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# Screens for Conspiracies and their Multiple Applications

**Rosa M. Abrantes-Metz, PhD**

NYU Stern School of Business & AFE Consulting

ABA Brown Bag Series “Beyond Leniency: Empirical Methods of Cartel  
Detection,” December 15<sup>th</sup> 2011

## What is a Screen?

- **A screen is a statistical test designed to identify:**
  - Whether collusion (or other type of cheating) may exist in a particular market
  - Who may be involved
  
- **Screens use commonly available data such as prices, bids, spreads, market shares or volumes. They compare suspected patterns against appropriate benchmarks**
  - Abrantes-Metz (2011a, 2011b), Abrantes-Metz and Bajari (2009, 2010), Harrington (2008, 2006), Proof of Conspiracy Under Federal Antitrust Laws, Chapter VIII, ABA Editions (2010)

# Multiple Uses of Screens

## ■ Detection

- Competition authorities
- Market regulators
- Buyers

## ■ Litigation

- Effects analysis: evidence of collusion (or lack thereof)
- Motions to dismiss, *Twombly*
- Class certification
- Damages estimation

# Multiple Uses of Screens

- **Pre-Litigation**
  - Leniency application decision
  
- **Corporate counsel**
  - For internal monitoring, auditing and increased compliance robustness
  - For due diligence process, during mergers and acquisitions
  
- **Procurement Departments**
  - Monitoring and detection

## Evidence *for* and *against*

- When properly developed and applied, screens can provide valuable evidence *against* the existence or materiality of alleged anticompetitive behavior, every bit as much as they can provide evidence *for* it

# Screening Strategies

## 1. Improbable events

- Identify events that are highly unlikely to occur under competition

## 2. Control group

- Benchmark a suspected firm's behavior against unsuspected benchmarks in the same or related markets, to identify deviations indicative of possible collusion

# Properties of a Good Screen

1. Low false positives and negatives
2. Easy to implement
3. Costly to avoid
4. Empirical and/or theoretical support

## Examples of Screens

- **Screens have been developed and used to test:**
  - High correlations between auctions' bids
  - High average price
  - Low price variance
  - Structural break in price
  - Low pass through rates
  - Market shares stability among alleged cartel members
  - Price distributions violating mathematical laws (Benford's Law)

