Multiple Lenders, Temporary Debt Restructuring, and Firm Performance: Evidence from Contract-Level Data

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1. <u>Motivation</u>

■ <u>Private debt restructuring</u> b/w borrower & lender(s)

☐ Important financial tool but little is known (Roberts *JFE* 2015)

- Demand, approval, and structure
- Reliable data?
- SME Finance Facilitation Act in Japan

■ A structure: "<u>temporary</u>" private debt restructuring ("<u>TDR</u>")

☐ Postponing repayments w/o debt reduction

☐ Repeated & expected debt restructuring

☐ 20-30% of all the debt restructuring in our data

Q. <u>Determinants & Impact on firm performance</u>?

⇒ Economic role of TDR: E.g., de fact Evergreening?
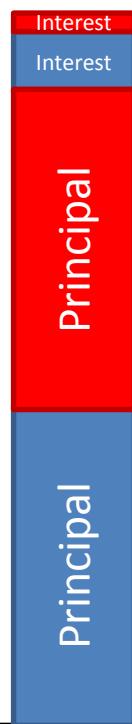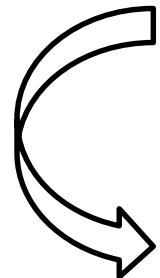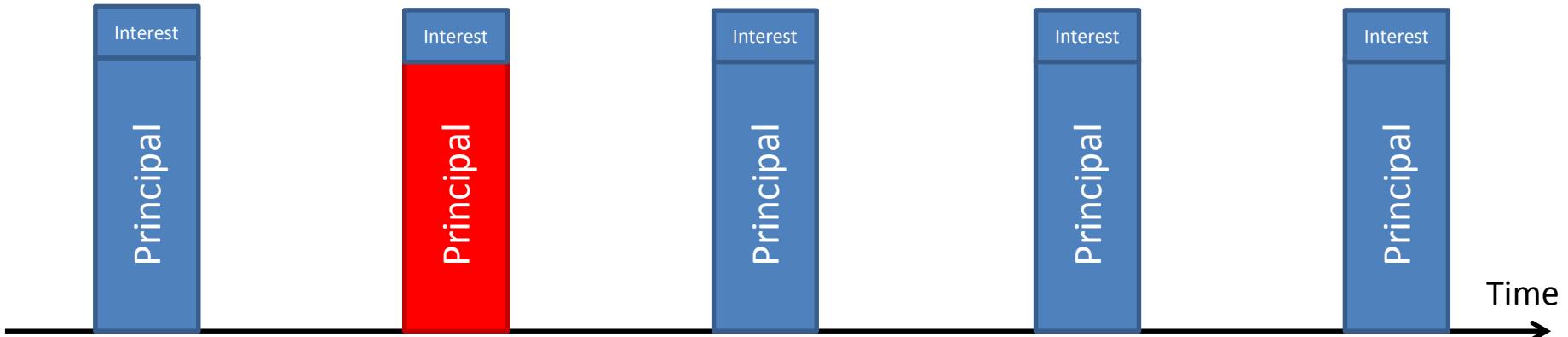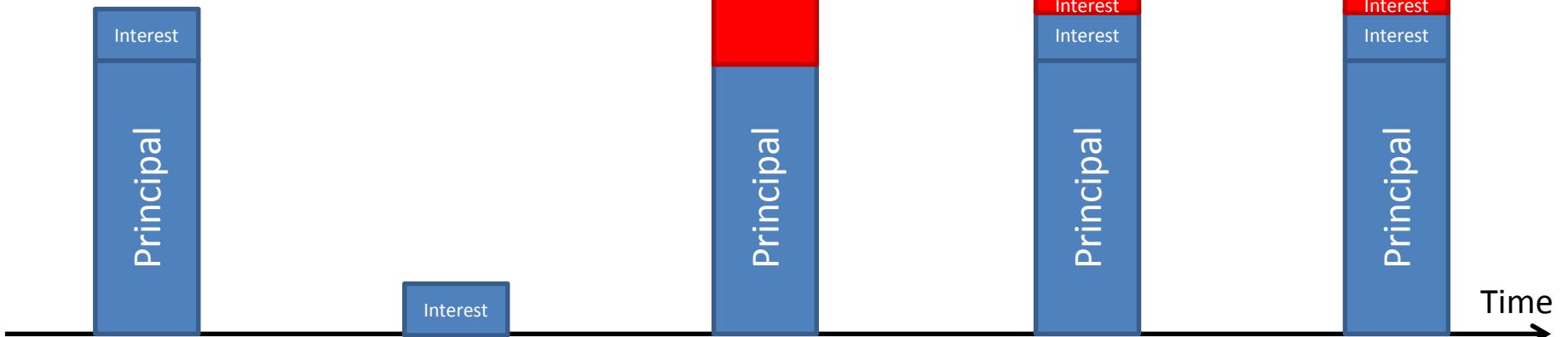
2. This paper

■ Using unique survey data for Japanese bank loan, we examine…

☐ Determinants of <u>demand</u> & <u>approval</u> of debt restructuring (☆ & ☆☆)

☐ Determinants of <u>TDR</u> (★ as well as among ×, △, ○)

☐ PSM-DID analysis of the <u>impact of TDR</u> on firm performance (b/w △ & ○)

All observations

With demand for debt restructuring ☆ Without demand for debt restructuring

Non-TDR (△)

Debt restructured

☆☆

Not debt restructured (×)

