



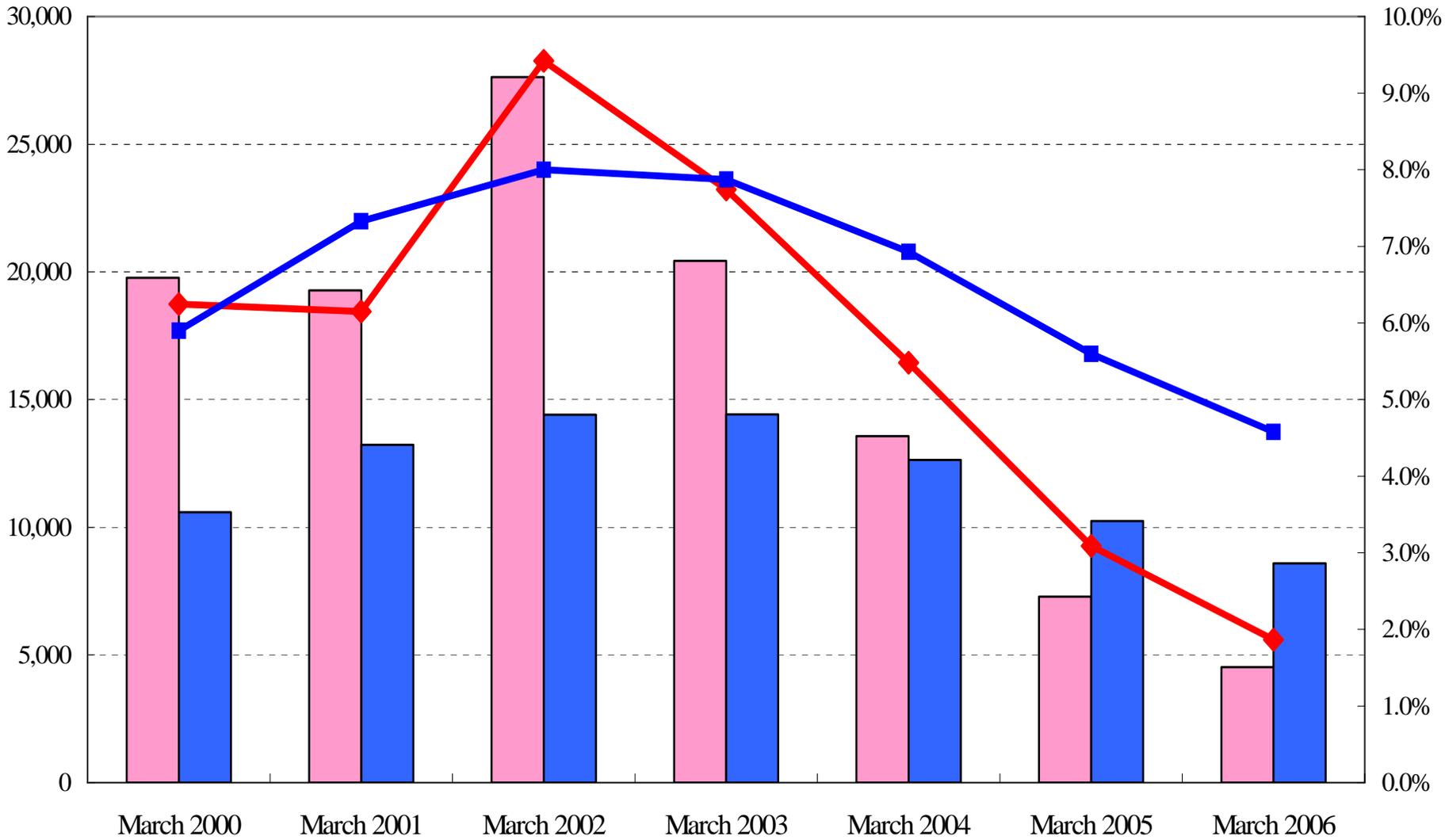
Debt Forgiveness during the ‘Lost Decade’: Impacts of the Industrial Revitalization Corporation of Japan

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Figure 1: Amount of Risk Management Loans in Japan

Billion yen



Debt-overhang Problem

$$D > X > L$$

D: Outstanding of existing debt

X: Net present value of project

L: Liquidation value of the project

- Existing lenders need to agree to forgive a part of debts, $D - X$, for the borrower to continue a socially profitable project with $X > L$.
- However, in the case with many lenders, continuation of the project is not a Nash equilibrium in the non-cooperative game .(Gertner and Sharfstein [1991])
- It is important how burdens of debt forgiveness, $D - X$, would be allocated among many lenders.

Cooperative game (1)

- Lender $i=(A,B,C)$, lender share($\alpha > \beta > \gamma$)
- S : Coalition
- $v(S)$: Revenue from coalition S
- Shapley value uniquely determines the payoff, x_i , for lender i as weighted average of payoffs across possible coalitions.