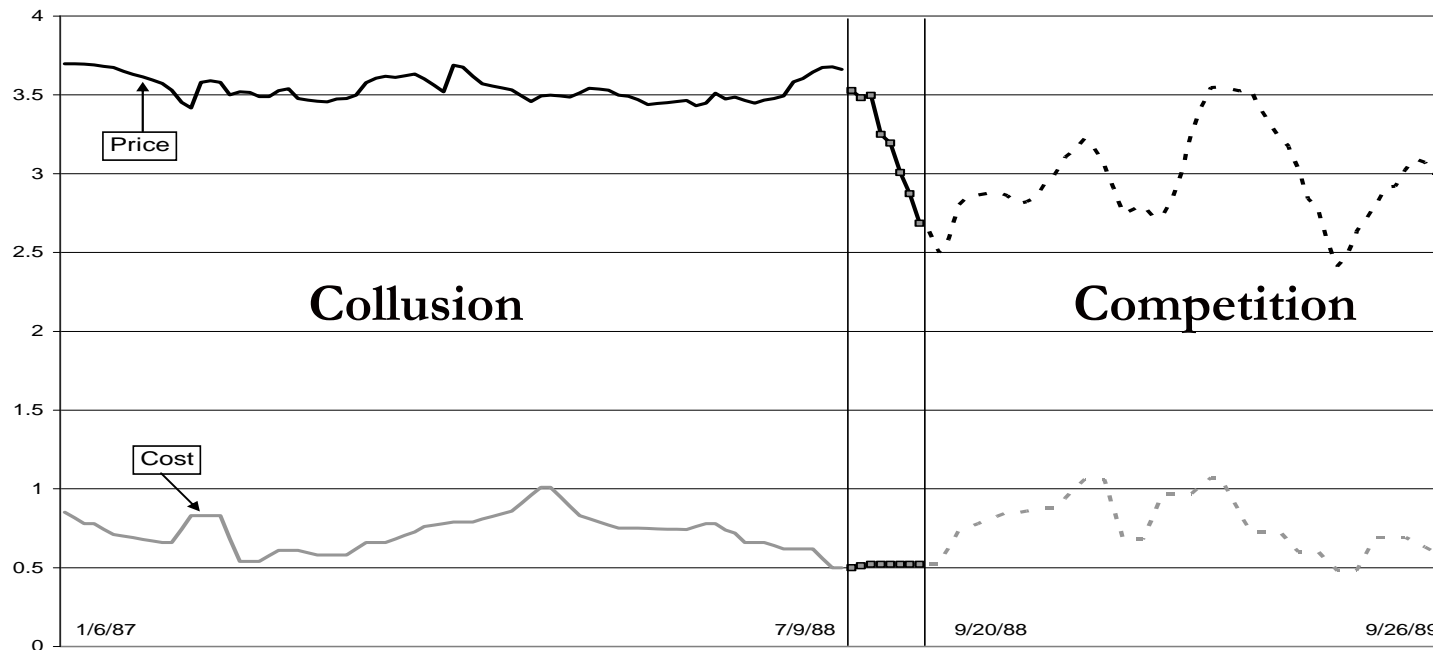


# Using Screens for Detection

- **Competition Authorities Worldwide:**
  - US Federal Trade Commission, European Commission
  - UK's Office of Fair Trading
  - The Netherlands, Austria, Italy, Turkey, Ireland, Hungary
  - Brazil, Mexico, India, South Africa, Japan
  
- **Also in the US:**
  - Securities and Exchange Commission
  - Commodity Futures Trading Commission

# A Variance Screen for Collusion

**Frozen Perch Prices and Costs: 1/6/87 - 9/26/89**



(Abrantes-Metz, Froeb, Geweke and Taylor (2006))

## Variance Screen Validation: Italy

- **Italian Competition Authority – Esposito and Ferrero (2006) tested the power of the variance screen to detect explicit collusion in two well-known Italian cartel cases, with success:**
  - In the market for motor fuel (gasoline and diesel) and in the market for personal care and baby milk sold in pharmacies
  - Had the variance screen been used to detect these cartels, it would have correctly identified the participants and regions *before* the Competition Authority

## Price Screens Validation: Germany

- **Hüschelrath and Veith (2011) ZEW, Germany, show the power of screens to detect explicit collusion by German cement producers if applied by buyers:**
  - Using a data set with 340,000 market transactions from 36 smaller and larger customers of German cement producers, the authors applied a screen for structural breaks in prices which correctly identified collusion
  - Had it been applied, this screen would have allowed customers to have detect the upstream German cement cartel *before* the Competition Authority

## Screens in Action

- **Several countries have triggered investigations following economic and empirical screens, including:**
  - Screens on cross-country price benchmarking in the Italian baby milk market
  - Screens based on structural indicators in the Dutch shrimp market
  - Bid-rigging screening in Mexican pharmaceutical markets
  - Price variance screens to prioritize complaints in the Brazilian gasoline retail market
  - Screens on inside spreads flagged an alleged NASDAQ conspiracy among dealers
  - Screens on stock prices excess returns flagged stock options backdating and springloading cases in the US

## Screens in Action: The Libor Rate

- **Most recently:**
  - The Alleged Manipulation and Conspiracy of the Libor Rate
    - Wall Street Journal, April 2008
    - Abrantes-Metz, Kraten, Metz and Seow, “Libor Manipulation?,” First Draft August 2008, Journal of Banking and Finance, 2012, forthcoming
    - Abrantes-Metz, Judge and Villas-Boas, “Tracking the Libor Rate,” Applied Economics Letters, 2011.
    - Other press coverage