TDR (○)
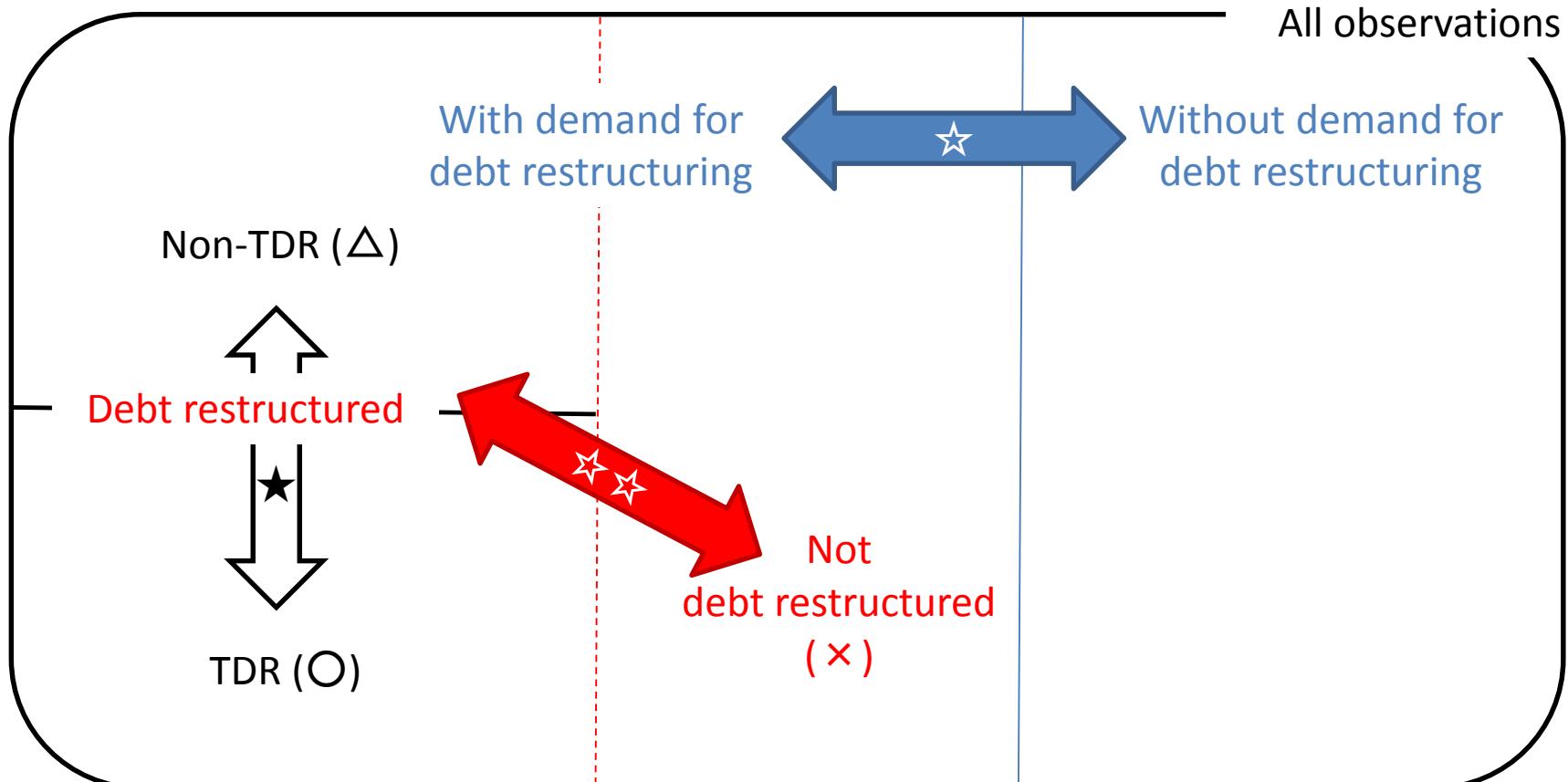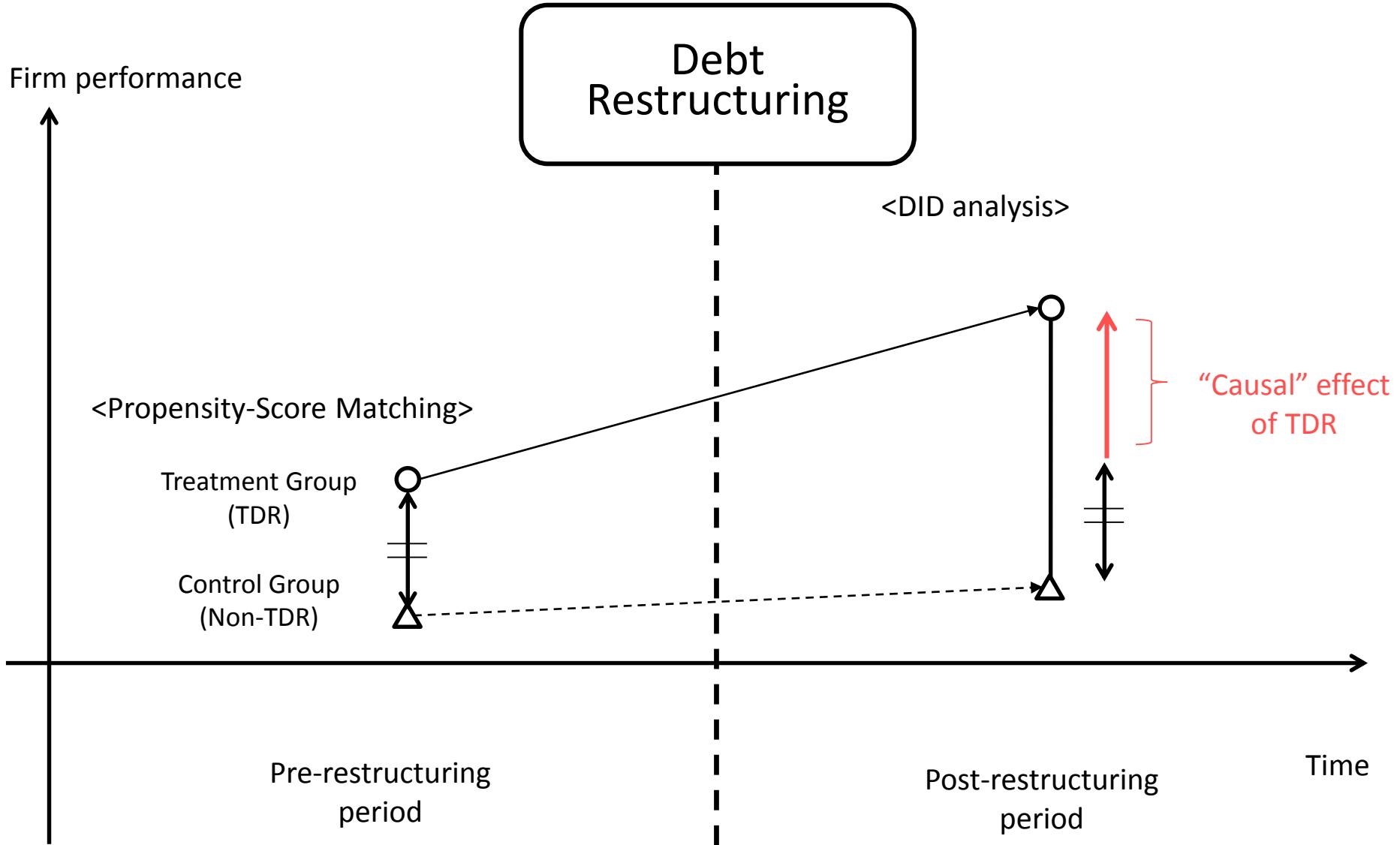
3. <u>Key Findings (i)</u>

■ **Pr(☆Demand for debt restructuring) ↑** when…

   ❑ Firm score↓ ⇔ <u>Firm quality↓</u>

   ❑ Firm debt ratio↑ ⇔ <u>Debt burden↑</u>

   ❑ Firm owner share↑ ⇔ <u>Private benefit↑</u> (<u>firm size↓</u>)

   ❑ #(BANKS)↑ ⇔ <u>Sparse relation (e.g., adverse selection)</u>

■ **Pr(☆☆Approval) ↑** among firms w/ demand when…

   ❑ Firm size↑, customer duration ↑, main bank duration ↑

   <u>Note</u>: Almost 70% of firms w/ demand were approved

   (Number becomes 96% if we exclude "self-constrained")

Makes it tricky to study Pr(Approval)

3. <u>Key Findings (ii)</u>

- **Pr(★TDR) ↑ among the debt-restructured firms when…**
  - ☐ #(BANKS)↑⇔ <u>Coordination failure</u>
  - ☐Under "SME Finance Facilitation Act" ⇔ <u>Bank's cost</u>↓

- <u>Negative DID (i.e., "causal") effect</u> of TDR on firm performance
  - ☐ Firm creditworthiness score & Lenders' attitude
  - ☐ Larger (-) for <u>later TDR</u> after the introduction of the act
  - ☐ Larger (-) for <u>worse lender banks</u>

⇒ **TDR was mainly used as de fact <u>evergreening lending</u>, which ended up the deterioration of borrower firm performance**

