Naughty Firms, Noisy Disclosure

Effects of Cartel Enforcement on Corporate Disclosure

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A refresher on collusion

- Two types of collusion in product markets
  - Explicit collusion requires direct private communication to coordinate
  - Tacit collusion / coordination does not require such communication
- Both types of collusive practices allow firms to exert market power
  - Artificially restrict competition and increase prices
  - Reduce welfare (in particular consumers' surplus)
- Collusion is illegal and regulators are trying to curb price-fixing activities around the world, yet cartels are pervasive
  - Total sales of 1,014 suspected cartels between 1990 and 2013 represent \$1.5tr (Connor, 2014)

Big picture trade-off

- Financial markets regulations have been strengthening over time
  - Firms are required to be more transparent
  - Expected benefits include reduced information asymmetry
    - Less adverse selection $\rightarrow$ liquidity, cost of capital
    - Allow investors to monitor, discipline, and reward managers
- There might also be some costs associated with transparency if mandated disclosure allows firms to tacitly coordinate in product markets
  - Regulatory concern by the OECD (2012)

    Greater transparency in the market is generally efficiency enhancing and, as such, welcome by competition agencies. However, it can also produce anticompetitive effects by facilitating collusion or providing firms with focal points around which to align their behaviour

This paper

- Research question: Do firms use their disclosure in financial statements to share information that could benefit peers in tacit collusion arrangements?
- Empirical strategy
  - Assumption: When explicit collusion costs increase, tacit collusion becomes more appealing
  - Identification: Strengthening antitrust enforcement around the world that affects U.S. firms
- Policy takeaway: Highlight conflict between securities and antitrust regulations

Objectives

- Research objectives
  1. Construct a properly specified empirical model capturing changes in explicit collusion costs
  2. Use the model to test whether an increase in explicit collusion costs affects firms' strategic disclosure behavior
- Empirical challenges
  1. Identification of explicit collusion costs
  2. Identification of disclosure options that could facilitate tacit collusion

Identification of explicit collusion costs

- Like any form of crime, collusive arrangements are not observable to the econometricians
- Solution: use detected cartels?
  - No, because of multiple endogeneity concerns
- Solution: rely on the adoption of leniency laws (LL) around the world
  - Grant immunity to the first self-reporting cartel member, and allow for reduced sentences to cooperative cartel members
  - Number of convicted cartels increased by 154% and gross margins dropped by 14.8% (Dong, Massa, and Žaldokas (2015))

More on leniency laws

- First adoption in the U.S. in 1973, became effective starting in 1993
- Staggered adoption by 63 countries around the world until 2012 with no particular trends
  - United States, Switzerland, Hungary: laws passed after significant collusion cases
  - Taiwan: concerns about rising consumer prices
  - Mexico: general recommendation of an OECD Peers Review
  - Singapore: U.S. bargained to add it as part of FTA
  - Some EU member states: pressure from the EU
  - IMF and World Bank sometimes ask for the overhaul of antritrust laws as part of funding

Identification strategy

- We focus on U.S. incorporated firms between 1994 and 2012 and look at the staggered passage of laws in the countries with which the firm's industry trades
  - Passage of foreign leniency laws makes the coordination between the antitrust authorities easier
  - Firms that could consider colluding in multiple foreign markets might find it more difficult to form international cartels with industry peers
  - Exogenous to the economic conditions surrounding the firm in the U.S.

Continuous treatment variable

- Proxy firm's exposure to the passage of foreign leniency laws by firm's industry imports
- Estimate a weighted average of foreign laws:

$$Foreign\ Leniency_{jt} = \sum_{k} w_{kj} L_{kt}$$

where w_j is the share of two-digit SIC industry j's imports from country k to U.S. in 1990 and L_{kt} is an indicator variable that takes a value of 1 if country k has passed a leniency law by year t

- Variation at a country/industry/year level
  - When Spain passed the law in 2008, Foreign Leniency increased by x% for U.S. industries that import x% from Spain

Empirical specification

$$Disclosure_{ijt} = \beta_0 + \beta_1 Foreign\ Leniency_{jt} + \theta X_{ijt} + \kappa Z_{jt} + \alpha_i + \gamma_t + \epsilon_{ijt}$$