# Screens in Action: The Libor Rate

## ■ What is the Libor

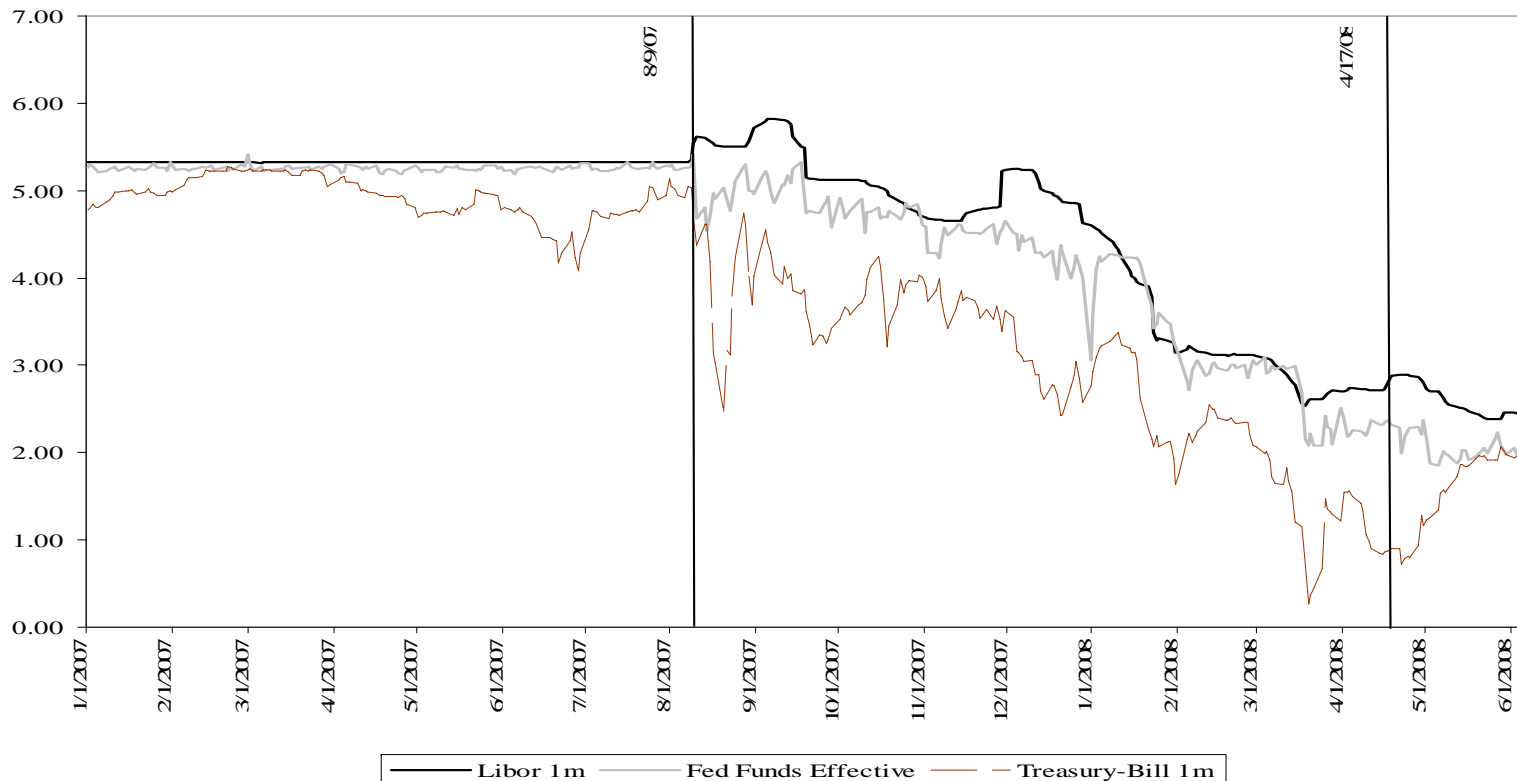
- The British Banker's Association (BBA)'s website states that the Libor is the primary benchmark for short term interest rates globally
  - It is used as the basis for settlement of interest rate contracts on many of the world's major futures and options exchanges, as well as most over the counter and lending transactions (\$350 trillion worth of contracts referencing the Libor)

