Twenty-first

Conference on Research on Economic Theory and Econometrics

Ursuline School of Naxos July 10-14, 2023

Colluding or Settling? The role of unilateral overlapping ownership

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This work has been partly supported by the University of Piraeus Research Center

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3. Overlapping ownership
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Introduction to the Settlement Procedure

- The Settlement Procedure (SP)
  - ✓ Introduced by the European Commission (EC) in June 2008
  - ✓ Concerns cases where undertakings make a clear and unequivocal acknowledgement of participation and liability in relation to their participation in horizontal agreements (cartels)
  - ✓ Its objective is not to replace the standard enforcement procedure for cartel cases
  - ✓ Instead, it aims at simplifying and speeding up the handling of pending cases, as well as reducing the number of appeals against the decisions of Competition Authorities (CAs) before administrative courts
- What's the incentive for firms to settle with CAs?
  - ✓ If CAs decide to reward cartel participants for their cooperation during the SP, the final amount of the imposed cartel fine is reduced (usually by 10%)

Effectiveness of the Settlement Procedure

- Competition Authorities envision to induce the participation of all cartel firms in the SP
  - ✓ This allows a better allocation of resources, in order to deal with more cases, thereby increasing the deterrence effect of their enforcement actions
  - ✓ Hence, it is said that the SP is effective when inducing all cartel firms to settle with CAs (the non-hybrid SP)
  - ✓ If only some of the undertakings settle with CAs, then the hybrid SP arises
- The challenging question
  - ✓ How does the existence of unilateral overlapping ownership affect the incentives of firms to settle or to collude?

Overlapping ownership

- We consider two types of overlapping ownership (OO)
- Following the definition of OO given by de Haas & Paha (RIO, 2021), Heim et al. (AEJ: Microeconomics, 2022), Lopez & Vives (JPE, 2019), and Stenbacka & van Moer (IJIO, 2023):
  - ✓ Partial common ownership (CNO) exists when institutional investors hold stakes in competing firms, thereby influence their corporate strategy
  - ✓ Partial cross ownerships (CRO) is present when firms acquire rival firms' stakes in the form of investments with no control rights, thus disregarding the impact of their actions on other firms' corporate strategy

Settlement Procedure & Leniency Program in practice

- Highest cartel fines per case: 2001 – 2022 (29.11.2022)

S/N	Year	Cases	Fine in €	Leniency Program	Settlement Procedure	
					Hybrid	**Not Hybrid**
1	2016/2017	Trucks (**T**)	**3 807 022 000**	4 applicants	5 out of 6 firms	
2	2019/2019/ 2021	Forex (*three-way Banana Split*) (**TWBS**) (*Essex Express*) (**EE**) (*Sterling Lands*) (**SL**)	1.329.980.000 **811.197.000** **257.682 000** **261 101 000**	5 applicants 3 applicants 4 applicants	13 out of 14 firms	
3	2012	TV and Computer Monitor Tubes (TVCMT) **CPT** CARTEL **CDT** CARTEL	1.490.615.000 **328.187.000** **1.162.428.000**	3 (out of 4) applicants 5 (out of 8) applicants	-	-
4	2013/2016/ 2021	Euro Interest Rates Derivatives (**EIRD**)	**1.308.172.000**	4 applicants	4 out of 7 firms	
5	2014	Automotive Bearings (**AB**)	**953 306 000**	5 applicants		All (6 firms)
6	2021	Car emissions (**CE**)	**875 189 000**	2 applicants		All (3 firms)
7	2007	Elevators and escalators (**E&E**) BELGIUM GERMANY LUXEMBOURG THE NETHERLANDS	**992 312 000** 185.620.050 617.091.750 49.361.400 140.239.000	 4 (out of 4) applicants 4 (out of 4) applicants 4 (out of 4) applicants 3 (out of 5) applicants	-	-
8	2010/2017	Airfreight (air cargo carriers) (**ACC**)	**1.215.215.000**	10 (out of 13) applicants	-	-
9	2001	Vitamins (**V**)	**855.230.000**	9 (out of 13) applicants	-	-
10	2013/2015	Yen Interest Rate Derivatives (**YIRD**)	**689.859.000**	5 applicants	6 out of 7 firms	-
		TOTAL IMPOSED FINES	**13.496.900.200**			

