



Financial supervision workshop 2018

“Supervisory enforcement actions and depositors’ reaction:
Monitoring, running, or living a quiet life?”

Presenter: Christos Tsoumas, Hellenic Open University

SUPERVISORY ENFORCEMENT ACTIONS AND DEPOSITORS' REACTION: MONITORING, RUNNING OR LIVING A QUIET LIFE?

Manthos D. Delis
Montpellier Business School

Panagiotis K. Staikouras
University of Piraeus and
Research Fellow – Institute of Global Law, Economics and Finance (IGLEF)
Queen Mary University of London

Chris Tsoumas
Hellenic Open University

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Main research question

- Pillars 2 and 3 of effective banking regulation and supervision rely on:
 - Market (depositor) discipline
 - Formal enforcement actions

- How do they relate?

- In detail:

How do depositors respond to the public disclosure of formal enforcement actions pertaining to banks' safety and soundness over and above the punished banks financial condition at the time the enforcement actions are announced?

Derivative questions - Extensions

- Extension of analysis in derivative fields, including:
 - ▣ Informational value of enforcement actions?
(e.g., Jordan et al., 2000; De Ceuster and Masschelein, 2003; Iyer et al., 2013)
 - ▣ Depositors' reaction to enforcement actions' announcement against the background of the punished banks' (*self reported*) financial condition?
 - ▣ Systemic implications enforcement actions may have on local banking markets (countries).

Conceptual framework

- Depositors' reaction to formal enforcement actions can be grouped in three broad categories / competing hypotheses pertaining to depositor monitoring:
 - A. Indifference - “depositor unresponsiveness” hypothesis
 - Plausible explanations:
 - Related information has been already disclosed or leaked before regulatory action
 - ❖ No informational content in enforcement actions
- and / or
- Perception that deposit insurance scheme provides efficient safety net for depositors' funds.

Conceptual framework (cont'd)

- B. Heightened concerns leading to runs - “depositor run” hypothesis
- ▣ Formal enforcement actions are typically used as the supervisor’s last resort after informal actions, thus:
 - ▣ Interpretation of enforcement actions as signals that the bank passed the “point of no return” - bank failure is forthcoming
- C. Indication of change in bank’s financial condition – “measured depositor monitoring” hypothesis
- ▣ Withdrawal of deposits in protracted and unrushed fashion
- Which of the above three hypotheses dominates?


What we don't do

- We do not:
 - ▣ Examine “depositor influence”:
 - The punished banks’ management response to deposit withdrawals in order to counteract adverse changes in the banks’ condition (Bliss and Flannery 2001)
 - Except for the deposit rate
 - ▣ Extract inferences on the quality or effectiveness of banking enforcement policy
 - Lack of data for possible supervisory discretion (e.g. (i) delay publishing an enforcement action for a reasonable time or (ii) abstain from publishing an enforcement action).

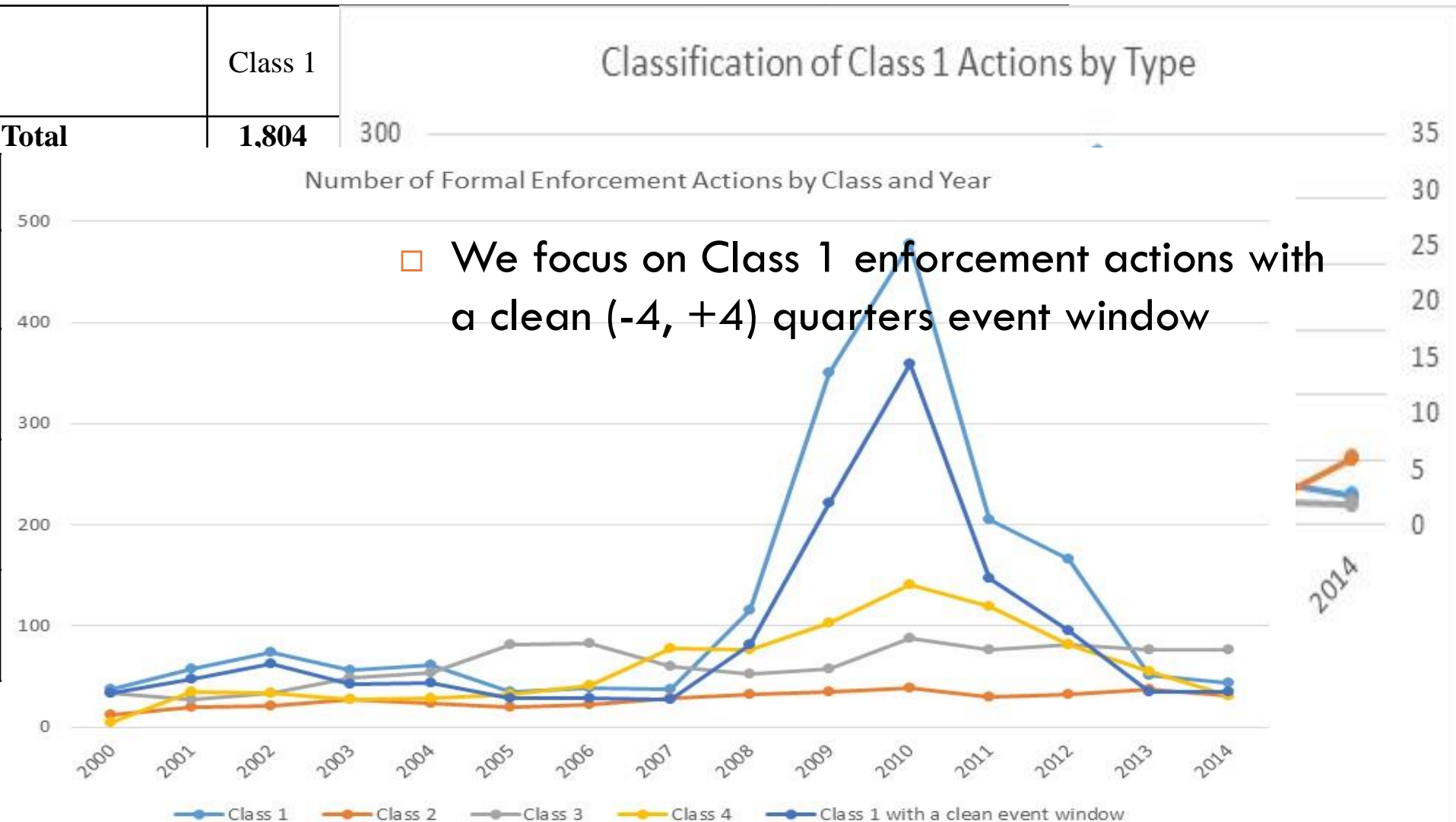
Data description

- Two main sources:
 - Bank-quarter data from the FFIEC 031/041 Call Reports
 - Branch-level data from Summary of Deposits files
 - All formal enforcement actions from the FRB, FDIC, and OCC websites classified on a one-by-one basis according to their relevance for banks' safety and soundness
- Sample period: 2000Q1 – 2014Q4

Classification of enforcement actions on a one-by-one basis

Relevance for banks' safety and soundness	Class	Reasons
	Class 1	Capital adequacy and liquidity, asset quality, provisions and reserves, large exposures and exposures to related parties
	Class 2	Internal control and audit systems, money laundering, bank secrecy, consumer protection and foreign assets control
	Class 3	Breaches of the requirements concerning the fitness and propriety of banks' board members and senior management
	Class 4	Typical infringements of specific laws (e.g., Home Mortgage Disclosure Act, Flood Insurance Act, Flood Disaster Protection Act, etc)

Formal enforcement actions in our sample



Dependent variables

- (log) Uninsured deposits (calculated following Berger and Turk-Ariss (2015))
 - Depositors more inclined to “punish” banks with increased risk-taking/default probability by withdrawing their deposits or/and by demanding higher interest rates
(e.g., Calomiris and Mason, 1997; Park and Peristiani, 1998; Iyer and Puri, 2012; Acharya and Mora, 2015)
- (log) Insured deposits
 - Deposit insurance erodes the monitoring incentives of insured depositors
(e.g., Demirgüç-Kunt and Huizinga, 2004; Hadad et al., 2011; Karas et al., 2013; Berger and Turk-Ariss, 2015)
- (log) Total deposits
 - (log) Branch-level total deposits
- Deposit rate
- Also, core deposits, brokered deposits and other deposits (sum of domestic deposits of the U.S. Government, States and Political Subdivisions in the U.S., commercial banks in the U.S. and all other deposits in foreign offices).

Econometric specification

- Diff – in – Diff model, estimated with OLS:

$$d_{i,t+4} - d_{i,t} = a_0 + a_1(d_{i,t} - d_{i,t-4}) + a_2EA_{it} + a_3(x_{i,t} - x_{i,t-4}) + \beta_i + \gamma_t + u_{it}$$

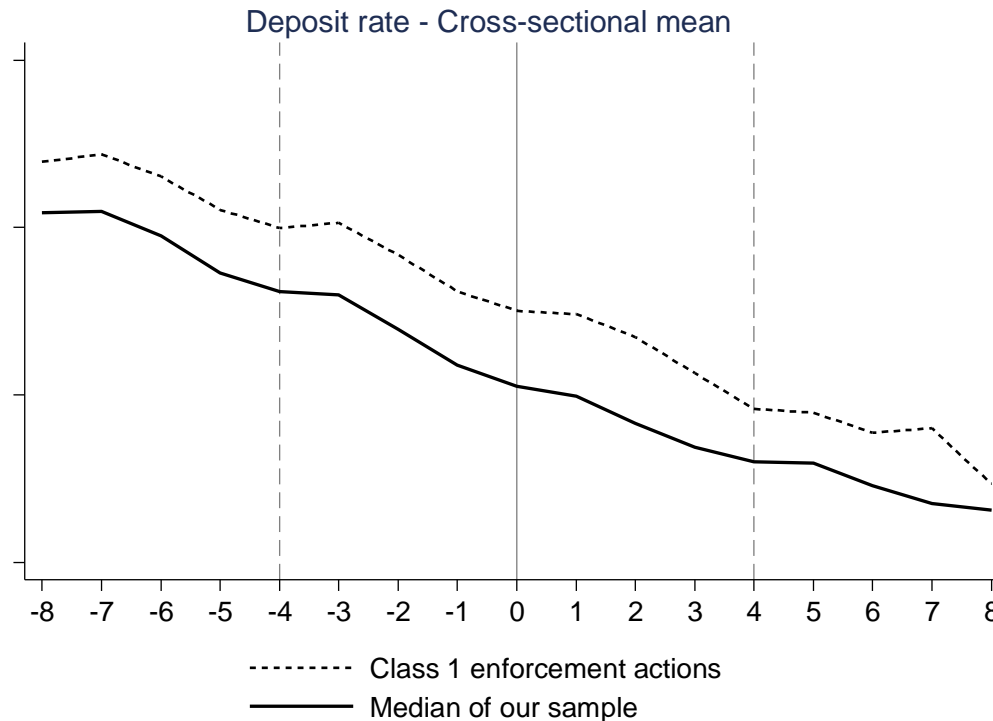
- EA is a binary variable taking the value 1 in the quarter of the enforcement action and 0 otherwise
- The vector x includes a set of bank-specific control variables affecting deposits
 - ▣ Risk-based capital ratio; bank profitability (ROA); standard deviation of ROA (σ ROA); non-performing loans ratio; liquidity ratio; non-interest income ratio
- Bank and time fixed effects included
- Coefficient of interest a_2 :
 - Compares the change in (log) deposits of treated (punished) bank-quarters (treated group) with the change in (log) deposits of other non-punished bank-quarters (control group).

Identification challenge

□ Challenge: actions to depositors

□ Endogenous enforcement actions to depositors
estimate

➤ For depositors, the announcement of enforcement actions may have a reaction



enforcement

used OLS

may have

announcement

reaction

□ Parallel trends: An initial indication that depositors, on average, seem to react only to the announcement of the enforcement action and not to the financial condition of the punished bank pre-enforcement.

Identification challenge (cont'd)

□ Yet, possible endogeneity issues:

1. The dynamics of punished banks' poor financial condition and supervisory intervention might be correlated
2. Fundamental differences between the reaction of insured and uninsured depositors due to deposit insurance scheme
3. We need to control for other banks in the control group that should have been punished but were not.

Identification challenge (cont'd)

- Thus, we also estimate a treatment effects model:

$$EA_{it} = b_0 + b_1 z_{it} + b_2 (x'_{i,t} - x'_{i,t-4}) + e_{it}$$

$$d_{i,t+4} - d_{i,t} = a_0 + a_1 (d_{i,t} - d_{i,t-4}) + a_2 \widehat{EA}_{it} + a_3 (x_{i,t} - x_{i,t-4}) + \beta_i + \gamma_t + u_{it}$$

- Instrument z:
 - ▣ A vector of bank examiners' characteristics in local supervisory offices (gender, salary, tenure, number) - *available only for FDIC and OCC*
- Plus a full set of controls reflecting banks' financial condition (e.g., profitability, capital, credit risk, liquidity)
 - ▣ + the lobbying status of banks (following Lambert (2018))
- Test the equality of coefficients of interest between the two models:
- Equality would make the Diff – in Diff OLS estimates trustworthy and establish causality.

Results

“Depositor unresponsiveness” hypothesis rejected

Comparison of IV and OLS results for FDIC and OCC banks

	Panel A: OLS				Panel B: Treatment effects model			
	I	II	III	IV	V	VI	VII	VIII
Dependent Variable (Change from t to $t+4$):	Δ Uninsured Deposits	Δ Insured Deposits	Δ Total Deposits	Δ Deposit Rate	Δ Uninsured Deposits	Δ Insured Deposits	Δ Total Deposits	Δ Deposit Rate
Class 1 Enforcement action t	-0.155*** (-9.32)	-0.071*** (-17.08)	-0.083*** (-21.26)	-0.0004*** (-4.50)	-0.141*** (-5.66)	-0.076*** (-14.72)	-0.085*** (-16.69)	-0.0004*** (-3.25)
					First Stage Probit			
Examiners' gender t					0.563*** (2.89)	0.564*** (2.89)	0.563*** (2.89)	0.562*** (2.89)
Examiners' salary					0.825*** (12.63)	0.824*** (12.60)	0.824*** (12.61)	0.824*** (12.62)
Examiners' tenure					-0.548*** (-9.79)	-0.547*** (-9.77)	-0.547*** (-9.78)	-0.547*** (-9.79)
Number of examiners					-0.025* (-1.83)	-0.025* (-1.83)	-0.025* (-1.83)	-0.025* (-1.83)
Lobbying status							0.2*** (53)	-0.614*** (-2.64)
Adj. R-squared								
Number of banks	8,087	8,087	8,087	8,087	8,087	8,087	8,087	8,087
Observations	317,457	317,457	317,457	317,457	317,457	317,457	317,457	317,457

The presence of endogeneity is rejected at conventional levels of statistical significance

Testing the Equality of the Class 1 Enforcement Action Coefficients

across the Two Specifications

Column I vs Column V	0.55 (0.46)	Column III vs Column VII	0.20 (0.66)
Column II vs Column VI	2.07 (0.15)	Column IV vs Column VIII	0.07 (0.79)

Results – Yearly Changes

Larger impact for uninsured deposits

Total deposits are approximately 8.4% lower post-enforcement relative to control group's deposits

Baseline Results – All banks

Dependent Variable:	Δ Uninsured Deposits	Δ Insured Deposits	Δ Total Deposits	Δ Deposit Rate
Class 1 Enforcement Action t	-0.163***	-0.076***	-0.088***	-0.0005***
Adj. R-squared	0.199	No economically significant impact on punished banks' deposit rate		0.770
Number of Banks	9,040			9,052
Observations	365,634			367,075

Core, Brokered and Other Deposits

Dependent Variable:	Δ Core Deposits	Δ Brokered Deposits	Δ Other Deposits
Class 1 Enforcement Action t	-0.057***	-0.340***	-0.168***
Adj. R-squared	0.221	Largest decrease for brokered deposits	
Number of Banks	9,024		
Observations	364,689		

Core deposits are approx. 5.54% lower

Shorter-term analysis of depositors' reaction

- During the quarter *immediately* following the imposition of the enforcement action

Quarterly Changes			
Dependent Variable:	Δ Uninsured Deposits	Δ Insured Deposits	Δ Total Deposits
Class 1 Enforcement Action t	-0.091***	-0.026***	-0.036***
Adj. R-squared	0.083	0.104	0.058
Number of Banks	9,658	9,675	9,674
Observations	414,315	415,779	415,878

Quarterly Changes			
Dependent Variable:	Δ Core Deposits	Δ Brokered Deposits	Δ Other Deposits
Class 1 Enforcement Action t	-0.018***	-0.136***	-0.061***

- No evidence in favor of the “depositor run” hypothesis
- In sum, evidence for informational content of enforcement action
 - consistent with Jordan et al. (2000); De Ceuster and Masschelein (2003); Iyer et al. (2013)

Different types of class 1 enforcement actions

Larger impact of Prompt Corrective Actions for all deposit categories

Different Types of Class 1 Enforcement Actions

Yearly Changes

Dependent Variable:	Δ Uninsured Deposits	Δ Insured Deposits	Δ total Deposits
Cease and Desist Orders $_t$	-0.184***	-0.086***	-0.096***
Prompt Corrective Actions $_t$	-0.458**	-0.139***	-0.148***
Formal Agreements/Consent Orders $_t$	-0.133***	-0.064***	-0.079***

Quarterly Changes

Dependent Variable:	Δ Uninsured Deposits	Δ Insured Deposits	Δ Total Deposits
Cease and Desist Orders $_t$	-0.095***	-0.028***	-0.039***
Prompt Corrective Actions $_t$	-0.286**	-0.046***	-0.060***
Formal Agreements/Consent Orders $_t$	-0.072***	-0.022***	-0.033***

Depositors' response to enforcement actions against the punished banks' (*self-reported*) fundamentals

Sensitivity Analysis According to Bank Fundamentals

	Panel A. According to Risk-Based Capital Ratio		
Dependent Variable:	Δ Uninsured Deposits	Δ Insured Deposits	Δ Total Deposits
	Lower Quartile		
Class 1 Enforcement Action $_t$	-0.112***	-0.048***	-0.057***
	Upper Quartile		
Class 1 Enforcement Action $_t$	-0.236***	-0.099***	-0.116***

- Enforcement action as a bad surprise
- Triggers a more intense depositor reaction

Especially when non-performing loans ratio is considered

The effect of enforcement actions on the local banking market - Branch-level analysis

A small, positive effect on non-punished neighboring bank branches' deposits which might be related *inter alia* to the deposit outflow from the punished bank

Branch-Level Analysis – Yearly Changes

	Δ Branch Deposits
	-0.064***
Non-Punished Neighbor Branches t	0.008***
Adj. R-squared	0.048
Number of Branches	136,524
Observations	1,021,342

Depositors response despite the regional characteristics of the punished bank's branch network

Conclusions

- Results consistent with the “measured depositor monitoring” hypothesis
 - Deposit decline commences shortly, i.e., within the first quarter after the announcement of class 1 enforcement action
- Class 1 formal enforcement actions do encompass and communicate valuable information
 - Stir depositors’ “informational sensitivity” albeit with heterogeneous outcomes
- The decline in insured deposits is considerably less, but not negligible, compared to uninsured deposits
 - Deposit insurance may have a moderating effect on depositors’ incentives to withdraw their funds



Thank you for your attention!

Depositors' response over different time periods

Sensitivity Analysis Over Different Time Periods

Dependent Variable:	Δ Uninsured Deposits	Δ Insured Deposits	Δ Total Deposits
Class 1 Enforcement Action t	-0.180***	-0.084***	-0.098***
Class 1 Enforcement Action t x Crisis A	-0.012	0.010	0.000
Class 1 Enforcement Action t x Crisis B	-0.017	0.001	0.004
Class 1 Enforcement Action t x Post-Crisis	0.065*	0.017	0.025**

- Crisis A: 2007Q3-2008Q3
- Crisis B: 2008Q4 - 2010Q2
- Post-Crisis 2010Q3-2015Q4

Including Class 2, 3, and 4 Enforcement Actions

Dependent Variable:	Δ Uninsured Deposits	Δ Insured Deposits	Δ Total Deposits
Class 1 Enforcement Action $_t$	-0.163***	-0.076***	-0.088***
Class 2 Enforcement Action $_t$	-0.046	-0.033***	-0.030***
Class 3 Enforcement Action $_t$	0.011	-0.008*	-0.007
Class 4 Enforcement Action $_t$	-0.021	-0.004	-0.006*
Adj. R-squared	0.199	0.246	0.209
Number of Banks	9,040	9,052	9,052
Observations	365,634	366,904	367,011

Including Enforcement Actions on Bank Holding Companies

Including Enforcement Actions on Bank Holding Companies

Dependent Variable:	Δ Uninsured Deposits	Δ Insured Deposits	Δ Total Deposits
Class 1 Enforcement Action $_t$	-0.163***	-0.076***	-0.088***
Class 1 Enforcement Action on BHCs $_t$	-0.036	-0.036**	-0.034*
Adj. R-squared	0.199	0.246	0.209
Number of Banks	9,040	9,052	9,052
Observations	365,634	366,904	367,011