

Tables for “Collateral versus Bank Lending Channel: Evidence from a massive earthquake”

Table 1: Overall damage of the Great East Japan (Tohoku) earthquake

<hr/> Numbers of <hr/>	
deaths	19575
people missing	2577
injured	6230
houses totally destroyed	121776
houses half destroyed	280326
houses partially destroyed	744269
damaged non-residential buildings	106587

Report on the Great East Japan Earthquake issued by the Fire Department on September 8, 2017.

Table 2: Definition of variables

Variables	Definition	Winsorized
Credit constraint variables		
Constrained1	1: a firm does not procure either sufficient or necessary amount of funds, 0: it procures sufficient amount of funds	No
Constrained2	3: a firm neither obtains new loans nor procures necessary amount of funds, 2: it obtains new loans but does not procure sufficient amount of funds, 1: it obtains new loans and procures sufficient amount of funds	No
Firm activity variables		
Activity_Level	Level of a firm's activities in a year relative to the level in the previous year before the Tohoku Earthquake. 100% if it is the same as in the pre-earthquake year.	Yes
Investment	Amount of tangible investment (including land and structures) in a year/amount of tangible assets outstanding at the end of the previous year	Yes
Loan_Ratio	Amount of loans outstanding / amount of total assets outstanding at the end of year	Yes
Variables on damage		
F_Damage_Tangibles	Amount of damage on a firm's non-land tangible assets / total amount of the firm's assets before the earthquake. The damage is measured by the replacement costs.	Yes
F_Damage_Land	Amount of damage on a firm's land assets / total amount of the firm's assets before the earthquake. The damage is measured by the loss in the appraisal value of land.	Yes
B_Special_Loss	Special loss for a firm's primary bank in the fiscal year of 2010/ total asset amount of the bank at the end of the fiscal year. Primary bank is the one that extends the largest amount of loans to the firm.	No
dB_CapRatio_Basel	Change in the capital ratio of a firm's primary bank from fiscal year 2009 to 2010. For the ratio, the amount of capital is divided by the risk-asset amount.	No
dB_CapRatio	Change in the capital ratio of a firm's primary bank from fiscal year 2009 to 2010. For the ratio, the amount of capital is divided by the total asset amount in the balance sheet.	No
B_Branch_Reloc	1: the branch of the primary bank that a firm used to transact with before the earthquake has been relocated, and 0: otherwise	No
B_Branch_Reloc_sum	Number of relocated branches of the primary bank / total number of branches of the bank	No
B_Branch_Closed	1: the branch of the primary bank that a firm used to transact with before the earthquake has been closed at least one day, and 0: otherwise	No
B_Branch_Closed_sum	Number of closed branches of the primary bank / total number of branches of the bank	No
B_Branch_Closed_Duration	Number of days the branch of the primary bank a firm used to transact with has been closed	No
B_Branch_Closed_Long_sum	Number of branches of the primary bank that have been closed for no less than 60 days / total number of branches of the bank	No
Cus_Damage	1: a firm is indirectly affected by the damage on its customers, and 0: otherwise	No
Sup_Damage	1: a firm is indirectly affected by the damage on its suppliers, and 0: otherwise	No
Damaged_Area	1: a firm is located in an area designated by the Act concerning Special Financial Support to Deal with the Designated Disaster of Extreme Severity, and 0: otherwise	No
Tsunami_Area	1: a firm is located in an area inundated by the tsunami, and 0: otherwise	No
Evacuation_Area	1: a firm is located in an area within a 20km diameter from the Fukushima Dai-ichi Nuclear Power Plant, and 0: otherwise	No

Table 2 (continued)

Variables	Definition	Winsorized
Variables on financial support		
Injection	1: the primary bank for a firm receives capital injection by the government after the earthquake, and 0: otherwise	No
Insurance	1: a firm had purchased insurance policies for earthquakes, and 0: otherwise	No
Subsidy	1: a firm receives subsidies for recovery from the government, and 0: otherwise	No
Num_bank	Number of banks a firm used to transact with before the earthquake	No
Duration_bank	Number of transaction years with the primary bank	No
Control variables		
Employment	Number of employees for a firm	No
Business_Condition	Current business conditions for a firm. 1: very good, 2: good, 3: fair, 4: bad, and 5: very bad	No
Leverage	Amount of liabilities in the previous year / amount of total assets in the previous year	Yes
Industry dummies	2: Construction (default), 3: Manufacturing, 4: Utilities, IT, and Transportation, 7: Wholesale, 8: Retail sales, and 9: Services and other industries	No