## ■ How it is set

- 16 banks provide daily quotes on the Libor, and the "middle 8" quotes are converted into Libor through a simple arithmetic mean calculation
  - The Libor quotes are supposed to reflect the rate at which large banks can borrow unsecured funds from other banks

# Libor Rate 2007 – May 2008

**Libor 1m, Fed Funds Effective Rate and Treasury-Bill 1m**



(Abrantes-Metz, Kraten, Metz and Seow (2008))



## Screens in Action: The Libor Rate

- **In August 2008, Abrantes-Metz et. al. flagged the possibility of a Libor conspiracy and manipulation, through the application of a variety of screens:**
  - Properties of the US Libor rate over time
  - Properties of intraday average and dispersion of banks' individual Libor quotes
  - Benchmarking against Credit Default Swaps, market implied ratings, market capitalization, Fed funds effective rate and T-bill, mathematical laws
  
- **Current worldwide investigations:**
  - US DOJ, SEC, CFTC, EC, Japanese FTC and others, and also private litigation

## Powerful but not a Panacea

- **Like any other tool, screens can be misused. They cannot be said to lack robustness if they do not deliver the same result when:**
  - Testing levels versus growth rates
  - Using alternative benchmarks and time periods
  - Controlling or not for key relevant factors
  
- **Criticisms sometimes raised against screens are truly problems of conception and implementation, not problems of the screening methodology itself**
  - Expertise is required in developing and implementing screens

## Powerful but not a Panacea

- Screens have to be properly developed and implemented to be powerful
- Even when properly developed and applied, screens will present type I and II errors, just like any other statistical test and medical screens
- Screens can only be applied when appropriate data are available

## Powerful but not a Panacea

- **No purely empirical or statistical approach can ever prove of disprove the existence of an explicit conspiracy**
  - Screens can provide valuable circumstantial evidence on both sides of litigation
  
- **Screens allow the focus of resources into those areas flagged as indicative of possible anticompetitive behavior**
  - As in medical screens, not all patients are subject to the most extensive and expensive testing, only those who have screened positively

# Golden Rules of Screens

- 1. One size does not fit all**
- 2. If you put garbage in, you get garbage out**

## Final Remarks

- Every cartel detection tool has advantages and disadvantages. **The art of cartel detection comes in understanding the strengths and weaknesses of various tools and thereby understanding when and how best to apply them:** screens are no different
  
- Economic analysis and empirical methods are playing ever increasing roles in conspiracy cases, as:
  - Data become more available and of better quality
  - Screens are showing ever increasing power of detection

**Thank you very much!**

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## Rosa M. Abrantes-Metz, PhD



Dr. Rosa M. Abrantes-Metz is a principal in the antitrust and finance practices of AFE Consulting and an Adjunct Associate Professor at Leonard N. Stern School of Business, New York University. She is a pioneer in the area of screens for conspiracies and manipulations, work she initiated as a staff economist at the US Federal Trade Commission. Dr. Abrantes-Metz is the author of several articles on econometric methods and screens, conspiracies and manipulations, gasoline, pharmaceuticals and health care, telecommunications, monetary policy, event studies, valuation, structured finance, credit default swaps, credit ratings and new statistical tests, representing some of the areas in which she has also worked as an economic consultant; she has published in various peer-reviewed journals and trade publications, and contributed to books on antitrust and finance. Dr. Abrantes-Metz has developed numerous empirical screens for conspiracies and manipulations and flagged potential anticompetitive behavior leading to large scale investigations, and has also used these methods to defend against allegations of such behavior. Her screens are used by competition authorities, defendants and plaintiffs worldwide.