- Payoff for the largest lender A , x_A
$$x_A = (1/3)[v(ABC) - v(BC)] + (1/6)[v(AB) - v(B)]$$
$$+ (1/6)[v(AC) - v(C)] + (1/3)v(A)$$

Cooperative game (2):

Fukuda & Koibuchi (2006)

- (A1) $\alpha D > \beta D > \gamma D > X$
- (A2) $v(A) = \alpha L$, $v(B) = \beta L$, $v(C) = \gamma L$
- (A3) Only the largest lender A (Main-bank) bears private cost of $Z > 0$ when the project is liquidated (going bankrupt). $v(A) = \alpha L - Z$
- Sharpley value of x_A

$$x_A = (1/3)(X - L) + \alpha L - (2/3)Z \quad (1)$$

→ If Z is large, payoff for the largest lender A is small and then its burden of debt forgiveness is disproportionately large.

Traditional Main-bank-led corporate restructuring

- (1) The main-bank enduring the long-term relationship with client firms, i.e. having large Z , has strong incentive to lead the negotiation among lenders for protecting his reputation as a “sound main-bank” (Hoshi, Kashyap and Scharfstein, 1990, Sheard, 1994)
- (2) However, under the circumstances that regulatory capital requirement exists and bank capital were already impaired during the 1990s, the main-bank did not afford to bear such distortionally large burdens of debt forgiveness for their clients.

Role of the IRCJ: “Delegated negotiator”

- Under the IRCJ scheme, the IRCJ takes over the role of negotiator to coordinate the allocation of burdens of debt forgiveness.
- This is significant difference with the “Guideline for Private Liquidation” (私的整理のガイドライン) under which the main-bank has to pursue the role of negotiator to coordinate many lenders.
- IRCJ that is free from main-bank’s Z has a power to force new rule of proportional burdens of debt forgiveness to small lenders. So the IRCJ-support can greatly mitigate excess burdens of main-bank.

Delegation to the third party

- This is popular discussion for macroeconomics and corporate finance.
- Conservative central banker
 - The government delegates monetary policy to an independent “conservative” central banker (Rogoff, 1985).
- Incomplete contracting approach
 - Allocation of control right among players with different preference (e.g. Aghion & Bolton, 1992).

Main-bank share of burdens

Main-bank (MB) share of burdens
= Amount of MB burdens of debt forgiveness
/ Total amount of debt forgiveness

MB share of burdens = MB share of borrowing

⇔ Excess burdens of MB = 0 (“*pro rata*”)