Table 3 Summary statistics

	N	mean	sd	min	p25	p50	p75	max
Credit constraint variables								
Constrained1	1190	0.4933	0.5002	0	0	0	1	1
Constrained2	1122	1.5036	0.5749	1	1	1	2	3
Firm activity variables								
Activity_Level	958	93.4438	30.1284	0	80	96	100	300
Investment	504	0.2509	0.4807	0	0.0179	0.0686	0.2719	4.5320
Loan_Ratio	995	0.5978	0.7004	0	0.2336	0.4603	0.7018	5
Damage variables								
F_Damage_Tangibles	1190	0.1541	0.3932	0	0	0.0188	0.1133	3.2787
F_Damage_Land	1190	0.0198	0.0841	0	0	0	0	0.6093
B_Special_Loss	1190	0.0037	0.0033	0.0000	0.0008	0.0027	0.0083	0.0090
dB_CapRatio_Basel	1176	-0.0054	0.0102	-0.0291	-0.0160	-0.0040	-0.0002	0.0671
dB_CapRatio	1188	-0.0052	0.0047	-0.0117	-0.0111	-0.0033	-0.0021	0.0138
B_Branch_Closed	1190	0.3387	0.4735	0	0	0	1	1
B_Branch_Closed_sum	1190	0.2330	0.2228	0	0.0734	0.2027	0.3451	1
B_Branch_Reloc	1190	0.1420	0.3492	0	0	0	0	1
B_Branch_Reloc_sum	1190	0.1021	0.1248	0	0.0690	0.0789	0.1197	0.6667
Cus_Damage	1190	0.4782	0.4997	0	0	0	1	1
Sup_Damage	1190	0.3782	0.4851	0	0	0	1	1
Damaged_Area	1190	0.8319	0.3741	0	1	1	1	1
Tsunami_Area	1190	0.2059	0.4045	0	0	0	0	1
Evacuation_Area	1190	0.0118	0.1079	0	0	0	0	1
Financial support variables								
Injection	1190	0.3924	0.4885	0	0	0	1	1
Insurance	1190	0.2815	0.4499	0	0	0	1	1
Subsidy	1190	0.2370	0.4254	0	0	0	0	1
Num_bank	1088	2.5983	1.8493	0	1	2	3	19
Duration_bank	1067	30.9428	15.9727	0	20	30	40	100
Control variables								
Employment	1190	33.6370	71.8974	1	8	18	35	1637
Business_Condition	1190	3.2101	1.0709	1	2	3	4	5
Leverage	1190	0.8647	0.6623	0.0002	0.5749	0.7979	0.9657	6.5
Ind3=2(Construction)	1190	0.3025	0.4593	0	0	0	1	1
=3(Manufacturing)	1190	0.1714	0.3769	0	0	0	0	1
=4(Utilities, IT, and Transpor	1190	0.0840	0.2774	0	0	0	0	1
=7(Wholesale)	1190	0.1437	0.3508	0	0	0	0	1
=8(Retail)	1190	0.1294	0.3357	0	0	0	0	1
=9(Services)	1190	0.1689	0.3747	0	0	0	0	1