Dr. Abrantes-Metz's research on pharmaceuticals and on conspiracies and manipulations has been discussed in books on how to value pharmaceutical and biotechnology companies, and on publications pertaining to health care, intellectual property and cartels. Her work has been featured in the press such as *The Wall Street Journal*, *Financial Times* and *Investor's Business Daily*. She has provided testimony related to alleged bid-rigging and price-fixing, and in international arbitration on the valuation of expropriated assets.

Dr. Abrantes-Metz holds a Ph.D. and a Masters in Economics from the University of Chicago. She also holds a Masters in Economics from the Universitat Pompeu Fabra in Barcelona, Spain, and a Licenciatura in Economics from Universidade Católica Portuguesa. She is a member of the *Who's Who* of Competition Lawyers & Economists.



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# Conspiracy Screens: Practical Defense Perspectives

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Detection,” December 15th 2011

- Traditional Defense Counsel -- and Judicial -- Skepticism
  - The Intrusion of Economic Theory Into Fact Based Evidence
    - We Only Trust Testimony That Explains “the What and Why”
    - We Do Not Endorse What We Don't Understand
    - We Cancel Out Dueling Economists

- Screens As a Key Tool For Detection --  
Not As the Complete Answer
  - Screens Are a Significant Detection Tool
    - Positive Results **Begin** the Factual Investigation,  
Not **Complete** It
    - Positive Results Are the Road Map, Not the  
Destination
    - Enforcers and Plaintiffs Should Appreciate This

- **Screens Are a Key Tool For Defense Counsel**
  - Before Investigations and Litigation, Screens Enhance Compliance Programs, Audits or M&A Due Diligence
    - Compliance Interviews Are Effective Only When Counsel Has Leverage
      - The Whistleblower's Statement
      - The Hot Document
      - The Econometric Study
    - Without Such Leverage, Most Employees Has Every Incentive to Shade the Truth -- or Lie!
    - Econometric Analysis Is an Unknown to Most Executives and Will Likely Frighten Them

- During Investigations and Litigation, Screens Can Rationally Determine the Duration, Breadth and Success of a Conspiracy
  - Mapping When the Conspiracy Was Ineffective -- Or Limited
  - Determining Where the Conspiracy Did Not Occur
  - Measure the Impact of the Conspiracy on Customers

- When a Violation Is Detected, Screens Open the Door to a Leniency Application
  - If the Company Finds a Problem, It Can Act Quickly
  - Seeking "A" Leniency Provides The Most Benefit to the Company

- **Effective Screens and Leniency Programs Enhance Each Other**
  - Enforcers With a Leniency Applicant Can Test the Viability of the Applicant's Allegations With a Screen
  - Enforcers Can Broaden the Range of Industries They Investigate By Using Screens
  - When Enforcers Conduct the Majority of Their Investigative Work in One or Two Industries, True Deterrence Is Compromised

- **Concluding Thoughts**
  - Screens Are Not the Total Answer
  - Enforcers Should Use All Available Tools
  - If Screens Help to Destabilize Cartels, They Have Great Value
  - Screens and Leniency Together Can Broaden Detection -- and Strengthen Deterrence



  
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# **Screens in the Gas Retail Market**

## **The Brazilian Experience**

Carlos Ragazzo

CADE and Fundação Getúlio Vargas

# Competition Scenario

- Deregulation of the Gas Retail Industry
- Breach of Expectation
- Substantial Load of Complaints

# Cartel Evidence?

- Similar Prices
- Similar Increases (time wise)
- Prices Higher than Cities Nearby

# Informational Problem

- Homogeneous product (gas)
- Price Transparency
- Consequence?