<PSM-DID result>
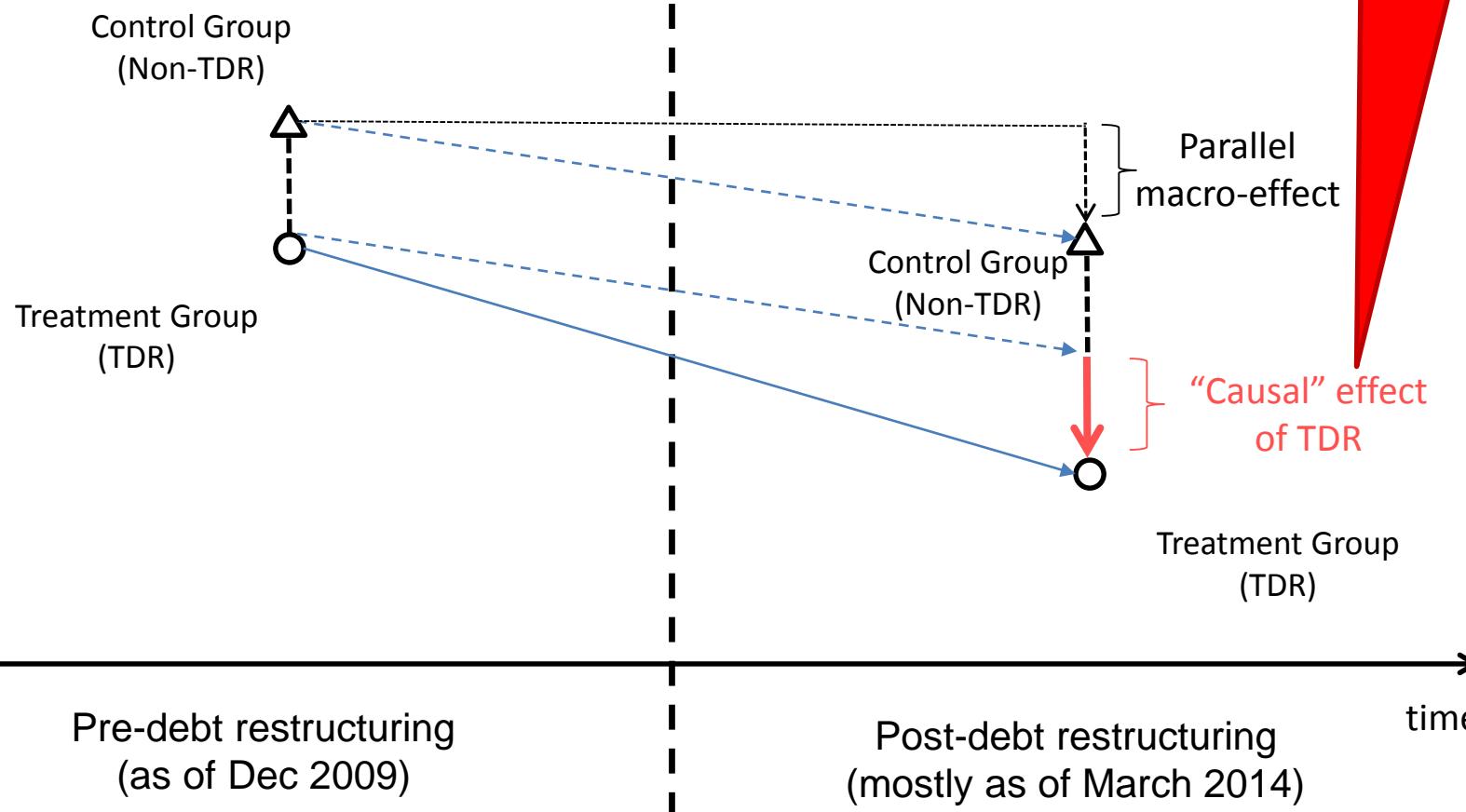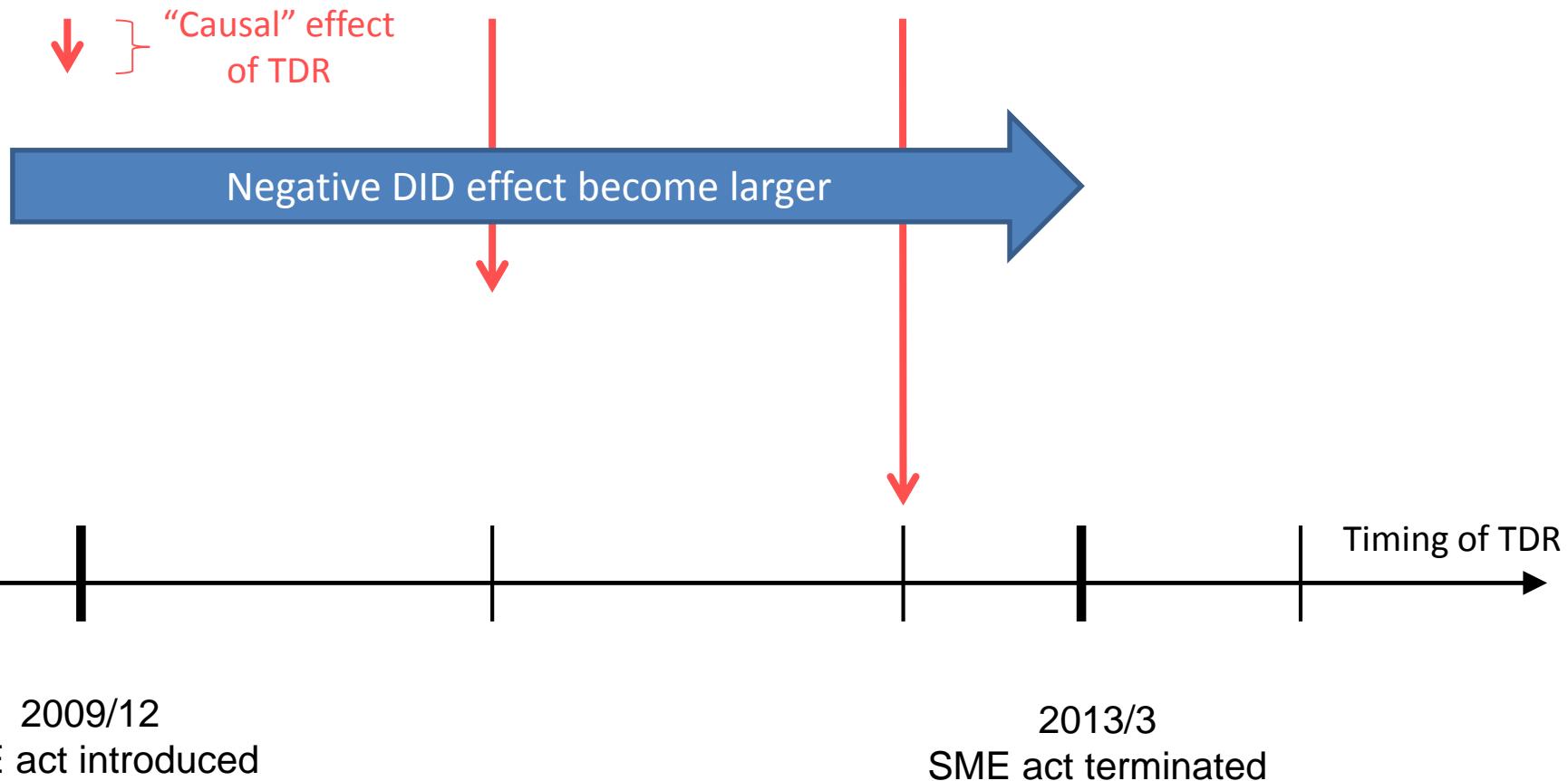
4. Literature (i):

■ Empirical studies on the <u>determinants</u> of debt restructuring

   ❑ Roberts & Sufi (JFE 2009), Roberts (JFE 2015)

   - 1000 US listed firms + hand-picked data for debt restructuring
   - Financial <u>health & uncertainty</u> of lender & borrower matter
   - <u>Duration</u> of the lending relationship matters
   - <u>Macroeconomic</u> condition matters

   ❑ Denis & Wang (JFE 2014)

   - Debt renegotiation is frequently observed

■ <u>Our paper</u>: **Study determinants of not only general but a specific restructuring type, then further study its impact**

4. Literature (ii):

■ Empirical studies on the <u>economic impact</u> of debt restructuring

  ☐ Gilson et al. (JFE 1990)

    • Announcement of debt-relief request ⇒ CAR↓, then ↑(concluded)

  ☐ Uchida & Goto (JCER 2002)

    • Announcement of debt-relief request ⇒ CAR↑

  ☐ Inoue et al. (JBF 2008)

    • "Non-main bank"-led restructuring resulted in better market reaction

    • Bank-led restructuring enhanced firm value <u>under severer regulation</u>

  ☐ Godlewski (JBF 2015)

    • Renegotiation of financial contracts ⇒ shareholder value↑

    • Amendments to covenants & loan amounts <u>increase CAR by 10–15%</u>

    • <u>Early and less frequent</u> is better

> All event study!