Table 4 Damage to banks

Bank name	Category of banks	bankcode	B_Special_Loss	dB_CapRatio_Base	dB_Capratio	B_Branch_Closed_sum	B_Branch_Closed_Long_sum	B_Branch_Reloc_sum	Injection
Fukushima 77	2nd-tier regional	513	0.00900	-0.014	-0.0110	0.2364	0	0.0727	0
Tohoku	regional	125	0.00825	-0.016	-0.0111	0.3451	0.0282	0.1197	1
Kitanohon	regional	124	0.00695	-0.0106	-0.0082	0.1379	0	0.0690	1
Ishinomaki	2nd-tier regional	509	0.00538	-0.006	-0.0064	0.1235	0	0.0864	0
Sendai	shinkin	1172	0.00412	-0.0077	-0.0071	1	0	0.6667	1
Iwate	2nd-tier regional	512	0.00411	-0.0185	-0.0112	0.1690	0.0282	0.1268	1
Daito	regional	123	0.00273	-0.0002	-0.0033	0.0734	0.0734	0.0734	0
Iwaki	2nd-tier regional	514	0.00264	0.0031	-0.0023	0.1111	0	0.0794	0
Sen-nan	credit cooperative	2092	0.00199	-0.002	-0.0029	0.6842	0	0.2632	1
Kesenuma	shinkin	1174	0.00168	0.0005	0.0001	0.0625	0	0.0625	0
Morinomiyako	shinkin	1175	0.00167	-0.0291	-0.0117	0.9167	0	0.6667	1
Soso	shinkin	1170	0.00163	0.0025	0.0011	0.2667	0	0.2667	0
Ishinomaki shoko	credit cooperative	2095	0.00150	-0.0065	-0.0017	0.8750	0.5000	0.5000	1
Miyako	credit cooperative	2061	0.00147	0.0134	-0.0002	0.2500	0.1667	0.1667	0
Aizu shoko	shinkin	1152	0.00144	-0.004	-0.0017	0.7778	0.2222	0.6667	1
Sukagawa	credit cooperative	2096	0.00109	0.0016	-0.0006	0	0	0	0
Kirayaka	shinkin	1185	0.00108	-0.0008	-0.0016	0.0769	0	0.0769	0
Himawari	2nd-tier regional	508	0.00098	-0.0104	-0.0022	0.0339	0	0.0254	1
Asuka	shinkin	1186	0.00096	-0.0001	-0.0005	1	0.0625	0.0625	0
Toho	credit cooperative	2060	0.00096	0.0009	-0.0015				0
Aomori	regional	126	0.00075	-0.0004	-0.0021	0.3070	0.0526	0.0789	0
Ichinoseki	shinkin	1105	0.00072	0.0113	-0.0004	0.0137	0	0	0
Development bank of Jap	shinkin	1153	0.00067	0.0076	-0.0001	0	0	0	0
Miyagi Dai-ichi	government-affiliated	9930	0.00063	0.0142	0.0138	0	0	0	0
Aomori	shinkin	1171	0.00055	0.0024	0.0026	0.0769	0	0	0
Nihonmatsu	regional	117	0.00040	-0.0097	-0.0017	0	0	0	0
Japan Finance Corporation	shinkin	1189	0.00037	0.0014	-0.0001	0	0	0	0
Fukushimaken Shoko	government-affiliated	9932	0.00037		-0.0091				0
Ashikaga	credit cooperative	2090	0.00028		-0.0011	0.0625	0	0	0
Yamanashi Chuo	shinkin	1190	0.00025	0.0028	-0.0022	0.0385	0	0	0
Akita	regional	129	0.00024			0	0	0	0
Senhoku	regional	142	0.00024	0.0076	-0.0016	0	0	0	0
Joyo	regional	119	0.00022	-0.0013	-0.0030	0	0	0	0
Mitsubishi-Tokyo-UFJ	credit cooperative	2063	0.00021	-0.0071	-0.0045	0	0	0	0
Michinoku	regional	130	0.00019	-0.0001	-0.0007	0.0400	0	0.0057	0
Risona	city	5	0.00018	0.0027	-0.0009	0	0	0	0
Norinchukin	regional	118	0.00017	-0.0103	-0.0018	0	0	0	0
Shonai	city	10	0.00015	0.0074	-0.0002	0	0	0	0
Daishi	agricultural	3000	0.00014	0.0671	0.0051	0	0	0	0
Shokochukin	regional	121	0.00012	0.0257	-0.0025	0.1059	0.0118	0.0471	0
Morioka	regional	140	0.00011	-0.0084	-0.0022	0	0	0	0
Yamagata	government-affiliated	2004	0.00011	0.0097	0.0007	0	0	0	0
Mitsui-Sumitomo	shinkin	1150	0.00010	-0.0051	-0.0042	0	0	0	0
Mizuho	regional	122	0.00008	0.0049	-0.0008	0.0500	0	0	0
Tokyo Tomin	city	9	0.00008	0.0317	-0.0040	0	0	0	0
Koriyama	city	1	0.00007	0.0266	0.0073	0	0	0	0
Shirakawa	regional	137	0.00007	-0.0053	-0.0019	0	0	0	0
Mizuho Corporate	shinkin	1182	0.00007	0.0077	0.0005	0.0526	0.0526	0.0526	0
Mizusawa	shinkin	1184	0.00006	-0.0036	-0.0075	0	0	0	0
Kitakami	shinkin	16	0.00005	0.0205	0.0056	0	0	0	0
Aizu	shinkin	1156	0.00004	0.0073	0.0063	0	0	0	0
Yokohama	shinkin	1154	0.00004	0.0001	-0.0009	0	0	0	0
Aomori-ken	shinkin	1181	0.00003	0.0077	-0.0006	0	0	0	0
Hanamaki	regional	138	0.00003	0.0006	-0.0010	0	0	0	0
Kanagawa	credit cooperative	2030	0.00001		-0.0002	0	0	0	0
Abukuma	shinkin	1155	0.00001	0.0093	-0.0007	0	0	0	0
Furukawa	2nd-tier regional	530	0.00001	0.0038	-0.0014	0	0	0	0
	shinkin	1188	0.00001	0.0018	-0.0023	0.4286	0.4286	0.2143	1
	credit cooperative	2062	0.00000		-0.0035	0	0	0	0