MB share of burdens > MB share of borrowing

⇔ Excess burdens of MB > 0

MB share of burdens < MB share of borrowing

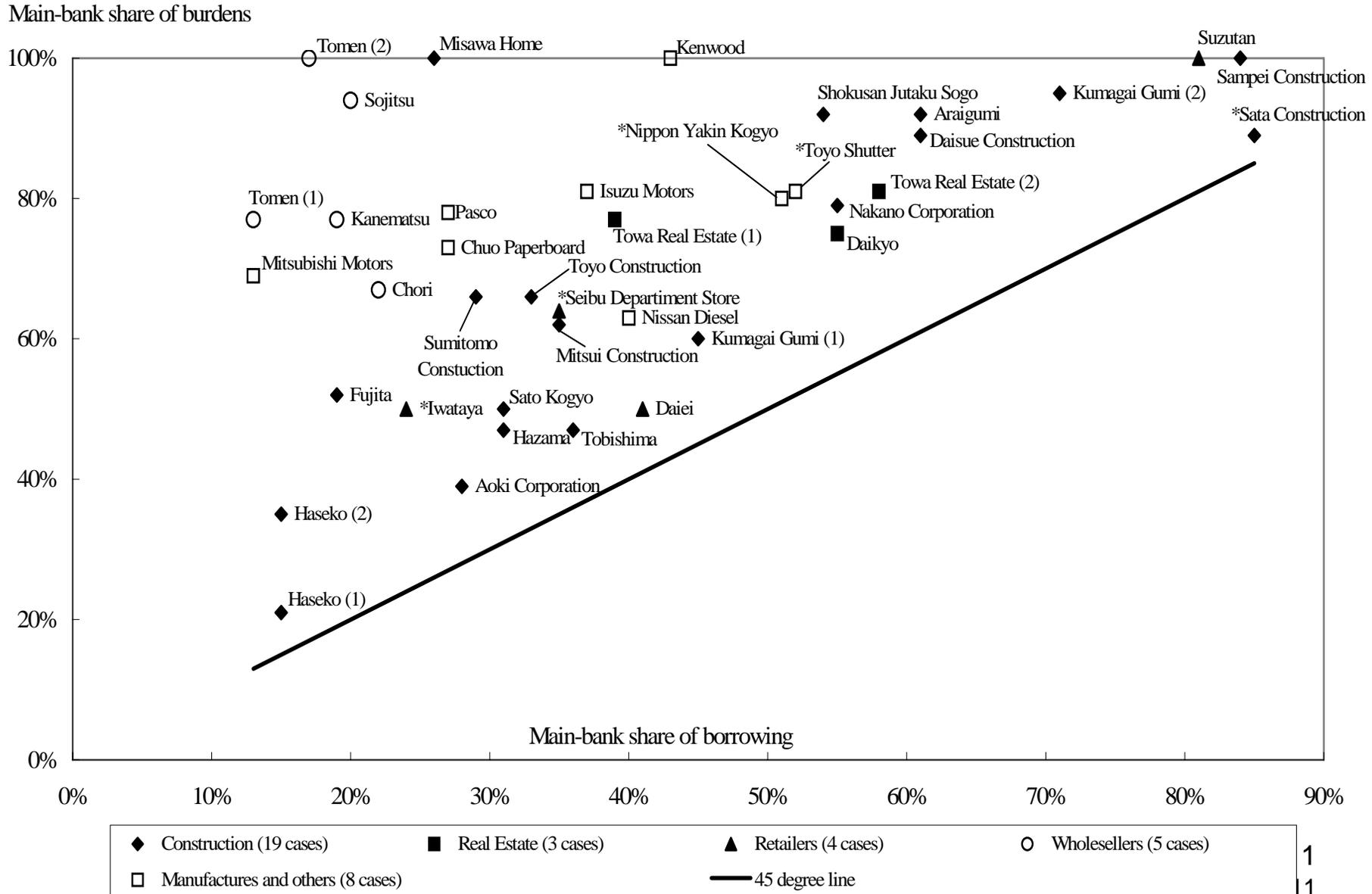
⇔ Excess burdens of MB < 0

Sample (1): the ordinary cases

- I pick up major cases of large listed companies that announced debt forgiveness (and/or debt-equity swaps) from 1998 to 2005.
- These are 39 cases related to 35 firms including 5 cases under the “Guideline for Private Liquidation” (私的整理のガイドライン).
- *22 cases for construction & real estate, 9 for wholesalers & retailers, and 8 for manufacturers.

Main-bank share of burdens: the ordinary cases

Figure 3: Main bank burdens in the ordinary cases



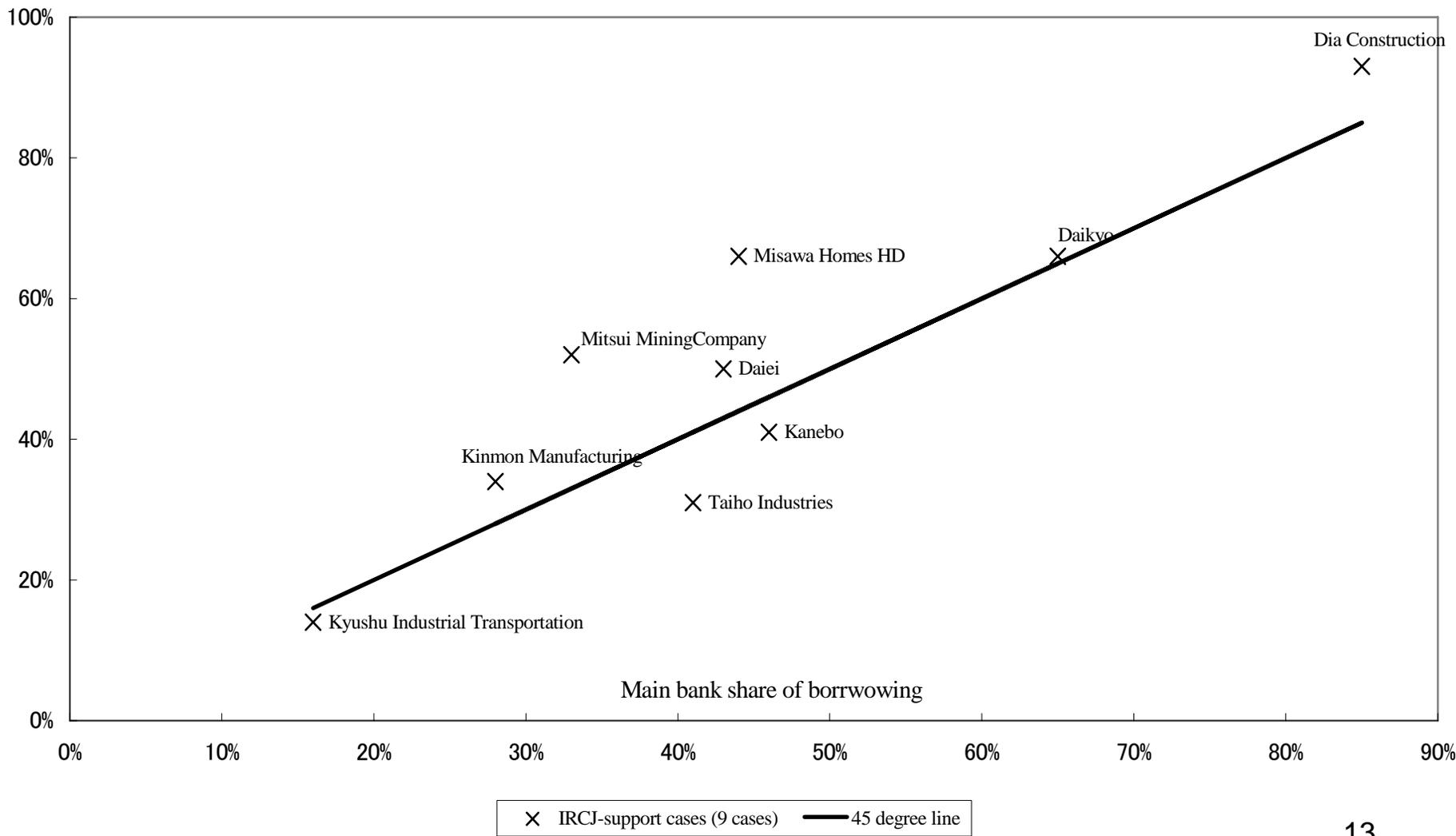
Sample (2): the IRCJ-support cases

- The IRCJ began its operation in May 2003 and supported 41 companies from Aug. 2003 to Dec. 2004.
- I focus on major 9 cases including Kyushu Industrial Transportation, Dia Kensetsu, Mitsui Mining, Kimmon Manufacturing, Kanebo, Taiho Industries, Daikyo, The Daiei, and Misawa Homes HD.