■ **<u>Our paper</u>: Revisit the question using non-event study method**

4. <u>Literature (iii):</u>

■ Debt restructuring under <u>multiple lender environment</u>

☐ Bolton & Sharfstein (JPE 1996), Dewatripon & Maskin (RFS 1995), Kasahara (JFS 2009)

- #(BANKS)↑ ⇔ More difficult to coordinate

☐ Detragiache et al. (JF 2000)

- #(BANKS)↑ ⇔ Less likely to be hit by liquidity shock

☐ Brunner & Krahnen (RFS 2000)

- Some institutional device (i.e., bank pool) lead to successful coordination when #(BANKS)↓

■ **Our paper: <u>Test these implications</u>**

4. Literature (iv):

- **Evergreening & its determinants**
  - ☐ Peek & Rosengren (AER 2005)
    - Evergreening

  - ☐ Inoue et al. (JBF 2008)
    - Weaker bank supervision↓ ⇒ evergreening
  - ☐ Bruche & Llobet (RFS 2014)
    - Lender bank B/S↓ ⇒ evergreening

- **Our paper: Revisit this issue by using debt restructuring instead of new money provision**

5. Data (i): Survey data

■ RIETI 2014 Survey

  ☐ Aim at studying the impact of the termination of SME Finance Facilitation Act (**Dec. 2009 – Mar. 2013**: extended twice)

  ☐ Conducted on **October, 2014** Originally effective only in two years

  ☐ Sent Questionnaire to 20,000 SMEs

   • Existing as of December 2009 (the timing of the act introduced)
   • Group-1: TSR reports on the firms contained "debt restructuring" or "SME Finance Facilitation Act"
   • Group-2: Surveyed firms in RIETI 2008 survey
   • Group-3: Firms with SCORE<=49 (distribution of #(employees)=Group-2)

  ☐ **6,002** firms responded to the survey (30.01%)

   • Group-1: 996
   • Group-2: 6,002
   • Group-3: 2,465

  ⇒ See Uesugi et al. (RIETI DP 2015) for more detail

5. Data (ii): Key question

■ Demand & approval

  ☐ Q.19_2: Have you ever had loan renegotiated since Dec. 2009?

   • Treat 1. to 4. as firms with demand for loan restructuring

   • Treat 5. as no demand

> We will do some Robustness checks for 3. & 4.

All observations

With demand for debt restructuring

Without demand for debt restructuring

1. Applied and approved

2. Applied but rejected

3. & 4. Wanted but not applied (self-constrained)

5. No need to apply

Debt restructured

Not debt restructured (✕)

5. Data (iii): Key question

■ Demand & approval

Q19_2	Freq.	Percent	Cum.
1	1,548	27.76	27.76
2	64	1.15	28.9
3	121	2.17	31.07
4	158	2.83	33.91
5	3,686	66.09	100
Total	5,577	100	

Very small

5. <u>Data (iv): Key questions</u>

■ <u>Temporal Debt Restructuring-1</u>

    ☐ Q.29: How to restructure debt?

        • Treat firms choosing 1. but not choosing any items from 2.to 6. as TDR1

        • Other cases are treated as not-TDR1

All observations

Non-TDR (△)

Debt restructured

TDR1 (○)

1. Postponing due date within one-year

without 2～6
(debt/interest reduction, longer postponing)
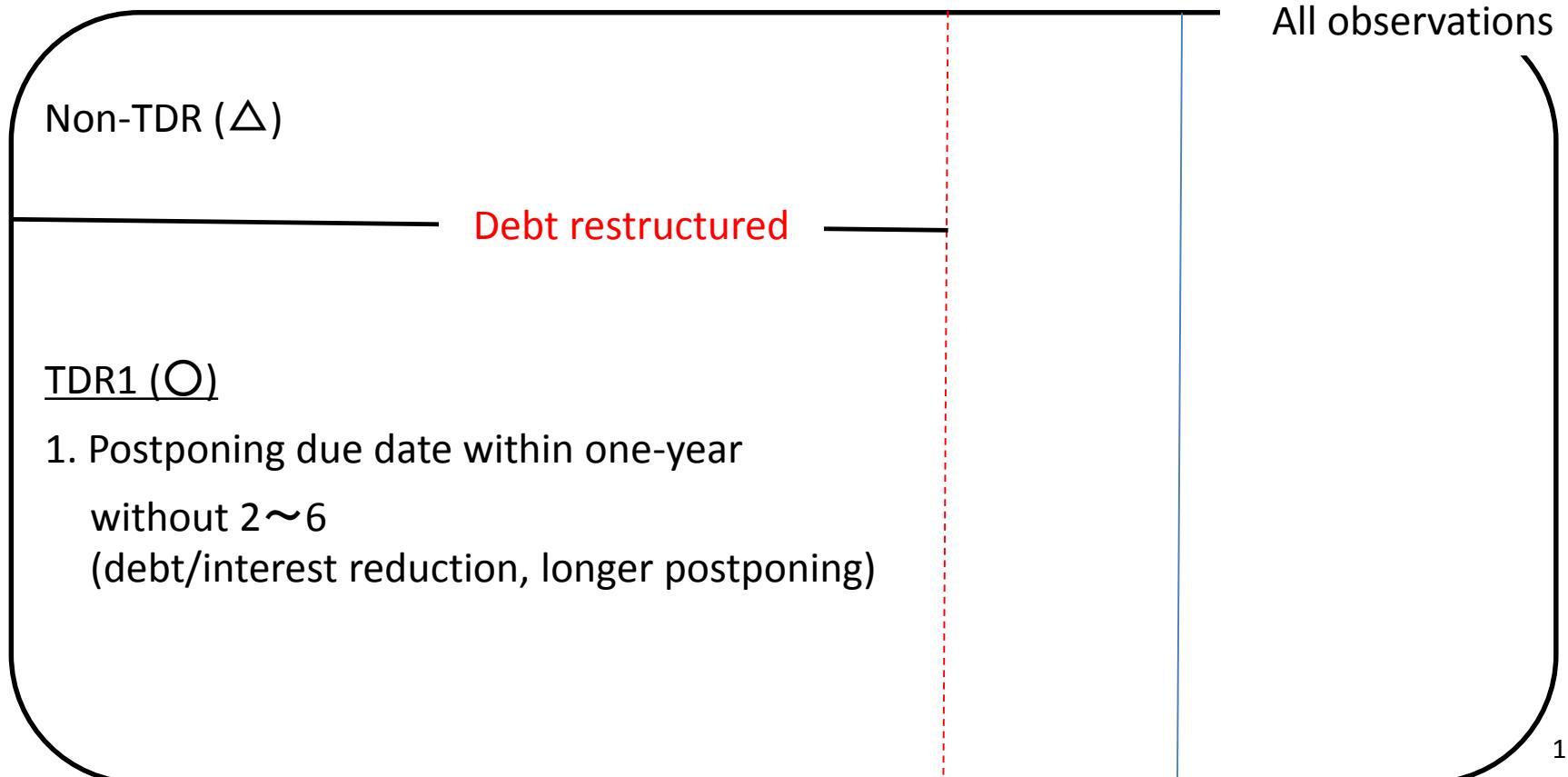
5. <u>Data (v): Key questions</u>

■ <u>Temporal Debt Restructuring-2</u>

☐ Q.39: Reason for multiple debt restructuring?