Table 5 Credit constraint estimation (a) Baseline

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable=Constrained1					
	Probit model estimation					
F_Damage_Tangibles	0.467*** (0.128)		0.450*** (0.127)	0.459*** (0.127)	0.479*** (0.126)	0.450*** (0.124)
F_Damage_Land		0.992* (0.509)				
B_Special_Loss	37.91*** (12.04)	38.47*** (11.99)			40.18*** (12.22)	38.58*** (11.95)
dB_CapRatio_Basel			-12.35*** (4.077)			
dB_CapRatio				-23.83*** (8.593)		
B_Branch_Reloc	-0.0883 (0.123)	-0.0361 (0.121)	-0.0710 (0.123)	-0.0729 (0.123)		
B_Branch_Reloc_sum	0.211 (0.336)	0.318 (0.332)	0.102 (0.344)	0.133 (0.342)		
B_Branch_Closed					-0.0554 (0.0943)	
B_Branch_Closed_sum					-0.0917 (0.193)	
B_Branch_Closed_Duration						0.000538 (0.000361)
B_Branch_Closed_Long_sum						0.306 (0.694)
Cus_Damage	-0.0952 (0.0838)	-0.0872 (0.0835)	-0.0786 (0.0844)	-0.0887 (0.0839)	-0.0969 (0.0839)	-0.0993 (0.0839)
Sup_Damage	0.0790 (0.0832)	0.0698 (0.0829)	0.0807 (0.0836)	0.0775 (0.0832)	0.0738 (0.0831)	0.0774 (0.0831)
Damaged_Area	0.0605 (0.106)	0.0812 (0.106)	0.0552 (0.107)	0.0582 (0.106)	0.0743 (0.107)	0.0584 (0.106)
Tsunami_Area	0.151 (0.104)	0.194* (0.103)	0.176* (0.105)	0.158 (0.104)	0.166 (0.104)	0.135 (0.101)
Evacuation_Area	-0.0210 (0.363)	-0.159 (0.368)	-0.0243 (0.363)	-0.0364 (0.363)	-0.0152 (0.362)	-0.668 (0.560)
Employment	-0.00372*** (0.000956)	-0.00381*** (0.000958)	-0.00349*** (0.000943)	-0.00361*** (0.000950)	-0.00379*** (0.000965)	-0.00364*** (0.000949)
Business_Condition	0.280*** (0.0378)	0.284*** (0.0377)	0.282*** (0.0381)	0.278*** (0.0378)	0.277*** (0.0377)	0.278*** (0.0378)
Leverage	0.281*** (0.0636)	0.299*** (0.0634)	0.274*** (0.0634)	0.279*** (0.0635)	0.285*** (0.0635)	0.285*** (0.0636)
Manufacturing	0.103 (0.119)	0.117 (0.119)	0.117 (0.120)	0.0973 (0.119)	0.0963 (0.120)	0.0986 (0.120)
Utilities, IT, and Transportati	-0.0789 (0.154)	-0.0704 (0.153)	-0.108 (0.156)	-0.0866 (0.154)	-0.0905 (0.154)	-0.0898 (0.154)
Wholesale	-0.217* (0.129)	-0.224* (0.128)	-0.212 (0.129)	-0.216* (0.129)	-0.226* (0.128)	-0.218* (0.129)
Retail	-0.207 (0.129)	-0.194 (0.128)	-0.224* (0.130)	-0.215* (0.129)	-0.207 (0.129)	-0.199 (0.129)
Services	-0.0245 (0.118)	-0.0210 (0.117)	-0.0313 (0.119)	-0.0381 (0.118)	-0.0286 (0.118)	-0.0161 (0.118)
Constant	-1.269*** (0.182)	-1.298*** (0.182)	-1.201*** (0.179)	-1.239*** (0.181)	-1.232*** (0.182)	-1.268*** (0.184)
Number of observations	1,190	1,190	1,176	1,188	1,190	1,190

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5 Credit constraint estimation (b) *Constrained2* employed as a dependent variable