Main-bank share of burdens: the IRCJ-support cases

Figure 4: Main bank burdens in the IRCJ-support cases

Main bank share of burdens



Determinants of MB share of burdens

Dependent Variable: MB share of burdens

	The Ordinary Cases		The IRCJ-support Cases
	All cases	Guide Line cases	
constant	0.508*** (8.068)	0.422** (4.896)	0.039 (0.413)
MB share of borrowing	0.536*** (3.767)	0.617** (3.830)	1.026*** (5.235)
# of obs.	39	5	9

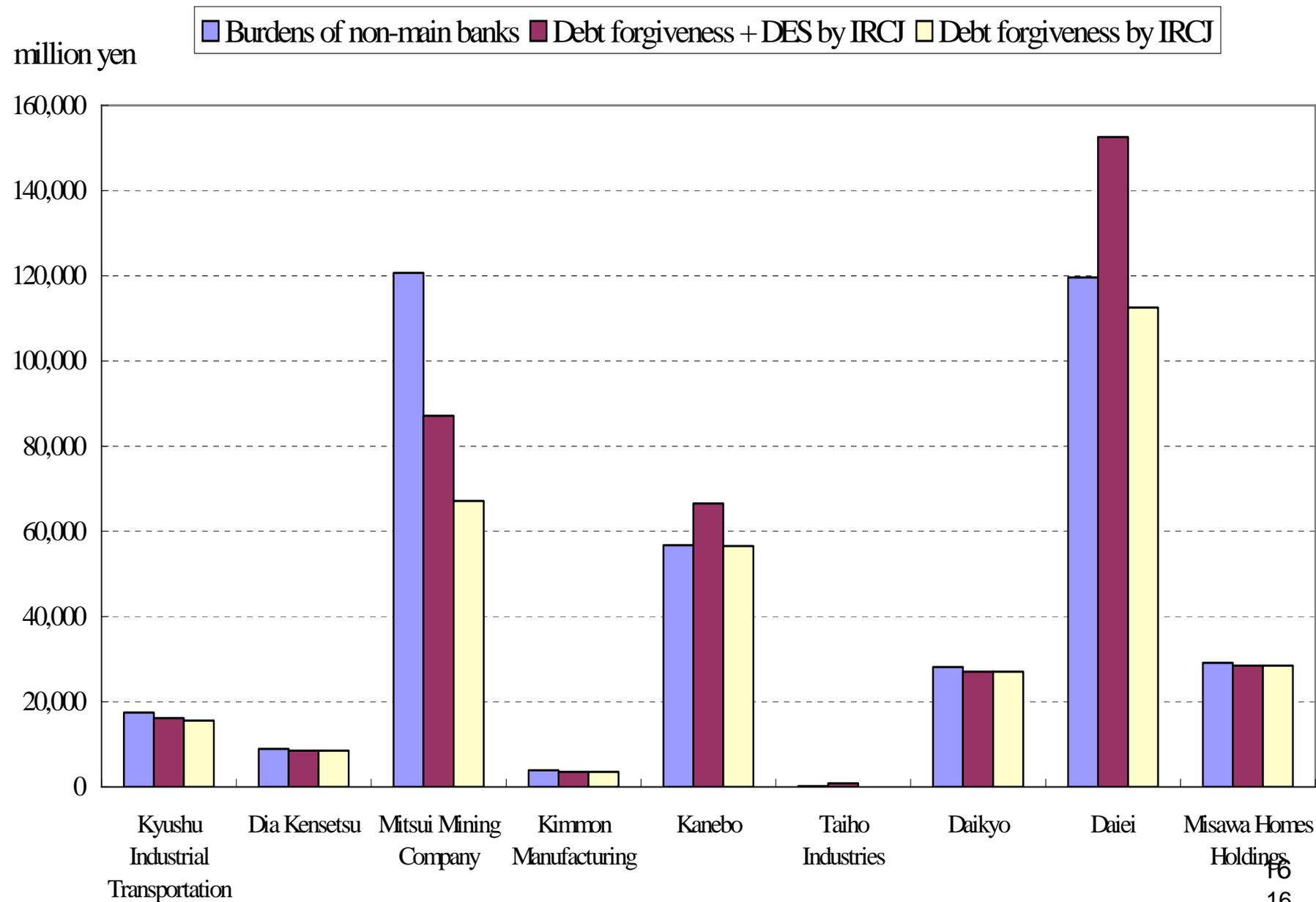
Note) t-value in parenthesis. *** for 1%, ** for 5%, * for 10%

Who bears burdens more?:

Two possibilities

- (1) The IRCJ substantially subsidize the company and its non-main lenders by fixing the price of debts for non-main lenders extremely high.
→ In this case, the IRCJ suffers from substantial ex post losses.
- (2) Small non-main lenders bears proportional burdens of debt forgiveness through the ‘appropriate purchasing price’ by the IRCJ.
→ In this case, the IRCJ does not suffer from any ex post losses.