- This answer is conditional on having multiple debt restructuring
- Thus, we might mix up Pr(TDR2) and Pr(Multiple restructuring)

All observations

Non-TDR (△)

Debt restructured

It could be due to, for example, …
Q.39: 1. Infeasible plan
    3. Change in business environment
    4. Insufficient financial support
    5. Insufficient business effort

<u>TDR2 (○)</u>

2. Expected as of the initial debt restructuring
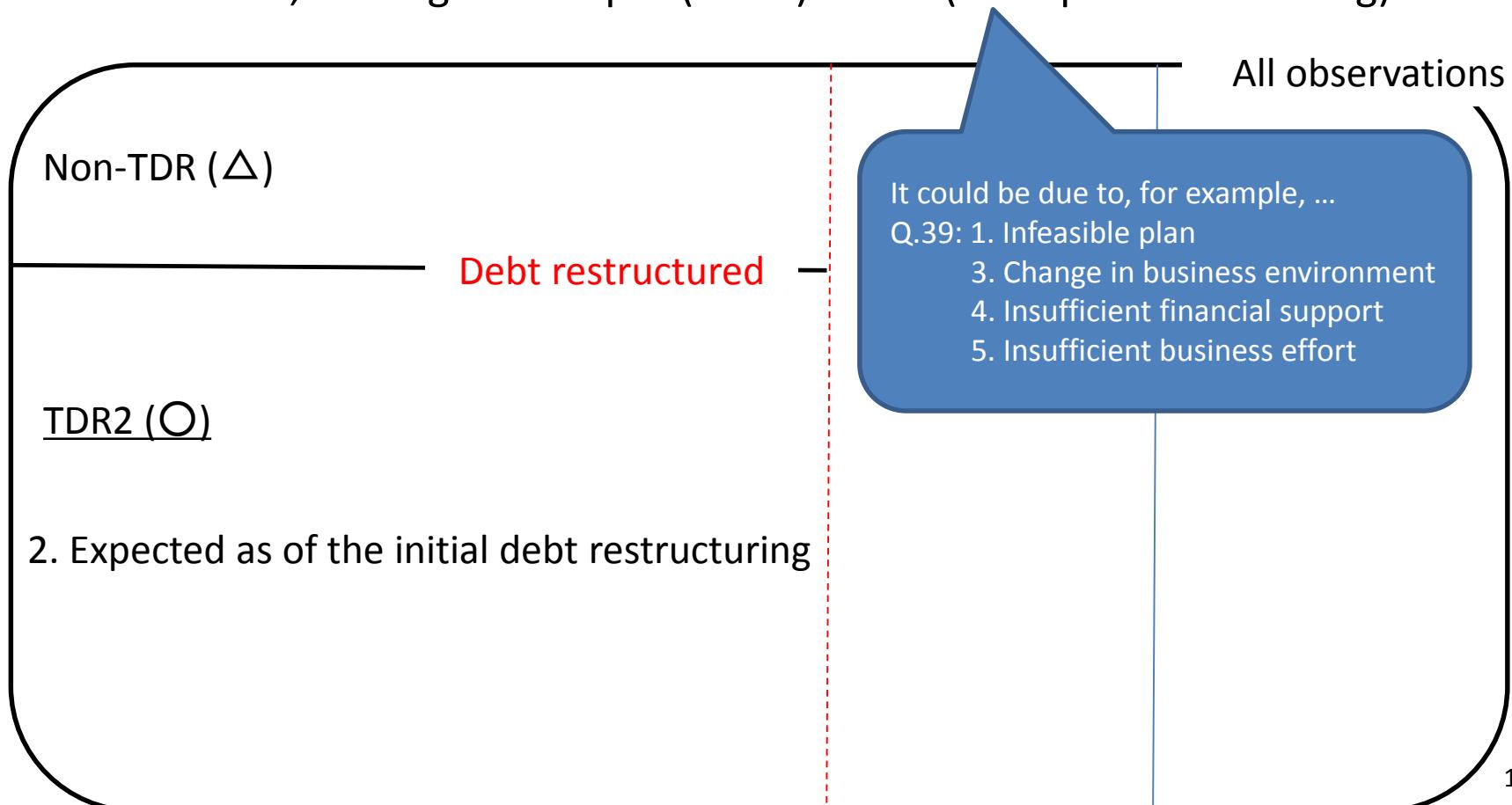
5. Data (vi): Key questions

■ Cross-tabulation of TDR1 & TDR2

☐ Correlation (TDR1=1, TDR2=1) = 0.1031***

		TDR2		
		no	yes	Total
TDR1	no	919	317	1236
	yes	196	116	312
	Total	1115	433	1548

6. <u>Univariate (i): Demand & Indep var</u>

■ <u>Demand: yes when …</u>

☐ <u>Lower score</u>, smaller size, <u>higher debt ratio</u>

☐ <u>Lager #(bank)</u>, longer main bank relation

☐ Independent firms, with <u>larger ownership share</u>, lower intention to continue business

☐ shorter customer relation, <u>shorter supplier relation</u>

> <u>Underline</u>: Survive in multivariate analysis
> ⇒Robust for the set-up of yes/no

| Variable | Definition | Demand: yes | | | Demand: no | | | t-test |
		Obs	Mean	Std. Dev	Obs	Mean	Std. Dev	for diff
SCORE_200912	Firm's TSR score as of Dec 2009	1889	47.095	5.040	3684	51.215	6.845	***
LN_NUMEMP_200912	LN(firm total assets) as of Dec 2009	1888	3.136	1.155	3680	3.361	1.309	***
DEBTRATIO_PRE2	Firm debt/total assets as of Dec 2009	1631	1.056	1.327	3354	0.643	1.767	***
LN_NUMBANK	#(lender banks) as of recent period	1758	1.114	0.606	2995	1.017	0.691	***
AGE	Age of firm as of recent period	1785	49.612	132.916	3546	45.783	76.089	
indep	1 if firm is independent	1891	0.889	0.314	3686	0.794	0.404	***
ownershipshare	Ownership share as of recent period	1891	75.025	34.216	3686	62.188	39.620	***
manageaccount	1 if using management account	1891	0.995	0.073	3686	0.995	0.072	
customer_duration	Length of main customer realtion	1467	25.993	16.413	2959	28.197	17.261	***
supplier_duration	Length of main supplier realtion	1605	25.087	15.508	3136	27.631	16.243	***
mainbankduration	Length of main bank realtion	1891	25.834	18.506	3686	23.350	20.492	***
duration_mminuss	Diff of main and sub bank relations	1891	8.418	18.559	3686	8.690	18.592	
businesscontinue	1 if firm intends to continue business	1891	0.782	0.413	3686	0.826	0.379	***