# Screen

- 1<sup>st</sup> test: analysis of the evolution of the retail profit margin of the city (at least three years, but preferably five years)
  - Should the profit margin be increasing, the analysis continues
- 2<sup>nd</sup> test: analysis of the correlation between the retail margin and the coefficient of variation (level of dispersion in prices) for the city
  - Should the correlation be negative, there is preliminary evidence of cartel
- 3<sup>rd</sup> test: analysis of the correlation between the retail profit margin of the city compared to the retail profit margin of the State
  - Should the correlation be negative, there is preliminary evidence of cartel

# Data Used in the Screen

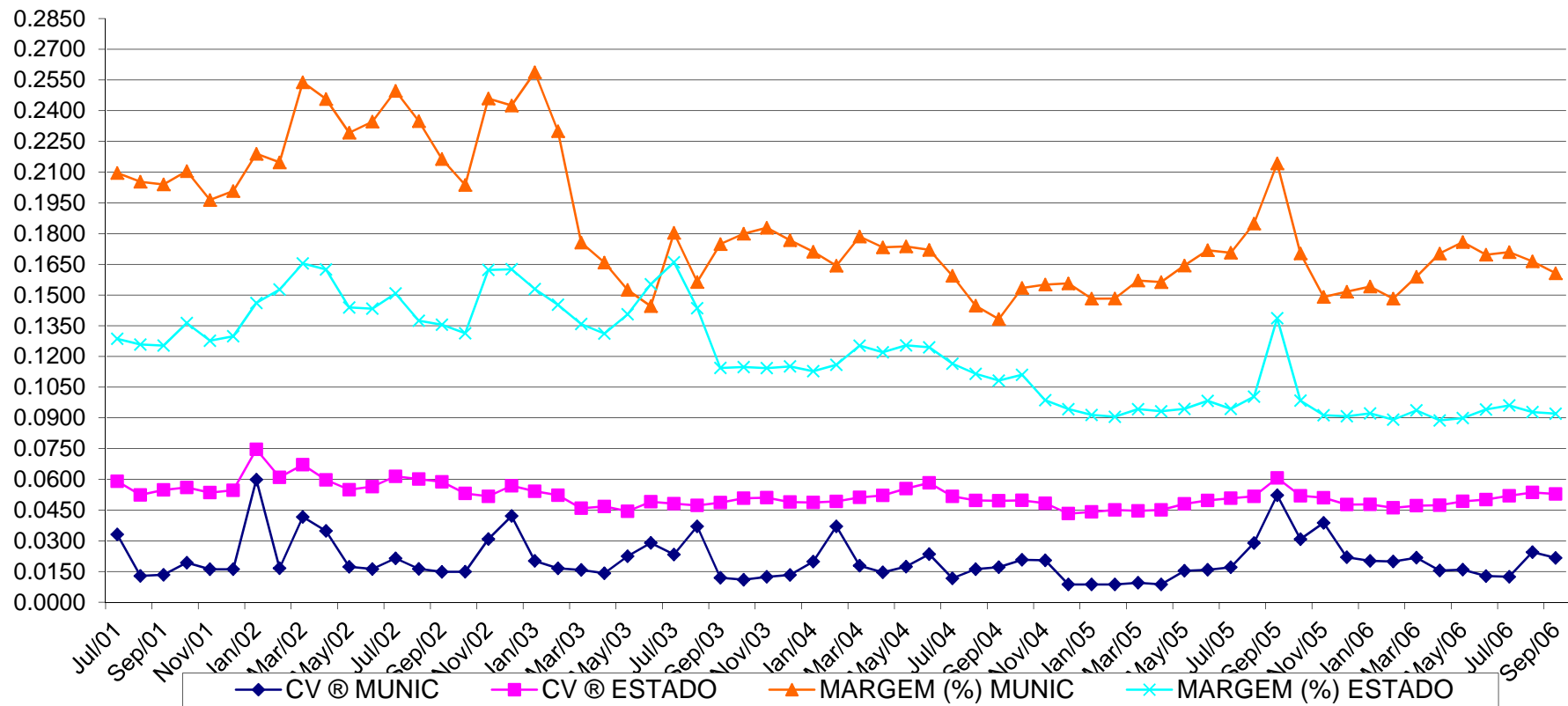
data	MUNICÍPIO	Nº DE POSTOS PESQUISADOS	PREÇO AO CONSUMIDOR					PREÇO DISTRIBUIDORA				MR	CR	CD	MR - CR	teste -t	E - M
			PREÇO MÉDIO	DESVIO PADRÃO	PREÇO MÍNIMO	PREÇO MÁXIMO	MARGEM MÉDIA	PREÇO MÉDIO	DESVIO PADRÃO	PREÇO MÍNIMO	PREÇO MÁXIMO						
jul/01	OLINDA	162	1,719	0,055	1,6	1,75	0,292	1,426	0,065	1,318	1,549	0,204769	0,031995	0,045582	-0,39655	-3,61409	0,857584
ago/01	OLINDA	145	1,738	0,026	1,64	1,79	0,25	1,488	0,035	1,372	1,595	0,168011	0,01496	0,023522			
set/01	OLINDA	144	1,702	0,062	1,53	1,756	0,216	1,486	0,023	1,45	1,543	0,145357	0,036428	0,015478			