Burdens on Non-main lenders and the IRCJ



Profit on sales from equity participation by the IRCJ

Unit: million yen	Equity Participation from IRCJ (DES)	Proceed from sales of share [Sponsor]	IRCJ's profit on sales (rate of returns)
Kyushu Ind. Transportation	700 (350)	3,194 [HIS]	2,494 (356%)
Mitsui Mining	20,000 (20,000)	27,437 [Nippon Steel]	7,437 (37%)
Kimmon Mfg.	3,000 (0)	4,650 [Yamatake Co.]	1,650 (55%)
Kanebo (Cosmetics)	236,000 (150,000)	263,401 [Kao]	27,401 (11%)
Taiho Ind.	850 (850)	1,631 [Ichinen Co.]	781 (92%)
The Daiei	50,000 (40,000)	69,800 [Marubeni Co.]	19,800 (40%)

Summary: Burdens of debt forgiveness

- Large excess burdens of main-bank are observed in the ordinary cases for large Japanese companies during 1998-2005.
- However, excess burdens of main-bank suddenly disappeared in the IRCJ-support cases.
- IRCJ bore no *ex post* losses through purchasing and selling debts of supported companies. IRCJ never subsidized supported companies and their lenders.
- The IRCJ greatly mitigated the main-bank's burdens of debt forgiveness by successfully introducing new rule for proportional allocation of burdens.
- ➔ The IRCJ-support could have large positive impacts on performance of Japanese banking sector and resolution of debt-overhang problem

Hypothesis:

Impacts on MB equity price (1)

- Under the circumstances that capitals for most of major Japanese banks are heavily impaired, given the excess burdens on the main-bank in the resolution of debt-overhang problem, market participants may perceive a request of debt forgiveness by a debt-ridden client as negative news on its main-bank valuation.
- In this case, we would observe significant negative impacts on equity price of main-bank when debt forgiveness announcement.

Hypothesis:

Impacts on MB equity price (2)

- If the company announces a request of debt forgiveness under the IRCJ-support, the IRCJ would apply the proportional burdens of debt forgiveness to all lenders, and excess burdens of main-banks would be greatly mitigated.
- Market participants perceive a request of debt forgiveness with support from the IRCJ as positive news on its main-bank's valuation.
- In this case, we would observe significant positive impacts on equity price of main-bank when debt forgiveness announcement.

Identifying event days

- (1) “First news report” on the request of debt forgiveness for the ordinary cases, and support from the IRCJ for the IRCJ-support cases.
 - The day when news report on possibility of debt forgiveness of the company with or without support from IRCJ was released to the market participants for the first time.
- (2) “Formal announcement of the plan” with or without support from the IRCJ
 - The day when the company formally announced its corporate revitalization plan including the request of debt forgiveness for its lenders. For the IRCJ-support cases, this is also the day when IRCJ formally announced the name of company to be supported.

Measuring Abnormal Returns of Main-bank equity price (1)

- Regressing the standard market model:

$$R_{ijt} = \alpha_{ij} + \beta_{ij} R_{mt} + \sum_e \sum_k \gamma_{ijk,e} D_{ik,e} + \varepsilon_{ijt} \quad (2)$$