6. Univariate (ii): Approval & Indep var

■ **Approval: yes when …**

  ☐ Higher score, larger size

  ☐ Longer main bank relation

  ☐ Larger intention to continue business

Results are weak in multivariate analysis

Variable	Definition	Approval: yes			Approval: no			t-test for diff
		Obs	Mean	Std. Dev	Obs	Mean	Std. Dev	
SCORE_200912	Firm's TSR score as of Dec 2009	1548	47.199	4.877	341	46.625	5.707	*
LN_NUMEMP_200912	LN(firm total assets) as of Dec 2009	1547	3.165	1.145	341	3.001	1.193	**
DEBTRATIO_PRE2	Firm debt/total assets as of Dec 2009	1343	1.057	1.392	288	1.052	0.968	
LN_NUMBANK	#(lender banks) as of recent period	1441	1.123	0.601	317	1.071	0.625	
AGE	Age of firm as of recent period	1460	46.083	104.524	325	65.465	218.562	
indep	1 if firm is independent	1548	0.895	0.307	343	0.863	0.344	
ownershipshare	Ownership share as of recent period	1548	75.282	34.020	343	73.862	35.115	
customer_duration	Length of main customer realtion	1186	26.046	16.167	281	25.772	17.438	
supplier_duration	Length of main supplier realtion	1315	25.169	15.470	290	24.717	15.701	
mainbankduration	Length of main bank realtion	1548	26.216	18.490	343	24.114	18.509	*
duration_mminuss	Diff of main and sub bank relations	1548	8.526	18.426	343	7.933	19.167	
businesscontinue	1 if firm intends to continue business	1548	0.791	0.407	343	0.743	0.437	*

6. Univariate (iii): TDR & Indep var

■ TDR1 & 2=yes when …

  ☐ Severe impact without debt restructuring, lower score

  ☐ Lager #(bank), borrowing from banks changing their attitude due to the act, borrowing from city banks

  ☐ Shorter supplier relation, Using public guarantee, During the act

Variable	TDR1: yes			TDR1: no			t-test for diff	TDR2: yes			TDR2: no			t-test for diff
	Obs	Mean	Std. Dev	Obs	Mean	Std. Dev		Obs	Mean	Std. Dev	Obs	Mean	Std. Dev	
severeimpact	312	0.856	0.352	1236	0.625	0.484	***	433	0.908	0.290	1115	0.580	0.494	***
SCORE_200912	312	46.699	4.587	1236	47.325	4.941	**	433	46.711	4.402	1115	47.388	5.038	**
LN_NUMEMP_200912	312	3.273	1.156	1235	3.138	1.141	*	433	3.161	1.107	1114	3.167	1.160	
DEBTRATIO_PRE2	265	1.181	2.279	1078	1.027	1.066		390	1.083	0.684	953	1.047	1.594	
LN_NUMBANK	295	1.204	0.597	1146	1.102	0.601	***	421	1.263	0.567	1020	1.065	0.606	***
AGE	294	46.541	116.352	1166	45.967	101.378		418	48.935	137.422	1042	44.939	87.993	
indep	312	0.933	0.251	1236	0.885	0.319	**	433	0.903	0.296	1115	0.891	0.311	
ownershipshare	312	77.248	33.025	1236	74.786	34.262		433	76.503	32.887	1115	74.808	34.453	
customer_duration	235	23.936	15.603	951	26.567	16.270	**	334	25.461	15.867	852	26.275	16.287	
supplier_duration	258	22.547	14.477	1057	25.809	15.643	***	384	24.057	14.754	931	25.627	15.741	*
pubguarantee	312	0.833	0.373	1236	0.744	0.437	***	433	0.855	0.353	1115	0.726	0.446	***
bankattitude_intro	312	0.333	0.472	1236	0.219	0.414	***	433	0.289	0.454	1115	0.224	0.417	***
bankattitude_end	312	0.250	0.434	1236	0.214	0.411		433	0.252	0.435	1115	0.210	0.407	*
mainbankduration	312	23.721	17.990	1236	26.845	18.568	***	433	25.859	16.998	1115	26.354	19.043	
duration_mminuss	312	7.192	17.296	1236	8.862	18.692		433	7.339	16.492	1115	8.986	19.111	
businesscontinue	312	0.795	0.404	1236	0.790	0.408		433	0.801	0.399	1115	0.787	0.410	
productinnov	312	0.497	0.501	1236	0.405	0.491	***	433	0.443	0.497	1115	0.416	0.493	
processinov	312	0.545	0.499	1236	0.474	0.500	**	433	0.513	0.500	1115	0.479	0.500	
afterlaw	272	0.129	0.335	998	0.196	0.397	**	379	0.098	0.297	891	0.218	0.413	***
CITY	312	0.157	0.364	1236	0.117	0.322	*	433	0.173	0.379	1115	0.107	0.309	***
REG	312	0.337	0.473	1236	0.322	0.467		433	0.335	0.472	1115	0.321	0.467	
REG2	312	0.103	0.304	1236	0.103	0.304		433	0.109	0.311	1115	0.100	0.301	
CREDIT	312	0.298	0.458	1236	0.244	0.430	*	433	0.245	0.430	1115	0.259	0.438	
SHOCHU	312	0.032	0.176	1236	0.025	0.156		433	0.025	0.158	1115	0.027	0.162	

■ Additional variables

- ☐ LN_NUMGRANTBANK: #(banks actually approving debt restructuring)
- ☐ pubgurantee: 1 if restuructured debt is guaranteed by public insurance
- ☐ bankattitude_intro: 1 if bank relaxed their attitude toward debt restructuring after the introduction of the act
- ☐ bankattitude_end: 1 if bank tightened their attitude toward debt restructuring after the termination of the act
- ☐ productinnov: 1 if the business plan submitted to banks during the process of debt restructuring contained product innovation
- ☐ processinov : 1 if the business plan submitted to banks during the process of debt restructuring contained process innovation
- ☐ afterlaw: 1 if debt restructuring is after the termination of the act
- ☐ CITY: 1 if granting bank is city banks
- ☐ REG: 1 if granting bank is first-tier regional bank
- ☐ REG2: 1 if granting bank is second-tier regional bank
- ☐ CREDIT: 1 if granting bank is either credit union or credit cooperative
- ☐ SHOCHU: 1 if granting bank is shoko-chukin

7. <u>Multivariate (i)</u>

■ Empirical strategy

    ❑ Probit for TDR2

    ❑ PSM-DID based on TDR2 estimation

    ❑ Nearest neighbor matching without replace

    ❑ Check the balancing for SCORE_200912

7. Multivariate (ii)

■ TDR1 or 2=1

Three key determinants

Probit Estimates (A dummy variable for temporary debt restructuring)							
	TDR1			**TDR2**			
Independent Variables	dy/dx	Robust Std. Err.		dy/dx	Robust Std. Err.		
severeimpact	0.1173	0.030	***	0.2313	0.033	***	
SCORE_200912	0.0000	0.003		-0.0033	0.004		
LN_NUMEMP_200912	0.0162	0.014		-0.0308	0.018	*	
DEBTRATIO_PRE2	0.0128	0.014		-0.0196	0.014		
LN_NUMBANK	0.0600	0.023	***	0.1479	0.028	***	
AGE	-0.0002	0.000		0.0018	0.001		
indep	0.0226	0.048		0.0150	0.060		
ownershipshare	0.0007	0.000		-0.0003	0.001		
customer_duration	0.0003	0.001		0.0003	0.001		
supplier_duration	-0.0010	0.001		-0.0015	0.001		
pubguarantee	-0.0015	0.038		0.0457	0.044		
bankattitude_intro	0.0701	0.034	**	-0.0402	0.037		
bankattitude_end	-0.0211	0.032		0.0062	0.041		
mainbankduration	-0.0013	0.001		-0.0026	0.001	*	
duration_mminuss	-0.0002	0.001		0.0025	0.001	**	
businesscontinue	-0.0187	0.036		0.0641	0.040		
productinnov	0.0142	0.031		-0.0268	0.038		
processinov	-0.0286	0.031		-0.0338	0.037		
afterlaw	-0.0632	0.033	*	-0.1169	0.042	**	
REG	0.0558	0.040		-0.0561	0.043		
REG2	0.0160	0.052		-0.0736	0.052		
CREDIT	0.0542	0.044		-0.0630	0.046		
SHOCHU	0.0227	0.077		0.0007	0.099		
No. of Obs.	820			820			
Wald Chi2	65.48			105.67			
Prob > Chi2	0.0000			0.0000			
Pseudo R2	0.0780			0.1267			
Log Likelihood	-377.04			-444.62			