out/01	OLINDA	178	1,717	0,065	1,57	1,87	0,214	1,503	0,034	1,423	1,589	0,142382	0,037857	0,022621			
nov/01	OLINDA	144	1,683	0,062	1,55	1,79	0,164	1,519	0,034	1,46	1,606	0,107966	0,036839	0,022383			
dez/01	OLINDA	180	1,665	0,117	1,4	1,79	0,169	1,496	0,057	1,323	1,606	0,112968	0,07027	0,038102			
jan/02	OLINDA	144	1,406	0,084	1,21	1,59	0,128	1,277	0,082	1,15	1,52	0,100235	0,059744	0,064213			
fev/02	OLINDA	143	1,46	0,053	1,29	1,499	0,242	1,218	0,045	1,132	1,33	0,198686	0,036301	0,036946			
mar/02	OLINDA	144	1,553	0,081	1,46	1,689	0,304	1,249	0,041	1,122	1,33	0,243395	0,052157	0,032826			
abr/02	OLINDA	177	1,613	0,13	1,39	1,88	0,255	1,358	0,055	1,213	1,485	0,187776	0,080595	0,040501			
mai/02	OLINDA	179	1,729	0,036	1,6	1,9	0,339	1,391	0,036	1,325	1,485	0,24371	0,020821	0,025881			
jun/02	OLINDA	144	1,693	0,063	1,43	1,79	0,303	1,389	0,031	1,34	1,475	0,218143	0,037212	0,022318			
jul/02	OLINDA	216	1,669	0,116	1,35	1,79	0,243	1,427	0,043	1,3	1,5	0,170287	0,069503	0,030133			
ago/02	OLINDA	168	1,778	0,027	1,63	1,87	0,367	1,411	0,091	1,233	1,518	0,260099	0,015186	0,064493			
set/02	OLINDA	128	1,722	0,085	1,45	1,781	0,256	1,467	0,034	1,408	1,517	0,174506	0,049361	0,023177			
out/02	OLINDA	161	1,731	0,1	1,39	1,9	0,283	1,448	0,068	1,294	1,533	0,195442	0,05777	0,046961			
nov/02	OLINDA	126	1,971	0,094	1,77	2,04	0,347	1,624	0,073	1,489	1,746	0,21367	0,047692	0,044951			