Ownerships in the banking industry

BARCLAYS *Shareholders (Capital %)*	RBS *Shareholders (Capital %)*
Qatar Investment Authority (6,54) Credit Suisse Asset Management (5,52) Dodge & Cox (3,98) Black Rock Investment Management (3,64) The Vanguard Group (3,13) Black Rock Fund Advisors (2,74) Black Rock Advisors (UK) Ltd. (1,43)	HM Treasury (38,5) Norges Bank Investment Management (3,38) MFS International (UK) Ltd. (1,95) The Vanguard Group, Inc. (1,77) Massachusetts Financial Services Co. (1,69) Black Rock Investment Management (UK) Ltd. (1,5
UBS *Shareholders (Capital %)*	**CITIGROUP** *Shareholders (Capital %)*
Black Rock Inc. (4,97) Massachusetts Financial Services Co. (3,17) Artisan Partners Limited Partnership (3,03) Dodge & Cox International Stock Fund (3,02) Norges Bank (3,01) The Vanguard Group, Inc. (2,08) Credit Suisse Asset Management (Schweiz) AG (2,06)	The Vanguard Group, Inc. (8,29) SSgA Funds Management, Inc. (4,25) Berkshire Hathaway, Inc. (2,84) BlackRock Fund Advisors (2,30) Geode Capital Management LLC (1,81) Capital Research & Management Co. (1,19) Massachusetts Financial Services Co. (1,17)
JP MORGAN *Shareholders (Capital %)*	**HSBC** *Shareholders (Capital %)*
The Vanguard Group, Inc. (8,93) SsgA Funds Management, Inc. (4,23) BlackRock Fund Advisors (2,16) Geode Capital Management LLC (1,78) Capital Research & Management Co (1,39) Capital Research & Management Co. (1,38)	Ping An Asset Management Co., Ltd. (8,29) Black Rock Investment Management (3,86) The Vanguard Group, Inc. (3,38) Norges Bank Investment Management (2,99) BlackRock Fund Advisors (2,63) BlackRock Advisors (UK) Ltd. (1,35)

DEUTSCHE BANK *Shareholders (Capital %)*	SOCIETE GENERALE *Shareholders (Capital %)*
Capital Research & Management Co. (5,74) Hamad Al-Thani (4,59) Hudson Executive Capital LC (3,3) The Vanguard Group, Inc. (2,6) Norges Bank Investment Management (2,23) Amundi Asset Management US, Inc. (2,2)** Goldman Sachs International (1,72)	Amundi Asset Management SA (4,41)** Société Générale Société anonyme (2,75) The Vanguard Group, Inc. (2,5) Caisse Des Dépôts & Consignations (2,31) BNP Paribas Asset Management France SAS (2,05) Capital Research & Management Co. (1,85) UBS Fund Management (Ireland) Ltd. (1,77) Black Rock Investment Management (UK) (1,59)
CREDIT AGRICOLE *Shareholders (Capital %)*	**CREDIT SUISSE GROUP** *Shareholders (Capital %)*
SAS Rue la Boétie (57,1) Crédit Agricole SA Employee Stock Ownership Plan (6 BNP Paribas Asset Management France SAS (1,13) The Vanguard Group, Inc. (1,1) Dodge & Cox (0,97)	Saudi National Bank (9,88) Qatar Holding LLC (5,03) Olayan Group (4,93) Black Rock, Inc. (2,82)
MUFG INC *Shareholders (Capital %)*	
Mitsubishi UFJ Financial Group, Inc. (4,94) Nomura Asset Management Co., Ltd. (3,5) Black Rock Fund Advisors (3) The Vanguard Group, Inc (2,49)	