VARIABLES	(7)	(8)	(9)	(10)	(11)	(12)
	Dependent variable = <i>Constrained2</i>					
	Ordered probit model estimation					
F_Damage_Tangibles	0.390*** (0.0986)		0.379*** (0.0985)	0.387*** (0.0985)	0.394*** (0.0977)	0.376*** (0.0971)
F_Damage_Land		0.675 (0.477)				
B_Special_Loss	40.65*** (11.53)	41.87*** (11.51)			43.40*** (11.77)	40.44*** (11.50)
dB_CapRatio_Basel			-13.70*** (4.022)			
dB_CapRatio				-25.11*** (8.269)		
B_Branch_Reloc	-0.132 (0.117)	-0.0801 (0.116)	-0.117 (0.116)	-0.117 (0.117)		
B_Branch_Reloc_sum	0.284 (0.318)	0.347 (0.317)	0.148 (0.324)	0.198 (0.323)		
B_Branch_Closed					-0.0629 (0.0904)	
B_Branch_Closed_sum					-0.122 (0.187)	
B_Branch_Closed_Duration						0.000271 (0.000326)
B_Branch_Closed_Long_sum						0.0294 (0.674)
Cus_Damage	-0.122 (0.0811)	-0.102 (0.0807)	-0.111 (0.0815)	-0.116 (0.0811)	-0.121 (0.0811)	-0.120 (0.0810)
Sup_Damage	0.0421 (0.0804)	0.0290 (0.0802)	0.0417 (0.0808)	0.0397 (0.0804)	0.0313 (0.0803)	0.0350 (0.0802)
Damaged_Area	0.00132 (0.103)	0.0256 (0.103)	-0.00688 (0.104)	-0.00225 (0.103)	0.0181 (0.104)	-0.00165 (0.103)
Tsunami_Area	0.153 (0.0986)	0.184* (0.0984)	0.181* (0.0990)	0.163* (0.0986)	0.166* (0.0979)	0.135 (0.0952)
Evacuation_Area	0.0475 (0.351)	-0.0334 (0.354)	0.0471 (0.351)	0.0343 (0.351)	0.0406 (0.351)	-0.337 (0.546)
Employment	-0.00374*** (0.000956)	-0.00384*** (0.000959)	-0.00348*** (0.000940)	-0.00364*** (0.000950)	-0.00384*** (0.000966)	-0.00369*** (0.000950)
Business_Condition	0.292*** (0.0369)	0.294*** (0.0368)	0.294*** (0.0372)	0.290*** (0.0369)	0.287*** (0.0368)	0.287*** (0.0368)
Leverage	0.233*** (0.0548)	0.249*** (0.0544)	0.227*** (0.0548)	0.230*** (0.0548)	0.238*** (0.0548)	0.236*** (0.0547)
Manufacturing	0.0891 (0.113)	0.0928 (0.113)	0.102 (0.113)	0.0862 (0.113)	0.0807 (0.113)	0.0811 (0.113)
Utilities, IT, and Transportatic	-0.110 (0.151)	-0.108 (0.150)	-0.116 (0.153)	-0.115 (0.151)	-0.121 (0.150)	-0.117 (0.150)
Wholesale	-0.191 (0.124)	-0.199 (0.124)	-0.186 (0.125)	-0.189 (0.125)	-0.201 (0.124)	-0.197 (0.124)
Retail	-0.239* (0.127)	-0.227* (0.126)	-0.252** (0.127)	-0.244* (0.127)	-0.235* (0.127)	-0.234* (0.127)
Services	-0.0450 (0.114)	-0.0514 (0.114)	-0.0534 (0.115)	-0.0545 (0.114)	-0.0479 (0.114)	-0.0392 (0.114)
Constant cut1	1.252*** (0.173)	1.274*** (0.173)	1.174*** (0.171)	1.217*** (0.172)	1.200*** (0.173)	1.224*** (0.175)
Constant cut2	3.101*** (0.195)	3.103*** (0.194)	3.021*** (0.192)	3.062*** (0.193)	3.050*** (0.194)	3.072*** (0.196)
Number of observations	1,122	1,122	1,110	1,120	1,122	1,122

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5 Credit constraint estimation (c) Different periods

VARIABLES	period=	(13)	(14)	(15)	(16)
		2	3	4	5
Dependent variable = Constrained1					
Probit model estimation					
		~July 2012	~Aug/Sep 2013	~Aug/Sep 2014	~Oct/Nov 2015
F_Damage_Tangibles		0.467*** (0.128)	0.0877 (0.109)	-0.0613 (0.131)	0.0928 (0.177)
B_Special_Loss		37.91*** (12.04)	30.75** (13.29)	7.373 (19.36)	-21.64 (21.77)
B_Branch_Reloc		-0.0883 (0.123)	-0.0892 (0.159)	-0.260 (0.213)	-0.146 (0.250)
B_Branch_Reloc_sum		0.211 (0.336)	0.103 (0.473)	-0.0792 (0.612)	0.619 (0.934)
Cus_Damage		-0.0952 (0.0838)	-0.207** (0.0924)	-0.0650 (0.132)	0.0140 (0.144)
Sup_Damage		0.0790 (0.0832)	0.120 (0.0917)	-0.0510 (0.129)	-0.0289 (0.139)
Damaged_Area		0.0605 (0.106)	-0.0894 (0.0986)	-0.0921 (0.144)	0.183 (0.151)
Tsunami_Area		0.151 (0.104)	0.0572 (0.141)	0.00790 (0.194)	0.0841 (0.209)
Evacuation_Area		-0.0210 (0.363)	0.379 (0.601)		
Employment		-0.00372*** (0.000956)	-0.00355*** (0.00101)	-0.0103*** (0.00212)	-0.00667*** (0.00193)
Business_Condition		0.280*** (0.0378)	0.315*** (0.0418)	0.398*** (0.0674)	0.344*** (0.0761)
Leverage		0.281*** (0.0636)	0.0869 (0.0551)	0.447*** (0.121)	0.284** (0.111)
Manufacturing		0.103 (0.119)	-0.0749 (0.133)	0.182 (0.201)	0.122 (0.205)
Utilities, IT, and Transportation		-0.0789 (0.154)	0.0450 (0.186)	0.260 (0.254)	0.371 (0.287)
Wholesale		-0.217* (0.129)	-0.361** (0.145)	-0.0252 (0.199)	-0.193 (0.222)
Retail		-0.207 (0.129)	0.0346 (0.141)	0.0230 (0.219)	0.0459 (0.228)
Services		-0.0245 (0.118)	0.0631 (0.131)	-0.129 (0.188)	-0.103 (0.196)
Constant		-1.269*** (0.182)	-0.974*** (0.170)	-1.341*** (0.270)	-1.361*** (0.295)
Number of observations		1,190	953	506	427

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5 Credit constraint estimation (d) Effects of financial support

	(17)	(18)	(19)	(20)	(21)
Dependent variable = Constrained1					
VARIABLES	Probit model estimation				
F_Damage_Tangibles	0.470*** (0.128)	0.401*** (0.141)	0.883*** (0.277)	0.952*** (0.290)	0.240 (0.294)
B_Special_Loss	50.63** (23.81)	39.88*** (12.11)	38.00*** (12.07)	42.97*** (12.56)	43.92*** (12.65)
B_Branch_Reloc	-0.0894 (0.123)	-0.0720 (0.124)	-0.0699 (0.126)	-0.0817 (0.129)	-0.0539 (0.130)
B_Branch_Reloc_sum	-0.0135 (0.424)	0.209 (0.339)	0.199 (0.338)	0.301 (0.356)	0.199 (0.352)
Cus_Damage	-0.0937 (0.0840)	-0.0925 (0.0844)	-0.0977 (0.0842)	-0.0473 (0.0883)	-0.0264 (0.0892)
Sup_Damage	0.0823 (0.0833)	0.0832 (0.0834)	0.0916 (0.0836)	0.114 (0.0874)	0.0888 (0.0885)
Damaged_Area	0.0612 (0.108)	0.0594 (0.106)	0.0598 (0.107)	0.0464 (0.110)	0.0376 (0.112)
Tsunami_Area	0.155 (0.105)	0.151 (0.105)	0.152 (0.107)	0.170 (0.111)	0.157 (0.111)
Evacuation_Area	-0.0633 (0.365)	0.00245 (0.364)	-0.0389 (0.367)	-0.124 (0.390)	-0.0725 (0.401)
Employment	-0.00372*** (0.000957)	-0.00370*** (0.000958)	-0.00358*** (0.000949)	-0.00367*** (0.00102)	-0.00367*** (0.00103)
Business_Condition	0.280*** (0.0379)	0.275*** (0.0379)	0.284*** (0.0379)	0.269*** (0.0397)	0.262*** (0.0399)
Leverage	0.277*** (0.0638)	0.283*** (0.0636)	0.280*** (0.0638)	0.252*** (0.0655)	0.223*** (0.0650)
Manufacturing	0.104 (0.119)	0.0877 (0.120)	0.117 (0.120)	0.0988 (0.123)	0.0839 (0.124)
Utilities, IT, and Transportation	-0.0743 (0.154)	-0.0889 (0.154)	-0.0682 (0.154)	-0.0431 (0.166)	-0.0646 (0.171)
Wholesale	-0.212* (0.129)	-0.234* (0.129)	-0.211 (0.129)	-0.217 (0.133)	-0.283** (0.136)
Retail	-0.209 (0.129)	-0.206 (0.129)	-0.213 (0.130)	-0.238* (0.137)	-0.296** (0.139)
Services	-0.0280 (0.118)	-0.0463 (0.118)	-0.0292 (0.118)	0.00897 (0.122)	-0.0390 (0.123)
Injection	0.224 (0.240)				
B_Special_Loss*Injection	-38.02 (38.84)				
Insurance		-0.215** (0.0958)			
F_Damage_Tangibles*Insurance		0.283 (0.304)			
Subsidy			-0.0470 (0.111)		
F_Damage_Tangibles*Subsidy			-0.520* (0.310)		
Num_B				0.0266 (0.0238)	
F_Damage_Tangibles*Num_Banks				-0.216* (0.112)	
Duration_B					-0.00426 (0.00284)
F_Damage_Tangibles*Duration_B					0.00740 (0.00899)
Constant	-1.283*** (0.184)	-1.203*** (0.185)	-1.295*** (0.183)	-1.353*** (0.200)	-1.059*** (0.213)
Number of observations	1,190	1,190	1,190	1,088	1,067

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 6 Firm activity estimation (a) Activity level

	(1)	(2)	(3)	(4)
Dependent variable:	Activity_Level	Constrained1	Activity_Level	Activity_Level
Estimation method:	Treatment regression		OLS	OLS
	Second stage	First stage		
Constrained1	-27.74*** (8.464)		-3.087 (1.892)	-3.540* (1.831)
F_Damage_Tangibles	-5.167** (2.506)	0.383*** (0.114)	-7.562*** (2.109)	
B_Special_Loss		37.28*** (12.07)		
Cus_Damage	-2.717 (2.066)	0.0223 (0.0889)	-2.717 (1.947)	-3.251* (1.948)
Sup_Damage	-0.656 (2.041)	-0.00370 (0.0885)	-0.202 (1.931)	0.184 (1.942)
Damaged_Area	0.0364 (2.589)	0.0439 (0.110)	-0.718 (2.444)	-1.241 (2.296)
Tsunami_Area	-2.673 (2.538)	0.135 (0.106)	-5.085** (2.310)	-6.633*** (2.302)
Evacuation_Area	-17.04* (9.252)	-0.139 (0.424)	-14.97* (8.782)	-14.55 (9.040)
Employment	-0.00709 (0.0144)	-0.00353*** (0.000976)	0.0121 (0.0123)	0.0109 (0.0125)
Business_Condition	-4.946*** (1.219)	0.262*** (0.0395)	-7.501*** (0.869)	-7.742*** (0.856)
Leverage	3.285** (1.595)	0.273*** (0.0654)	0.639 (1.328)	-0.0378 (1.214)
Manufacturing	-9.320*** (3.015)	0.115 (0.130)	-10.21*** (2.852)	-8.989*** (2.762)
Utilities, IT, and Transportation	-8.314** (3.861)	0.0291 (0.168)	-8.044** (3.673)	-6.610* (3.630)
Wholesale	-12.07*** (3.295)	-0.271** (0.137)	-10.29*** (3.023)	-9.042*** (2.964)
Retail	-10.44*** (3.246)	-0.121 (0.138)	-8.510*** (3.045)	-8.056*** (2.973)
Services	-8.935*** (2.810)	0.0406 (0.121)	-8.854*** (2.650)	-7.580*** (2.534)
Constant	130.3*** (4.115)	-1.233*** (0.188)	129.2*** (3.868)	129.7*** (3.690)
athrho	0.540*** (0.192)			
Insigma	3.411*** (0.0537)			
	1,037	1,037	1,050 0.146	1,174 0.127

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 6 Firm activity estimation (b) Investment

	(5)	(6)	(7)	(8)
Dependent variable:	Investment	Constrained1	Investment	Investment
Estimation method:	Treatment regression		OLS	OLS
	Second stage	First stage		
Constrained1	0.169 (0.129)		0.130*** (0.0451)	0.168*** (0.0475)
F_Damage_Tangibles	0.395*** (0.0575)	0.151 (0.164)	0.403*** (0.0558)	
B_Special_Loss		52.15*** (18.12)		
Cus_Damage	0.00241 (0.0445)	-0.0754 (0.123)	0.00217 (0.0457)	0.00405 (0.0498)
Sup_Damage	-0.0437 (0.0439)	-0.104 (0.122)	-0.0520 (0.0450)	-0.0431 (0.0490)
Damaged_Area	0.109** (0.0541)	-0.00289 (0.150)	0.112** (0.0561)	0.177*** (0.0573)
Tsunami_Area	-0.0298 (0.0567)	0.371** (0.147)	-0.0358 (0.0543)	0.0428 (0.0577)
Evacuation_Area	0.139 (0.217)	-0.212 (0.631)	0.137 (0.225)	0.0874 (0.251)
Employment	-0.000524 (0.000324)	-0.00316*** (0.00112)	-0.000618** (0.000308)	-0.000753** (0.000335)
Business_Condition	-0.0229 (0.0228)	0.285*** (0.0545)	-0.0265 (0.0201)	-0.0151 (0.0216)
Leverage	-0.0446 (0.0306)	0.268*** (0.0899)	-0.0447 (0.0291)	-0.0303 (0.0321)
Manufacturing	0.00137 (0.0653)	0.121 (0.180)	0.0115 (0.0675)	-0.0346 (0.0702)
Utilities, IT, and Transportation	0.0883 (0.0799)	0.112 (0.222)	0.0965 (0.0830)	0.0351 (0.0895)
Wholesale	0.0759 (0.0736)	-0.315 (0.205)	0.0735 (0.0751)	0.00903 (0.0794)
Retail	-0.0219 (0.0716)	-0.0384 (0.198)	-0.0144 (0.0741)	-0.0537 (0.0803)
Services	0.0103 (0.0624)	0.107 (0.170)	0.0283 (0.0636)	-0.0141 (0.0657)
Constant	0.177** (0.0855)	-1.337*** (0.252)	0.205** (0.0878)	0.180** (0.0912)
athrho	-0.0639 (0.158)			
Insigma	-0.738*** (0.0307)			
Observations	552	552	563	621
R-squared			0.147	0.063

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 6 Firm activity estimation (c) Loan Ratio

	(9)	(10)	(11)	(12)
Dependent variable:	Loan_Ratio	Constrained1	Loan_Ratio	Loan_Ratio
Estimation method:	Treatment regression		OLS	OLS
	Second stage	First stage		
Constrained1	-0.808*** (0.0570)		0.0631 (0.0400)	0.116*** (0.0404)
F_Damage_Tangibles	0.571*** (0.0601)	0.469*** (0.101)	0.468*** (0.0503)	
B_Special_Loss		25.49*** (9.520)		
Cus_Damage	-0.0400 (0.0496)	0.0283 (0.0848)	-0.0500 (0.0414)	-0.0374 (0.0432)
Sup_Damage	-0.0170 (0.0496)	0.0342 (0.0850)	-0.0351 (0.0415)	-0.0416 (0.0435)
Damaged_Area	-0.0104 (0.0614)	0.0707 (0.104)	-0.0225 (0.0516)	0.0392 (0.0501)
Tsunami_Area	0.111* (0.0602)	0.107 (0.103)	0.0566 (0.0502)	0.155*** (0.0518)
Evacuation_Area	-0.215 (0.281)	-0.637 (0.493)	0.00602 (0.237)	-0.0149 (0.255)
Employment	-0.00154*** (0.000425)	-0.00317*** (0.000837)	-0.000387 (0.000348)	-0.000546 (0.000365)
Business_Condition	0.152*** (0.0226)	0.268*** (0.0385)	0.0625*** (0.0188)	0.0723*** (0.0192)
Leverage	0.553*** (0.0341)	0.247*** (0.0602)	0.482*** (0.0286)	0.474*** (0.0272)
Manufacturing	0.0863 (0.0730)	-0.0400 (0.125)	0.0818 (0.0614)	0.0400 (0.0627)
Utilities, IT, and Transportation	-0.0378 (0.0922)	-0.0682 (0.156)	-0.0150 (0.0772)	-0.0396 (0.0785)
Wholesale	0.0528 (0.0768)	-0.197 (0.132)	0.131** (0.0642)	0.0997 (0.0652)
Retail	0.130* (0.0768)	-0.186 (0.132)	0.185*** (0.0642)	0.130** (0.0654)
Services	0.0653 (0.0670)	0.00395 (0.113)	0.0626 (0.0559)	0.0503 (0.0560)
Constant	-0.0214 (0.101)	-1.130*** (0.179)	-0.114 (0.0843)	-0.137* (0.0834)
athrho	0.998*** (0.0592)			
Insigma	-0.302*** (0.0295)			
Observations	1,075	1,075	1,087	1,225
R-squared			0.310	0.245

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1