# Screens

- Justify the cost of opportunity of pursuing an investigation
  - Extremely successful as grounds for rejecting cartel complaints in the gas retail market
  - Few cases have been convicted based on indirect evidence. None based solely on screens.
- Serve as grounds (together with other evidence) for a judicial decision granting a dawn raid or wiretapping
  - Ex officio investigations?

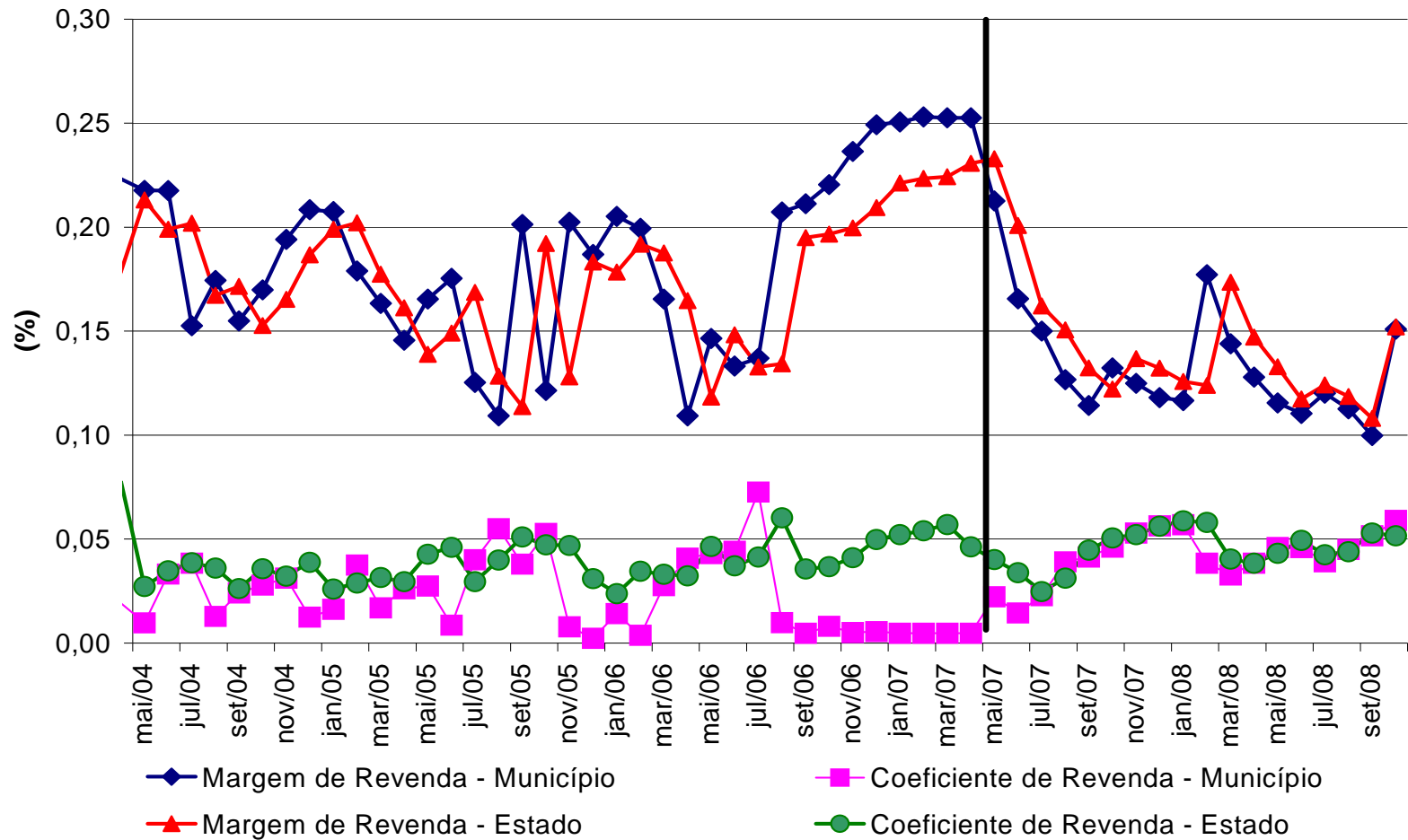
# Screens

Data Used for Screening: Volta Redonda x Rio de Janeiro





# Dawn Raid "274"



# Screens - Triage

- Public awareness of the screen: consequences
  - Fewer complaints
  - Faster dismissals
  - Better allocation for governmental resources
  - Screens for obtaining direct evidence

# Next

- Collusion in Public Procurement
  - Cooperation with other Governmental Agencies
  - