive margin of new lending) and the committed amount of granted loans by the bank to a firm given its loan application was successful (intensive margin of new lending). The estimates of the first step in this table come from linear probability models using ordinary least squares and 241,052 observations from the 2002:02–2008:12 period. The estimates of the second step come from the second stage of a two-step estimation procedure for panel data sample selection models outlined by Kyriazidou (1997) using kernel least squares. The second step uses 38,334 observations (which in models (2) and (3) are split as indicated). The dependent variables are *I(GRANTING OF LOAN APPLICATIONS_{tbi})*, which equals 1 if the loan application made in month *t* to bank *b* by firm *i* is successful and the loan is granted in *t* to *t* + 3, and equals 0 otherwise; and *LN(CREDIT AMOUNT_{tbi})*, which following a successful application filed in month *t* to bank *b* by firm *i* is the logarithm of the committed loan amount granted by bank *b* to firm *i* in *t* to *t* + 3. The definition of the independent variables can be found in the Appendix (FIRM RISK is based on a 4-year credit history). Where possible a constant is included but its coefficient is left unreported. Where possible all macro in double interactions are included in levels but their coefficients are left unreported. Fixed effects are either included (“Yes”), not included (“No”) or spanned by another set of effects (“—”). For each variable the first row lists the coefficient, the second row lists the robust standard error that is corrected for multi-clustering at the year-month, bank and firm level; the corresponding significance levels are adjacent to the coefficient in the second column. * *p* < 0.10; ** *p* < 0.05; *** *p* < 0.01.

TABLE A.V
 QUARTERLY CHANGE IN THE COMMITTED AMOUNT OF GRANTED LOANS BY A BANK TO A FIRM

	(1)	(2)	(3)	(4)
<i>Dependent Variable: $\Delta \text{LN}(\text{CREDIT AMOUNT}_{tbi})$</i>				
$\Delta \text{LN}(\text{CREDIT AMOUNT}_{t-1bi})$		-0.29*** (0.00)	-0.29*** (0.00)	-0.29*** (0.00)
$\Delta \text{OVERNIGHT RATE}_{t-1} * I(\text{FIRM RISK}_{ti}) * \text{LN}(\text{BANK CAPITAL}_{t-1b})$	0.35** (0.16)	0.37** (0.18)	0.35* (0.18)	0.37* (0.20)
[(Year-Quarter)*Firm] Fixed Effects	Yes	Yes	Yes	Yes
[(Year-Quarter)*Bank] Fixed Effects	Yes	Yes	Yes	Yes
Bank*Firm Fixed Effects	Yes	Yes	Yes	Yes
$\{\Delta \text{GDP}_{t-1}, \Delta \text{CPI}_{t-1}\} * I(\text{FIRM RISK}_{ti}) * \text{LN}(\text{BANK CAPITAL}_{t-1b})$	No	No	Yes	Yes
$\Delta \text{OVERNIGHT RATE}_{t-1} * I(\text{FIRM RISK}_{ti}) * \{\text{Bank Controls}_{t-1b}\}$	No	No	No	Yes

^aThis table reports estimates from linear models that explain the change in the outstanding amount of lending by a bank to a firm (intensive margin of lending) with firm credit history, monetary conditions and bank risk. The estimates come from linear models using ordinary least squares and 6,564,964 observations from the 1988:II–2008:IV period. The dependent variable is $\Delta \text{LN}(\text{CREDIT AMOUNT}_{tbi})$ which is the change in the logarithm of the committed amount of granted loans during quarter t by bank b to firm i . The definition of the independent variables can be found in the Appendix (FIRM RISK is based on a 4-year credit history). Where possible a constant is included but its coefficient is left unreported. Where possible all macro, bank and firm variables in triple interactions are included in levels and in double interactions but their coefficients are left unreported. Fixed effects are either included (“Yes”) or not included (“No”). For each variable the first row lists the coefficient, the second row lists the robust standard error that is corrected for clustering at the firm level; the corresponding significance levels are adjacent to the coefficient in the second column. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

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