8. PSM-DID (i): Balancing

■ Propensity score based on the probit estimation for TDR2

☐ Nearest neighbor matching without replace

☐ Check the balancing for SCORE_200912

Treated	SCORE_200912
AVR	47.570
STD	4.478
OBS	820

-

Control	SCORE_200912
AVR	47.609
STD	4.656
OBS	820

=

diff balancing	SCORE_200912
AVR	-0.039
STD	6.127
OBS	820

t-value is -0.182
⇔well balanced

8. PSM-DID (ii): DID & DIDID

■ Regression-based DID & DIDID estimations

DID effect

$$SCORE = \theta_0 + \theta_1 TDR + \theta_2 POST + \boxed{\theta_3}(TDR \times POST)$$

$$SCORE = \phi_0 + \phi_1 TDR + \phi_2 POST + \phi_3 \underline{AFTERLAW}$$

DID effect for "during law"

DID effect after law

$$+ \boxed{\phi_4} (TDR \times POST) + \phi_5(TDR \times \underline{AFTERLAW})$$

$$+ \phi_6 (POST \times \underline{AFTERLAW})$$

$$+ \boxed{\phi_7} (TDR \times POST \times \underline{AFTERLAW})$$

$$SCORE = \Psi_0 + \Psi_1 TDR + \Psi_2 POST + \Psi_3 \underline{TIMETOEND}$$

DID effect at TIMETOEND=0

DID effect at each point

$$+ \boxed{\Psi_4} (TDR \times POST) + \Psi_5(TDR \times \underline{TIMETOEND})$$

$$+ \Psi_6(POST \times \underline{TIMETOEND})$$

$$+ \boxed{\Psi_7} (TDR \times POST \times \underline{TIMETOEND})$$

6. PSM-DID (iii): Results for SCORE
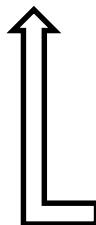
	OLS estimation								
	DID analysis			DIDID analysis			DIDID analysis		
Independent Variables	Coef.	Robust Std. Err.		Coef.	Robust Std. Err.		Coef.	Robust Std. Err.	
TDR	-0.9302	0.228	***	-0.9834	0.239	***	-0.5662	0.463	
POST	-0.8288	0.214	***	-0.8608	0.239	***	-0.6502	0.314	**
AFTERLAW				-0.3254	0.367	***			
TIMETOEND							-0.0191	0.008	**
TDR×POST	-1.0833	0.360	***	-0.9624	0.382	**	-2.1418	0.734	***
TDR×AFTERLAW				0.1471	0.944				
POST×AFTERLAW				0.1577	0.532				
TDR×POST×AFTERLAW				-1.3886	1.351				
TDR×TIMETOEND							-0.0073	0.015	
POST×TIMETOEND							-0.0100	0.012	
TDR×POST×TIMETOEND							0.0430	0.024	*
const	47.8794	0.142	***	47.9455	0.157	***	48.2214	0.215	***
No. of Obs.	3,278			3,278			3,278		
F	37.35			16.63			18.60		
Prob > F	0.0000			0.0000			0.0000		
R-squared	0.0344			0.0355			0.0410		
Root MSE	4.9418			4.9420			4.9280		

Sum is significant

H0: b(TDR×POST)+b(TDR×POST×AFTERLAW)=0, Prob > F=0.0696

6. PSM-DID (iv): Other measures

■ Other survey responses accounting for the change in…

$$\Delta \text{Measures} = v_0 + v_1 \text{TDR}$$

	OLS estimation							
	"Business condition"		"Cash management"		"Banks' lending attitude"		"Banks' lending attitude"	
Dep var:	Change from 2009/12						Change from the initial debt restructuring	
	DID analysis		DID analysis		DID analysis		DID analysis	
Independent Variables	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.
TDR	-0.7632	0.066	0.0653	0.068	0.1082	0.065 *	0.1691	0.057 ***
const	2.7677	0.036 ***	2.7101	0.036 ***	2.8254	0.035 ***	2.6849	0.030 ***
No. of Obs.	1,640		1,640		1,640		1,640	
F	1.35		0.92		2.76		2.76	
Prob > F	0.2463		0.3384		0.0966		0.0966	
R-squared	0.0008		0.0006		0.0017		0.0017	
Root MSE	1.2241		1.2476		1.1999		1.1999	

6. <u>PSM-DID (v): SCORE & Bank NPL ratio</u>

■ Split the sample based on lender banks' NPL ratio

Dep var:	OLS estimation							
	Score			"Banks' lending attitude" Change from 2009/12			"Banks' lending attitude" Change from the initial debt restructuring		
	DID analysis			DID analysis			DID analysis		
Independent Variables	Coef.	Robust Std. Err.		Coef.	Robust Std. Err.		Coef.	Robust Std. Err.	
Firms borrowing from NPLratio >= Median									
TDR	-1.2447	0.558	**	0.3358	0.150	**	0.3222	0.129	**
POST	-0.9571	0.480	**						
TDR×POST	-1.2720	0.815							
const	47.7864	0.324	***	2.7476	0.082	***	2.6566	0.075	***
No. of Obs.	603			302			292		
F	12.15			5.04			6.25		
Prob > F	0.0000			0.0255			0.0130		
R-squared	0.0551			0.0170			0.0205		
Root MSE	4.774			1.1919			1.0449		
Firms borrowing from NPLratio < Median									
TDR	-1.3862	0.554	**	-0.0627	0.145		0.2940	0.128	**
POST	-0.8469	0.505	*						
TDR×POST	-1.2642	0.812							
const	48.5714	0.342	***	2.8776	0.083	***	2.5751	0.077	***
No. of Obs.	608			304			300		
F	12.63			0.19			5.26		
Prob > F	0.0000			0.6655			0.0225		
R-squared	0.0574			0.0006			0.0173		
Root MSE	4.8876			1.1868			1.0639		

8. <u>Discussion</u>

■ Economic implication

□ #(Lenders) ⇔ Coordination failure ⇒ TDR

□ TDR can be employed to manage "something"

- E.g., liquidation of NPV>0 can be avoided through TDR
- Esp., right after the introduction of SME act

⇒ -0.4218 (=-2.1418 + 0.0430*40) vs -2.1418

□ On average, TDR has a negative impact

- NPV<0 is likely to be chosen for TDR

□ Loose regulation ⇒ Temporary reaction from worse banks

⇔ Inoue et al. (JBF 2008) & Bruche & Llobet (RFS 2014)

⇒ Supporting the view "<u>TDR = de fact evergreening</u>"

9. Conclusion

■ Summary
  ☐ Causes of private debt restructuring (demand & TDR)
  ☐ TDR's implication

■ <u>Things to be done</u>
  ☐ Other variation of DID (e.g., debt restructuring itself)
  ☐ Refinements
    • (i) Drop variables with smaller #(obs), (ii) refine TDR2 (e.g., conditioning it on not choosing 3.), and (iii) controlling for debt maturity by including short-term/long-term debt
  ☐ More plausible matching?

Additional material (i): Demand estimation

	Probit Estimates (A dummy variable for demanding debt restructuring)								
	Baseline			Treat Choice = 1 or 2 as demand = yes			Exclude Treat Choice = 3 or 4		
Independent Variables	dy/dx	Robust Std. Err.		dy/dx	Robust Std. Err.		dy/dx	Robust Std. Err.	
SCORE_200912	-0.0211	0.003	***	-0.0181	0.002	***	-0.0196	0.003	***
LN_NUMEMP_200912	-0.0043	0.009		-0.0031	0.008		-0.0035	0.009	
DEBTRATIO_PRE2	0.1173	0.053	**	0.0994	0.045	**	0.1086	0.050	**
LN_NUMBANK	0.0886	0.016	***	0.0740	0.015	***	0.0834	0.016	***
AGE	0.0001	0.000		0.0001	0.000		0.0001	0.000	
indep	0.0391	0.028		0.0361	0.026		0.0380	0.027	
ownershipshare	0.0013	0.000	***	0.0012	0.000	***	0.0013	0.000	***
manageaccount	0.1840	0.105		0.1247	0.108		0.1468	0.105	
customer_duration	0.0002	0.001		-0.0001	0.001		0.0000	0.001	
supplier_duration	-0.0010	0.001		-0.0012	0.001	*	-0.0012	0.001	*
mainbankduration	-0.0002	0.001		0.0007	0.001		0.0004	0.001	
duration_mminuss	0.0000	0.001		-0.0003	0.001		-0.0002	0.001	
businesscontinue	-0.0321	0.023		-0.0245	0.022		-0.0288	0.023	
No. of Obs.	3,298			3,298			3,128		
Wald Chi2	233.67			217.10			221.40		
Prob > Chi2	0.0000			0.0000			0.0000		
Pseudo R2	0.1096			0.0977			0.1101		
Log Likelihood	-1902.21			-1815.28			-1734.73		

Additional material (ii): Approval estimation

	Probit Estimates (A dummy variable for debt restructuring approved)				
	Baseline		Treat Q.19_2 = 1 or 2 as demand = yes		
Independent Variables	dy/dx	Robust Std. Err.	dy/dx	Robust Std. Err.	
SCORE_200912	0.0008	0.003	0.0014	0.001	
LN_NUMEMP_200912	0.0121	0.012	0.0134	0.006	**
DEBTRATIO_PRE2	0.0179	0.011	0.0029	0.003	
LN_NUMBANK	-0.0019	0.021	-0.0023	0.010	
AGE	0.0000	0.000	0.0000	0.000	
indep	0.0507	0.043	0.0428	0.028	**
ownershipshare	0.0004	0.000	0.0002	0.000	
customer_duration	0.0001	0.001	0.0009	0.000	**
supplier_duration	-0.0013	0.001	-0.0004	0.000	
mainbankduration	0.0017	0.001 *	-0.0007	0.000	
duration_mminuss	-0.0005	0.001	0.0005	0.000	
businesscontinue	-0.0074	0.028	-0.0146	0.010	
No. of Obs.	1,154		984		
Wald Chi2	12.24		29.13		
Prob > Chi2	0.4269		0.0038		
Pseudo R2	0.0109		0.0625		
Log Likelihood	-536.96		-147.82		

Additional material (iii): TDR estimation

Probit Estimates (A dummy variable for temporary debt restructuring)					
	TDR1			TDR2	
Independent Variables	dy/dx	Robust Std. Err.		dy/dx	Robust Std. Err.	
severeimpact	0.1173	0.030	***	0.2313	0.033	***
SCORE_200912	0.0000	0.003		-0.0033	0.004	
LN_NUMEMP_200912	0.0162	0.014		-0.0308	0.018	*
DEBTRATIO_PRE2	0.0128	0.014		-0.0196	0.014	
LN_NUMBANK	0.0600	0.023	***	0.1479	0.028	***
AGE	-0.0002	0.000		0.0018	0.001	
indep	0.0226	0.048		0.0150	0.060	
ownershipshare	0.0007	0.000		-0.0003	0.001	
customer_duration	0.0003	0.001		0.0003	0.001	
supplier_duration	-0.0010	0.001		-0.0015	0.001	
pubguarantee	-0.0015	0.038		0.0457	0.044	
bankattitude_intro	0.0701	0.034	**	-0.0402	0.037	
bankattitude_end	-0.0211	0.032		0.0062	0.041	
mainbankduration	-0.0013	0.001		-0.0026	0.001	*
duration_mminuss	-0.0002	0.001		0.0025	0.001	**
businesscontinue	-0.0187	0.036		0.0641	0.040	
productinnov	0.0142	0.031		-0.0268	0.038	
processinov	-0.0286	0.031		-0.0338	0.037	
afterlaw	-0.0632	0.033	*	-0.1169	0.042	**
REG	0.0558	0.040		-0.0561	0.043	
REG2	0.0160	0.052		-0.0736	0.052	
CREDIT	0.0542	0.044		-0.0630	0.046	
SHOCHU	0.0227	0.077		0.0007	0.099	
No. of Obs.	820			820		
Wald Chi2	65.48			105.67		
Prob > Chi2	0.0000			0.0000		
Pseudo R2	0.0780			0.1267		
Log Likelihood	-377.04			-444.62		

Additional material (iv): TDR multinomial logit estimation

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Multinomial Logit Estimates
(Not approved vs. Approved with TDR=0 vs. Approved with TDR=1 (Basecase = not approved)

</div>

Independent Variables	Approved & TDR1=0		Approved & TDR1=1		Approved & TDR2=0		Approved & TDR2=1	
	dy/dx	Delta-metod Std. Err.	dy/dx	Delta-metod Std. Err.	dy/dx	Delta-metod Std. Err.	dy/dx	Delta-metod Std. Err.
SCORE_200912	-0.0006	0.003	-0.0039	0.002 **	0.0059	0.003 **	-0.0044	0.003
LN_NUMEMP_200912	-0.0084	0.014	0.0208	0.010 **	-0.0147	0.014	0.0261	0.012 **
DEBTRATIO_PRE2	0.0063	0.016	0.0214	0.011 **	-0.0145	0.013	0.0187	0.012
LN_NUMBANK	-0.0217	0.027	0.0453	0.019 **	-0.0543	0.026 **	0.0542	0.024 **
AGE	0.0002	0.000	-0.0002	0.000	0.0002	0.000	-0.0002	0.000
indep	0.0004	0.050	0.0370	0.041	-0.0119	0.051	0.0453	0.050
ownershipshare	-0.0001	0.000	0.0004	0.000	-0.0002	0.000	0.0005	0.000
customer_duration	0.0002	0.001	0.0007	0.001	0.0000	0.001	0.0010	0.001
supplier_duration	-0.0002	0.001	-0.0013	0.001	0.0011	0.001	-0.0015	0.001
bankattitude_intro	-0.0460	0.034	0.0771	0.022 ***	-0.0729	0.030 **	0.0866	0.027 ***
bankattitude_end	-0.0111	0.036	-0.0180	0.025	-0.0291	0.033	-0.0238	0.030
mainbankduration	0.0030	0.001 ***	-0.0007	0.001	0.0010	0.001	-0.0015	0.001
duration_mminuss	-0.0011	0.001	0.0002	0.001	0.0000	0.001	0.0003	0.001
businesscontinue	-0.0161	0.036	-0.0201	0.026	-0.0060	0.034	-0.0207	0.031
productinnov	0.0046	0.032	0.0227	0.024	-0.0237	0.031	0.0193	0.029
processinov	0.0783	0.032 **	0.0132	0.024	0.0155	0.030	-0.0010	0.029
No. of Obs.	1,228				986			
Wald Chi2	89.36				89.4			
Prob > Chi2	0.0000				0.0000			
Pseudo R2	0.0392				0.0609			
Log Likelihood	-1083.3634				-589.0959			

Thank you and comments are welcome!

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