R_{it} : Daily return of Main-bank i

R_{mt} : Daily return of TOPIX

e : event related to Main-bank i for firm j

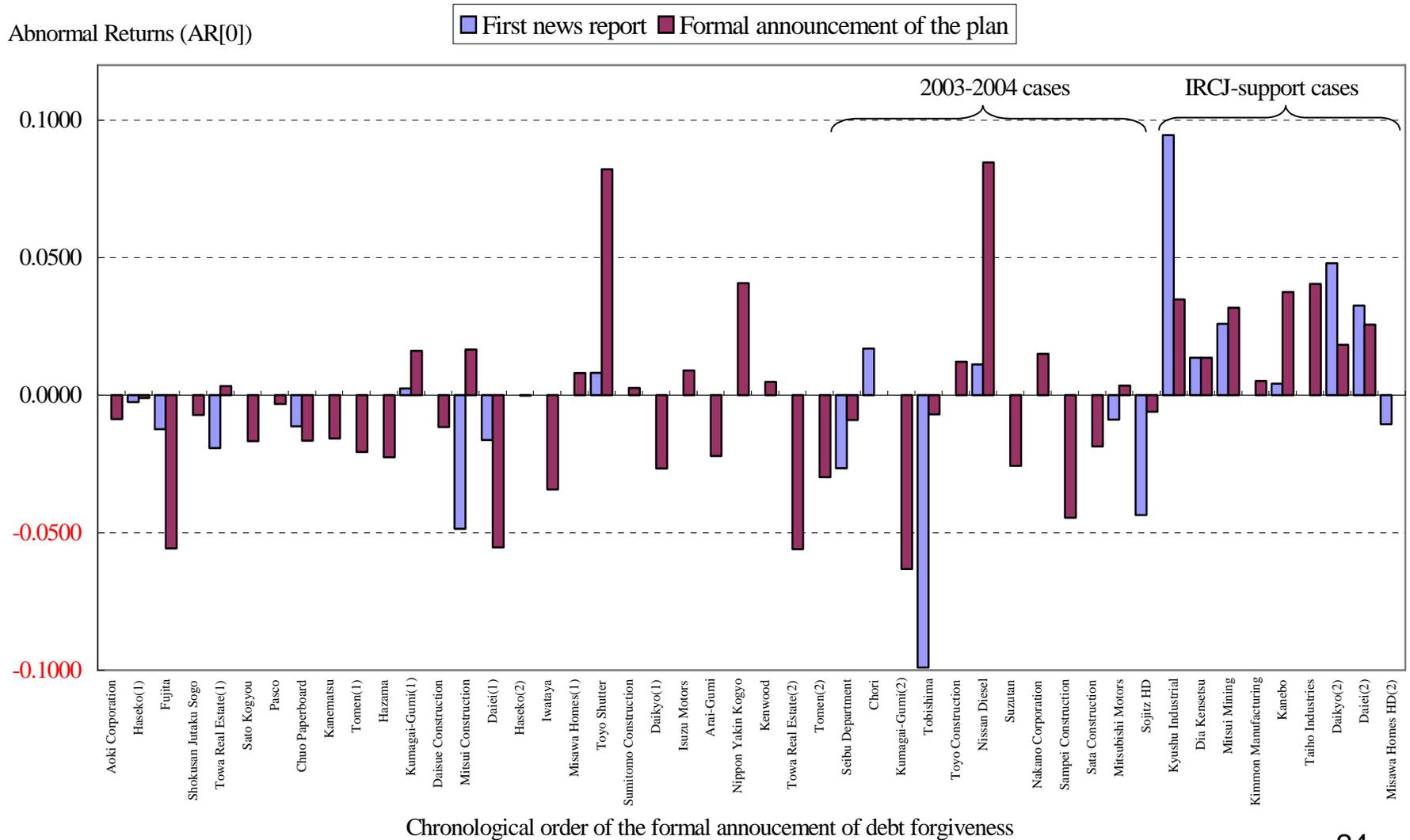
k : Event window, $[-1, +1]$

Measuring Abnormal Returns of Main-bank equity price (2)

- Estimation period includes 150 trading days before the first event day and 40 trading days after the second event day. (Ongena, et al., 2003, Brewer III, et al., 2003)
- Estimated coefficients, $\gamma_{ik,e}$, measure the daily abnormal returns, ARs, inside the event window.
- Single day abnormal return is $AR[0]$, and sum of $\gamma_{ik,e}$ over the multiple event windows yield cumulative abnormal returns, $CAR[-1,0]$ and $CAR[0,1]$.

Single day abnormal return, AR[0], for each case

Figure 5: Main bank's Abnormal returns at the event day of announcement of debt forgiveness



Simple mean test of each sample

- Simple mean test (MacKinley, 1997) to judge the significance of sample average under the assumption that the estimates are independent across events.
- Sample groups are “the IRCJ-support cases” and “the ordinary cases”.

Simple mean test: “IRCJ-support ” and “Ordinary” cases

Table 6: Average (cumulative) abnormal returns of main banks across events

(A) Average (C)ARs of main-banks across events (both of first news report and formal announcement of the plan)

	Number of Events	AR[0]	CAR[-1,0]	CAR[0,1]
IRCJ-support cases (9 cases)	15	0.027*** (0.000)	0.036*** (0.000)	0.033*** (0.019)
Ordinary cases (39 cases)	53	-0.009** (0.022)	-0.001 (0.864)	0.001 (0.805)
2003-2004 ordinary cases (12 cases)	18	-0.011 (0.218)	0.001 (0.946)	0.0190 (0.201)

(B) Average (C)ARs of main-banks across events (either first news report or formal announcement of the plan)

	Number of Events	AR[0]	CAR[-1,0]	CAR[0,1]
IRCJ-support cases (9 cases)	9	0.028** (0.026)	0.028** (0.022)	0.028 (0.179)
Ordinary cases (39 cases)	39	-0.014*** (0.000)	-0.007 (0.422)	-0.007 (0.247)

※ p-values are reported in parentheses. *** 1%, ** 5%, * 10%

Cross-sectional Regressions

- Regressing (C)AR of Main-bank i for firm j on characteristics of each case
- Estimated equation:

$$\begin{aligned}(\text{C})\text{AR}_{ij} = & \alpha + \beta (\text{Forgive/MBCAP})_{ij} \\ & + \gamma (\text{Firm(C)AR*ShareMV/MBCAP})_{ij} \\ & + \sigma_1 \text{Largest}_{ij} + \sigma_2 \text{Limit}_{ij} + \sigma_3 \text{President}_{ij} \\ & + \delta \text{IRCJ}_{ij}\end{aligned}$$

Sample summary (1): Direct impacts

(A) Debt forgiveness	IRCJ-support cases			Ordinary cases		
	Mean (Median)	Maximum (Minimum)	Std.Dev.	Mean (Median)	Maximum (Minimum)	Std.Dev.
Proportional Burdens of Debt Forgiveness / MB capitalization	0.0468 (0.0223)	0.2216 (0.0001)	0.0696	0.0393 (0.0154)	0.1758 (0.0012)	0.0523
(B) Firm's abnormal returns						
Firm AR[0] * Market value of firm equity holdings / MB capitalization	-0.0000 (0.0000)	0.0000 (-0.0001)	0.0000	0.0000 (0.0000)	0.0010 (-0.0017)	0.0003
Firm CAR[-1,0] * Market value of firm equity holdings / MB capitalization	-0.0000 (0.0000)	0.0000 (-0.0001)	0.0000	-0.0003 (0.0000)	0.0014 (-0.0133)	0.0021
Firm CAR[0,1] * Market value of firm equity holdings / MB capitalization	-0.0000 (0.0000)	0.0001 (-0.0002)	0.0000	-0.0007 (0.0000)	0.0007 (-0.0288)	0.0046

Sample summary (2): MB relationship

(C) Main bank relationship	IRCJ-support cases			Ordinary cases		
	Mean (Median)	# of cases	% to total	Mean (Median)	# of cases	Percent to total
% of equity held by MB	3.31 (4.19)	-	-	4.38 (4.79)	-	-
MB top equity holder among outsiders	-	5	56%	-	20	51%
MB equity holding at legal limit	-	2	22%	-	13	33%
MB representation on board	-	8	89%	-	36	92%
MB representation on President (or Chairman)	-	2	22%	-	11	28%

Cross-sectional regressions: All events

Dependent variable	AR[0]			CAR[-1,0]			CAR[0,1]		
Constant	0.001 (0.830)	-0.000 (0.903)	0.000 (0.997)	0.021* (0.067)	0.016* (0.087)	0.017 (0.115)	0.021* (0.054)	0.013 (0.147)	0.018* (0.087)
Proportional Share of debt forgiveness /MBCAP	-0.169** (0.014)	-0.146** (0.027)	-0.149** (0.027)	-0.272** (0.033)	-0.211* (0.080)	-0.213* (0.082)	-0.270** (0.025)	-0.223* (0.055)	-0.240** (0.042)
Firm (C)AR * ShareMV/ MBCAP	2.917 (0.798)	4.312 (0.700)	4.307 (0.702)	3.623 (0.364)	3.435 (0.382)	3.480 (0.381)	1.064 (0.551)	0.876 (0.627)	0.997 (0.582)
Largest shareholder	-0.010 (0.156)			-0.026* (0.061)			-0.019 (0.142)		
Legal limit			-0.001 (0.803)			-0.001 (0.893)			-0.013 (0.345)
President		-0.014* (0.076)	-0.014* (0.085)		-0.034** (0.022)	-0.034** (0.025)		-0.010 (0.489)	-0.008 (0.567)
IRCJ	0.041*** (0.000)	0.039*** (0.000)	0.039*** (0.000)	0.043*** (0.008)	0.037** (0.018)	0.037** (0.019)	0.036** (0.018)	0.033** (0.030)	0.033** (0.033)
Adj-R-sq.	0.257	0.271	0.315	0.113	0.137	0.124	0.090	0.065	0.064

⊗ p-values are reported in parentheses. *** 1%, ** 5%, * 10%

Cross-sectional regressions: Alternative samples

Sample Dependent variable	2003-2004 cases				first news report or formal announcement			
	AR[0]				AR[0]			
Constant term	0.003 (0.719)	-0.000 (0.969)	-0.000 (0.955)	0.002 (0.787)	-0.008 (0.224)	-0.007 (0.217)	-0.006 (0.211)	-0.005 (0.366)
Proportional share of debt forgiveness / MB capitalization	-0.230** (0.036)	-0.212** (0.041)	-0.193* (0.054)	-0.222** (0.030)	-0.148* (0.050)	-0.151** (0.043)	-0.144** (0.049)	-0.148** (0.046)
Firm AR * MB equity holdings / MB capitalization	22.748 (0.770)	37.245 (0.613)	37.724 (0.605)	19.255 (0.792)	13.903 (0.261)	13.975 (0.253)	14.079 (0.245)	13.882 (0.256)
Largest shareholder	-0.020 (0.121)				-0.001 (0.813)			
Legal limit		-0.025* (0.082)		-0.019 (0.181)		-0.005 (0.485)		-0.004 (0.619)
President			-0.027* (0.064)	-0.022 (0.141)			-0.009 (0.277)	-0.008 (0.336)
IRCJ	0.047*** (0.000)	0.046*** (0.000)	0.044*** (0.000)	0.047*** (0.000)	0.044*** (0.000)	0.044*** (0.000)	0.044*** (0.000)	0.043*** (0.000)
Adj-R-sq.	0.324	0.339	0.348	0.368	0.301	0.309	0.320	0.308

※ p-values are reported in parentheses. *** 1%, ** 5%, * 10%

Conclusion

- IRCJ successfully introduced new rule for proportional share of burdens among lenders.
- The IRCJ bore no *ex post* losses through purchasing and selling debts of supported companies. The IRCJ never subsidized supported companies and their lenders.
- Under the IRCJ scheme, debt forgiveness announcement had positive impact on the valuation of the main-banks.

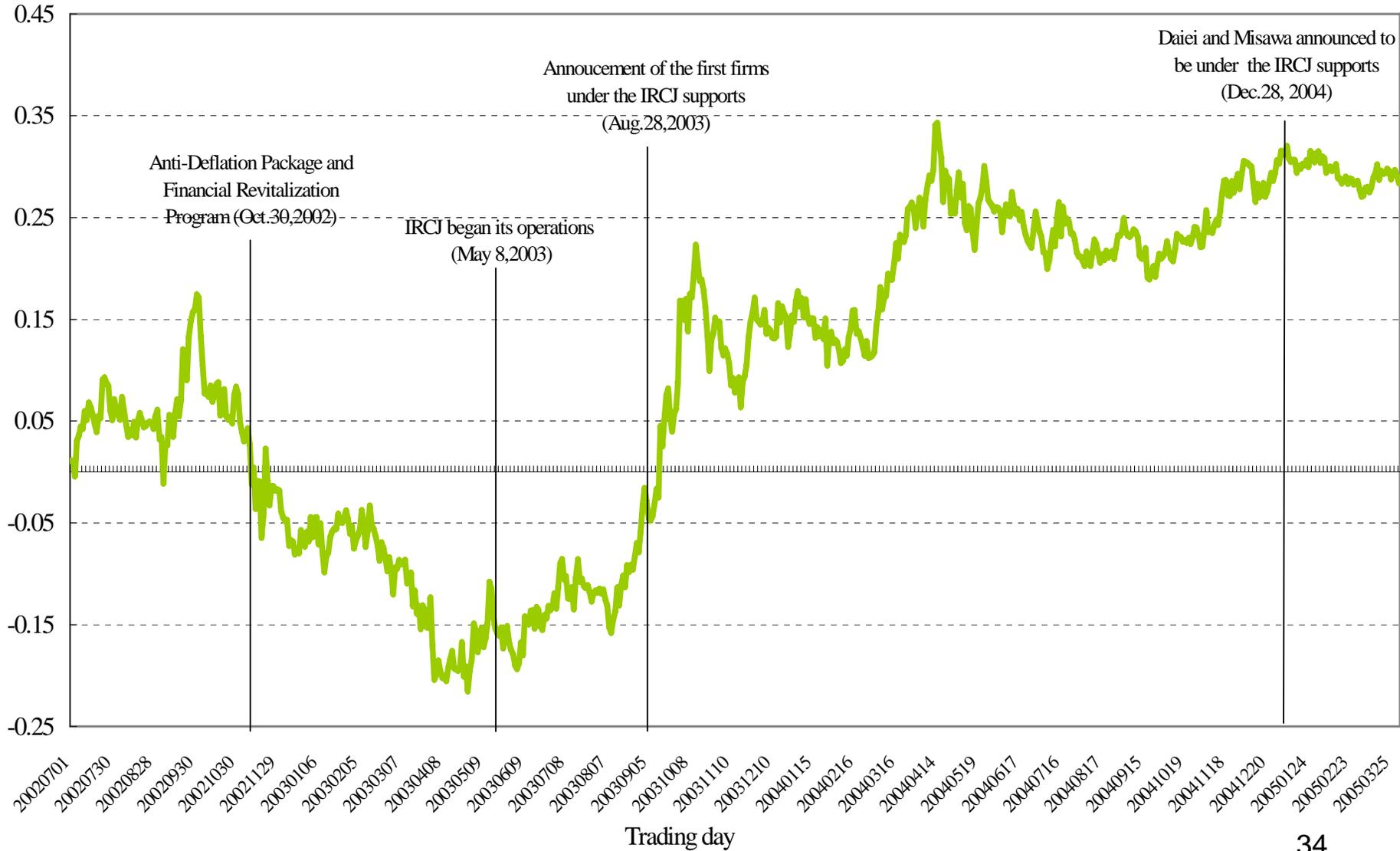
Implication

- Main-bank's excess burdens disappeared when IRCJ introduced new rule of proportional burdens of debt forgiveness.
- Under the IRCJ scheme, debt-overhang problem for the symbolic debt-ridden companies were resolved and performance of the Japanese banking sector were improved.
- Results strongly suggest that too large excess burden on the main-bank under the traditional Japanese main-bank system was an important contributor to prolonged NPL problem in Japan.

Figure 2: Cumulative Abnormal Returns of Japanese Banking Sector (From July 1, 2002 to March 31, 2005)

CAR (benchmark:TOPIX)

CAR of Topix Banks ETF (TSE, code:1615)



Further Research

- Sample bias in the IRCJ-support cases
- Stock price reaction of non-main lenders
- Assessment of the debt forgiveness in the Post-IRCJ era

Reduction of equity for the IRCJ-support firms

Kyushu Industrial Transportation	100% (Kyushu Sanko)
Dia Kensetsu	99%
Mitsui Mining Company	91.1%
Kimmon Manufacturing	90%
Kanebo	99.7%
Taiho Industries	95%
Daikyo	99.2%
The Daiei	99.6%
Misawa Homes HD	99%