Ownerships in the truck manufacturing industry

MAN *Shareholders (Capital %)*	**SCANIA** *Shareholders (Capital %)*
VW (TRATON) (100)	VW (TRATON) (100)
VOLVO *Shareholders (Capital %)*	**DAMLER** *Shareholders (Capital %)*
Swedbank Robur Fonder AB (5,44) Shu Fu Li (4,96) Alecta Pension Insurance Mutual (3,07) SEB Investment Management AB (2,99) Handelsbanken Fonder AB (2,85) Norges Bank Investment Manage (2,67) The Vanguard Group, Inc. (1,81)	Mercendes – Benz Group AG** (30,01) BAIC Group*** (6,49) Mercendes Benz Pension Trust e.V (4,99) Kuwait Investment Authority (4,98) Institutional Investors (38,36) Retail Investors (15,17)
DAF *Shareholders (Capital %)*	**IVECO** *Shareholders (Capital %)*
The Vanguard Group, Inc. (11,4) SsgA Funds Management, Inc. (4,09) Capital Research & Management Co. (3,43) Geode Capital Management LLC (2,25) Black Rock Fund Advisors (2,13) Massachusetts Financial Services Co. (1,66)	Exor NV (Private Equity) (27,1) Norges Bank Investment Manage (8,18) Harris Associates LP (6,43) Southpoint Capital Advisors LP (4,22) Acadian Asset Management LLC (3,99) The Vanguard Group, Inc. (2,2)

Evidence from the hybrid settled cartel cases

- Firms reported in the truck manufacturing industry have engaged in 1 hybrid settled cartel case
  - ✓ T Case AT.39824 –Trucks
- Firms reported in the banking industry have engaged in the remaining 3 hybrid settled cartel cases
  - ✓ TWBS Case AT.40135 Forex (Three Way Banana Split)
  - ✓ EE Case AT.40135 Forex (Essex Express)
  - ✓ SL Case AT.40135 Forex (Sterling Lads)
  - ✓ EIRD Case AT.39914 - Euro Interest Rate Derivatives
  - ✓ YIRD Case AT.39861 – Yen Interest Rate Derivatives
- Conclusion: *CNO is more closely linked to hybrid settled cases*

Ownerships in the SCR systems industry

VW GROUP *Shareholders (Capital %)*	**BMW** *Shareholders (Capital %)*
Amundi Asset Management SA** (3,17) The Vanguard Group, Inc. (2,64) Porsche Automobil Holding SE (1,27) Free Floating (42,3) Qatar Investment Authority (Investment Company) (1,2) Capital Research & Management Co. (1,19)	Stefan Quand (25,8) Susanne Klatten (20,9) Bayerische Motoren Werke (3) Flossbach von Storch AG (1,66) The Vanguard Group, Inc. (1,45) Amundi Asset Management SA** (0,97)
DAMLER *Shareholders (Capital %)*	
Mercendes - Benz Group AG*** (30,01) BAIC Group**** (6,49) Mercendes Benz Pension Trust e.V (4,99) Kuwait Investment Authority (4,98) Institutional Investors (38,36) Retail Investors (15,17) Mercendes - Benz Group AG** (30,01)	

Ownerships in the bearing manufacturing industry

JTEKT GROUP *Shareholders (Capital %)*	NSK GROUP *Shareholders (Capital %)*
Toyota Motor Corporation** (22,5) Nomura Asset Management (6,85) DENSO Corporation (5,35) Nippon Life Insurance Co. (3,24) Toyota Industries Corporation (2,28) Sumitomo Mitsui Trust Holdings, Inc. (2,22) Nikko Asset Management Co., Ltd. (2,15) Daiwa Asset Management Co. Ltd. (2,07)	NSK Ltd. (5,44) Meiji Yasuda Life Insurance Co. (5,01) Fukoku Mutual Life Insurance Co (4,06) Nippon Life Insurance Co. (4) Nomura Asset Management Co., Ltd. (3,89) Mizuho Financial Group, Inc. (3,29) Nikko Asset Management Co., Ltd. (3,25) Sumitomo Mitsui Trust (2,8) The Vanguard Group, Inc. (2,1) Toyota Motor Corp. Pension Fund (1,94)
NFC GROUP *Shareholders (Capital %)*	**SKF GROUP** *Shareholders (Capital %)*
Nachi Wanei Stockholding (9,98) Nachi-Fujikoshi Employee Stock Ownership Plan (5,91) Nachi-Fujikoshi Corp. (5,87) Mitsubishi UFJ Financial Group, Inc. (3,71) Nachi Torihikiten Business Association (3,62) Hokuhoku Financial Group, Inc. (3,47) Nippon Life Insurance Co. (3,18)	FAM AB (15) Cevian Capital (7,9) Harris Associates (5,2) Vanguard (3,1) Livförsäkringsbolaget Skandia (0,7) Black Rock (2,8) SEB-Stiftelsen (0,4)
NTN GROUP *Shareholders (Capital %)*	**SCHAEFFLER GROUP** *Shareholders (Capital %)*
Nomura Asset Management Co., Ltd. (5,06) Mitsubishi UFJ Financial Group, Inc. (4,41) Meiji Yasuda Life Insurance Co. (4,22) Dimensional Fund Advisors LP (3,32) NTN Kyoeikai Business Association (3,12) Dai-ichi Life Holdings, Inc. (3,06)	BDT & MSD Partners (25) Union Investment Privatfonds GmbH (8,28) Schroder Investment Management Ltd (4,52) Norges Bank Investment Management (2,74) JPMorgan Asset Management (UK) Ltd. (2,17) The Vanguard Group, Inc. (1,29)

Evidence from the non-hybrid settled cartel cases

- Firms reported in the bearings for automotive applications manufacturing industry have engaged in 1 non-hybrid settled cartel case
  - ✓ AB Case COMP/39922 – Automotive Bearings
- Firms reported in the SCR systems for diesel passenger cars industry have engaged in the remaining one non-hybrid settled cartel case
  - ✓ CE Case AT.40178 – Car Emissions
- Conclusion: *CRO is more closely linked to non-hybrid settled cases*

Our paper… in a nutshell

- **Our goal:** To challenge the empirical evidence that CNO is more likely to lead to hybrid settled cases, whereas CRO is more closely related to non-hybrid settled cases
- **Our strategy:** To study the effect of CNO and CRO on firms' incentives to settle or to collude
- **Our means:** A simplified model with two cost asymmetric competing firms
- **Our assumption:** Unilateral overlapping ownership
- **Our main finding:** The objective of CAs to induce all cartel firms to settle is more likely to arise in equilibrium under cross-shareholding than under common ownership
- The main finding well serves our goal ⇒ Policy implications are drawn

The model

- Two firms $i = 1,2$ competing à la Cournot, face the inverse demand function $P = 1 - Q$, where $Q = q_1 + q_2$
- They produce a homogenous final good at a cost $w_i \frac{c(q_i)^2}{2}$ with $w_1 = 1$ and $w_2 \equiv w \in [0,1]$
- Therefore, the two firms are cost symmetric when $w = 1$; otherwise, firm 2 is the efficient firm and firm 1 is the inefficient one
- Let $\mu_i \in [0,0.5)$ denote the share of firm i in firm $j's$ equity capital, hence $\mu_j = 0$, with $i, j = 1,2$ and $i \neq j$
- Each firm may: (i) reach a collusive agreement with its rival, thus both acting as a cartel monopolist; or (ii) settle with the CA to benefit from the percentage reduction on the cartel fine due to SP

Cartel formation

- We assume that cartel firms allocate output quotas like a multiplant monopolist allocating outputs between two plants (Patinkin, QJE, 1947)

- The goal of the monopolist is to maximize the following profit function:

$$\pi_M = (TR - TC) - \rho(\kappa P_M Q_M)$$

where $\rho \in [0,1]$ denotes the probability that the cartel would be detected, and the cartel fine is defined as a percentage (κ) of its revenue ($P_M Q_M$) realized once the cartel is detected

- To simplify the calculus, we adopt the EC's practice, according to which the cartel fine is limited to 10% of its overall revenue, thus $\kappa = 0.1$

- Equilibrium outputs are: $q^*_{i,M} = \dfrac{w}{w_i} \cdot \dfrac{5(1 - 0.1\rho)}{(10 - \rho)(1 + w) + 5wc}$

Settlement with partial overlapping ownership (1/2)

- We follow de Haas and Paha (RIO, 2020) for modeling overlapping ownership
- The firm posing an overlapping ownership in its rival seeks to maximize:

$$\pi_{i,S} = \left(P_S q_{i,S} - w_i \frac{c(q_{i,S})^2}{2}\right) + \mu_i \left(P_S q_{j,S} - w_j \frac{c(q_{j,S})^2}{2}\right) - (1-\chi)\kappa\left(P_M q_{i,M}\right)$$

- The target firm, which does not hold any overlapping ownership in its rival, aims to maximize:

$$\pi_{j,S} = \left(P_S q_{j,S} - w_j \frac{c(q_{j,S})^2}{2}\right) \frac{(1-\mu_i)}{DV} - (1-\chi)\kappa\left(P_M q_{j,M}\right)$$

- DV is a dummy variable: CNO $\rightarrow 1$ / CRO $\rightarrow (1-\mu_i)$
- $\chi \in [0,1]$ reflects the percentage reduction on the cartel fine due to settling

Settlement with partial overlapping ownership (2/2)

- Equilibrium outputs are (for $\kappa = 0.1$):

$$q_{i,S}^* = \frac{(1-\mu_i)+c\frac{w}{w_i}}{(3-\mu_i)+[wc^2+2c(1+w)]} \text{ and } q_{j,S}^* = \frac{1+c\frac{w}{w_j}}{(3-\mu_i)+[wc^2+2c(1+w)]}$$

- The results are consistent with the related literature as summarized by Li and Shuai (JRE, 2022)
  - ✓ The firm increasing its overlapping ownership chooses to decrease its output
  - ✓ The target firm chooses to increase its output
  - ✓ Total output is lower, thus overlapping ownership softens competition

Colluding or Settling

- Substituting equilibrium outputs in profit functions yields equilibrium profits
- Each firm compares its profit when colluding and settling
- For the controlled firm

$$\Delta\pi_i^{CNO} = \pi_{i,S}^{CNO*} - \pi_{i,M}^{CNO*} \text{ or } \Delta\pi_i^{CRO} = \pi_{i,S}^{CRO*} - \pi_{i,M}^{CRO*}$$

- For the target firm

$$\Delta\pi_j^{CNO} = \pi_{j,S}^{CNO*} - \pi_{j,M}^{CNO*} \text{ or } \Delta\pi_j^{CRO} = \pi_{j,S}^{CRO*} - \pi_{j,M}^{CRO*}$$

- We calculate the first derivative of the above profit difference functions with respect to the CNO and CRO shares of firm i in firm j

The role of overlapping ownership

- Under unilateral common ownership:

$$\frac{\partial \Delta \pi_i^{CNO}}{\partial \mu_i} = \frac{\left(1 + c\frac{w}{w_j}\right)[(4 + c(2 + w + wc)(5 + 2c - \mu_i + wc(2 + c)]}{2[(3 - \mu_i) + [wc^2 + 2c(1 + w)]^3} > 0$$

$$\frac{\partial \Delta \pi_j^{CNO}}{\partial \mu_i} = -\frac{\left(1 + c\frac{w}{w_j}\right)^2 \left(2 + c\frac{w}{w_i}\right)[(1 + 2c + \mu_i + wc(2 + c)]}{2[(3 - \mu_i) + [wc^2 + 2c(1 + w)]^3} < 0$$

- Under unilateral cross ownership:

$$\frac{\partial \Delta \pi_i^{CRO}}{\partial \mu_i} = \frac{\partial \Delta \pi_i^{CNO}}{\partial \mu_i} > 0 \quad \text{and} \quad \frac{\partial \Delta \pi_j^{CRO}}{\partial \mu_i} = \frac{\left(1 + c\frac{w}{w_j}\right)^2 \left(2 + c\frac{w}{w_i}\right)}{[(3 - \mu_i) + [wc^2 + 2c(1 + w)]^3} > 0$$

The role of overlapping ownership: Findings

- Regardless of whether the efficient or the inefficient firm increases its cross-holding level, both firms are provided with higher incentives to enter the settlement procedure
- When the reference shareholder of either firm increases its minority shares in the other, the controlled firm faces higher incentives to settle, as opposed to the target firm which increases its preference for collusion
- Partial cross ownership is more probable to lead to non-hybrid settled cases, as opposed to partial common ownership which is found to be more closely related to hybrid settled cases
- The latter has been supported by empirical evidence regarding the settled cases with the highest cartel fines in Europe

Conclusions

- The objective of CAs to induce all cartel firms to settle, hence leading to non-hybrid settled cases, is more likely to arise in equilibrium under cross-shareholding
- Such partial overlapping ownership agreements could enhance the effectiveness of the settlement procedure, as opposed to their negative impact on competition under a Leniency Program
- Common ownership affects each firm's incentives to settle in a completely different way, thus leading to hybrid settled cases, hence undermines the effectiveness of settlement procedure
- CAs should be very careful when dealing with the competition effects of common ownership agreements
- Bilateral overlapping ownership does not change the results qualitatively

Q & A

Thank you

for your attention

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