$\rightarrow \beta_1$ is essentially a D-i-D estimate

- Treated industries in year t:
  - Trade *more* with countries that pass leniency law in year t
- Control industries in year t:
  - Trade *less* with countries that pass leniency law in year t

Validation (Table 2)

	Convicted Cartels	*Convicted Firms*	*Gross Margin*	*Sales*
	(1)	(2)	(3)	(4)
Foreign Leniency	1.315**	2.596**	-0.503*	-0.843**
	(0.569)	(1.135)	(0.266)	(0.324)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	No	No
Firm FE	No	No	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	378	378	26,095	26,095
Adj. R-squared	0.206	0.159	0.709	0.949

Main disclosure variable

- We focus on new material contracts regarding customers
  - Regulation S-K requires firms to file all material contracts or agreements through 8-K or 10-K filings
  - Credible forward-looking measures about prices/quantities
- However, due to proprietary reasons, the SEC allows firms to request part of the information to be withheld from the filings $\rightarrow$ Firms have discretion
  - Strategic disclosure documented by Verrechia and Weber (2006)
- We create measures to capture whether firms redact information
  - Search for confidential requests
  - Dummy and continuous measures of redacted contracts per firm-year

Material contracts with customers (Table 3)

	Redacted Contracts		*%Redacted Contracts*	
	(1)	(2)	(3)	(4)
Foreign Leniency	-4.876***	-4.888***	-4.658***	-4.637***
	(1.317)	(1.077)	(1.196)	(0.928)
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
Observations	414	414	414	414
Adj. R-squared	0.619	0.616	0.647	0.647

- Focusing on the most exposed industries, each adoption of leniency law explains, on average, 19% of within-firm variance

Heterogeneity

- Maturity
  - Collusion is harder to sustain in periods of high demand because in such periods the deviation gain is the highest
  - Mature industries, measured by industry sales growth
- Differentiation
  - In repeated games, the ability to collude on quantity or price is affected by products' differentiation
  - Hoberg and Philips (2010)
- HHI Census
  - Collusion is easier to sustain with fewer players
  - Census based measure of industry concentration

Heterogeneity (Table 4)

	Redacted Contracts		
	(1)	(2)	(3)
Foreign Leniency	-4.223***	-5.923***	-3.206***
	(0.794)	(1.194)	(0.573)
Maturity (A)	0.114		
	(0.099)		
A#Foreign Leniency	-2.450**		
	(1.046)		
Differentiation (B)		-0.258*	
		(0.118)	
B#Foreign Leniency		2.473**	
		(1.051)	
HHI Census (C)			0.001**
			(0.000)
C#Foreign Leniency			-0.002*
			(0.001)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	414	354	402
Adj. R-squared	0.628	0.602	0.614

Other robustness tests

1. State trends (state-year fixed effects)
2. Weights based on
   - 3-digit SIC codes
   - Export shares
   - Final good imports only
   - 3-digit SIC - 2-digit SIC shares
3. Binary foreign law, based on the most exposed country
   - Matching where control group is comprised by the other 3-digit SIC industries that are within the same 2-digit SIC industry group but not as exposed
4. Placebo tests, anticipating the laws by 4 years
5. Clustering at firm or industry level

Alternative measures (1)

1. Information about major customers
   - Firms must disclose the identity and the amount of sales for customers that represent more than 10% of their annual revenues
   - Firms however often omit customers' names (Ellis et al., 2012)
   - We construct a measure that captures the proportion of redacted customers' names
2. Conference calls
   - Concentrate on the presentation by CEOs and CFOs
   - We construct a measure that captures how much managers disclose product-market related issues
     - Count of product-market related words including price, product, customer, clients

Alternative measures (2)

- FTC File No 051 0008 against Valassis:

  FTC alleged that, during a public earnings conference call, the CEO of Valassis announced a new strategy for raising prices. The company knew that its rival, News America, would be monitoring the call. The FTC alleged that Valassis intended to facilitate collusion through its announcement. Moreover, it alleged that there was no legitimate business reason for Valassis to disclose its new pricing strategy.

- FTC File No 081 0157 against U-Haul:
  - *FTC alleged that U-Haul had announced on an investor conference call that it recently had increased its rates and had encouraged its main competitor to do the same, while warning that it would drop its rates if its competitor did not match them within a specific period of time. FTC reached a consent decree with U-Haul that prohibited future efforts to use communications of this type to raise or stabilize prices or otherwise to coordinate with other companies on pricing.*

Other product-related disclosure (Table 6)

	%Redacted Customers		*%Product Conference Calls*	
	(1)	(2)	(3)	(4)
Foreign Leniency	-0.250*	-0.300**	8.219*	9.588*
	(0.134)	(0.130)	(4.696)	(4.647)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
Observations	17,677	17,677	9,429	9,429
Adj. R-squared	0.538	0.540	0.687	0.687

- Less redaction of customer identities and more talk on product market strategies during conference calls

Does it work?

- So far, our evidence suggests that an increase in explicit collusion costs leads firms to disclose more product market related information, that could potentially be used to coordinate in a tacit collusion situation
- Do we find any evidence that the change in disclosure is economically consistent with a switch to tacit collusion?
- Create a partition based on whether or not firms redacted fewer customer identities and compare the trends in profitability
  - Cautious interpretation required: association test

Profit margins

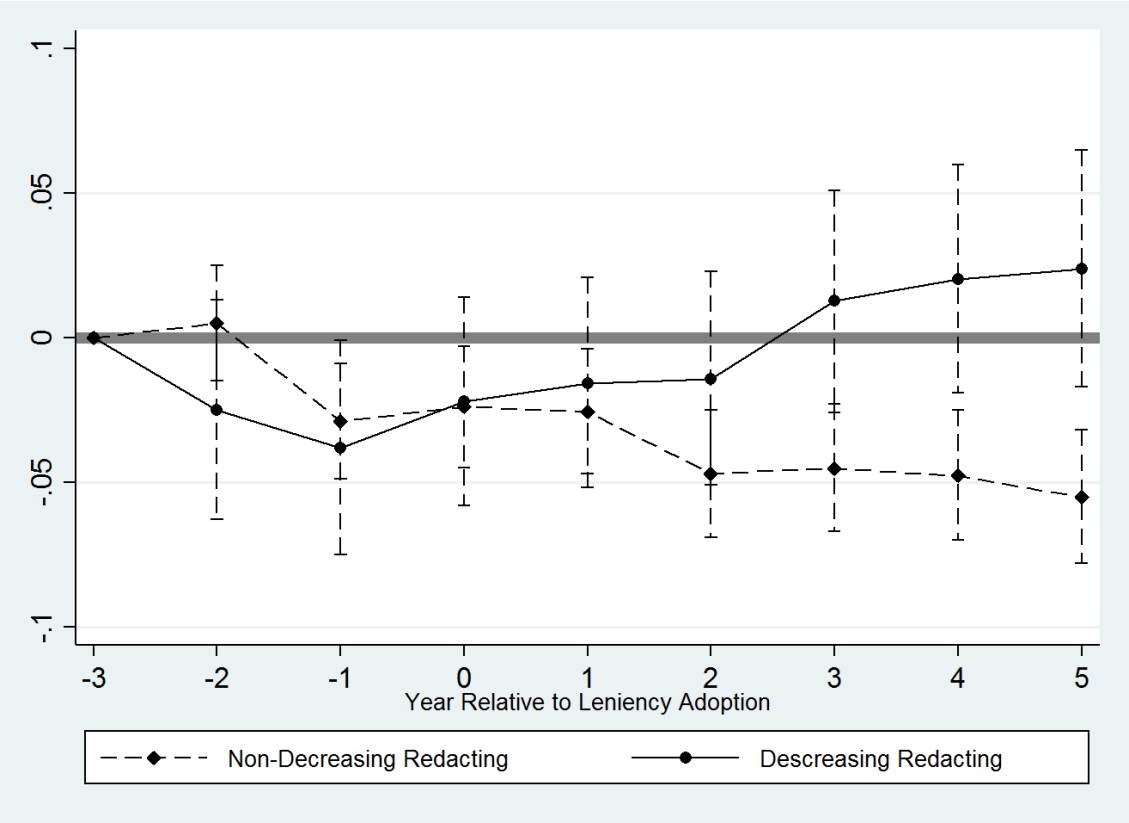

Figure 1: Redacting Disclosure and Profit Margins Around Leniency Laws

Alternative explanation: Capital raising for expansion

- The change in disclosure might be driven by capital-markets incentives (Dasgupta and Žaldokas (2016)) and be unrelated to product market concerns
- Firms' profitability positively depend on its industry peers disclosure ...
- Firms reduce disclosure that is valuable to investors and antitrust bodies but not to competitors ...
  - Regulators access firms' filings more when it becomes easier to prosecute cartels ...
  - Past aggregate discussion about competition is associated with antitrust enforcement actions ...

Takeaways

- Increase in explicit collusion costs leads to a strategic change in firms' disclosure on product market related information
  - Consistent with financial disclosure being used as a coordination mechanism to sustain tacit collusion
  - Firms sharing more information do not experience a drop in profitability
- Policy implications highlight the conflict between securities and antitrust regulations
  - Optimal disclosure level should take into account the effect of financial transparency on consumers' welfare

Appendix

Literature on product market and disclosure

- Vast literature on disclosure and product markets (Beyer et al., 2010)
  - More competition $\rightarrow$ less disclosure (proprietary costs)
  - More competition $\rightarrow$ more (negative) disclosure to deter entry
- This paper: When facing an unexpected increase in collusion costs (more competition from existing players) $\rightarrow$ improved disclosure to attenuate competition and reach a tacit coordination equilibrium

Literature on mandated transparency

- Mandated transparency should incentivize desirable behaviour
  - Increased mandated disclosure in various areas including consumer protection, food hygiene, social responsibility, health care, etc...
- Mandated transparency of prices has mixed effects on firms
  - Two competitive forces: discipline through customers monitoring versus coordination / collusion
    - Burgeoning literature using data from ready-mixed concrete, supermarkets, gasoline prices, airline tickets
- This paper: Financial statements transparency and its negative consequences on collusion at the expense of consumer welfare

Literature on information exchange in product markets

- Extensive theoretical literature in IO on firms sharing information
  - Kuhn and Vives (1995) on collusion
- Empirical historical literature focused on trade associations where firms voluntarily share information on price and quantities
  - Example: Genesove and Mullin (2001) in the sugar industry
- This paper: Financial disclosure as a new coordination mechanism
  - Mandatory disclosure requirements but with discretion to share more or less information that can be used to coordinate with industry peers
  - Mandatory component solves the theoretical "cheap talk" concern (Baliga and Morris, 2002)

Peer disclosure and gross profit margins (Table A4)

	Gross Margin	
	(1)	(2)
Foreign Leniency	-0.492	-0.454*
	(0.305)	(0.255)
Less Redacting (A)	-0.036*	-0.036**
	(0.017)	(0.017)
A×Foreign Leniency	0.740**	0.741**
	(0.337)	(0.320)
Firm FE	Yes	Yes
Year FE	Yes	Yes
Controls	No	Yes
Observations	17,648	17,648
Adj. R-squared	0.684	0.691

- When peer firms redact less product market information after an increase in explicit collusion costs, firm's profitability is positively affected

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Disclosure about competitive environment (Table 8)

	%Competition		*Competition Noise*	
	(1)	(2)	(3)	(4)
Foreign Leniency	-0.876***	-0.859***	-0.637**	-0.607**
	(0.233)	(0.239)	(0.230)	(0.235)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
Observations	26,837	26,837	19,688	19,688
Adjusted R-squared	0.454	0.455	0.307	0.308

- After an increase in explicit collusion costs, managers discuss less and in a more noisy way about their aggregate competitive environment in MD&A section of the filings

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Regulator IP access (Table 7)

	10-K Filings		*All Filing Documents*	
	(1)	(2)	(3)	(4)
Foreign Leniency	0.155**	0.224***	0.200**	0.301**
	(0.073)	(0.075)	(0.086)	(0.104)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
Observations	11,405	11,405	11,405	11,405
Adj. R-squared	0.221	0.224	0.276	0.279

- After an increase in explicit collusion costs, antitrust agencies are more likely to access firms' financial statements

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Competition disclosure and cartel convictions (Table 8)

	Convicted Cartels		*Convicted Firms*	
	(1)	(2)	(3)	(4)
Lagged %Competition	0.14*	0.19*	0.36*	0.46*
	(0.08)	(0.09)	(0.21)	(0.25)
Foreign Leniency		2.19***		4.44***
		(0.60)		(1.21)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	337	337	337	337
Adj. R-squared	0.24	0.27	0.18	0.21

- Past aggregate disclosure about competition is associated with new antitrust enforcement actions

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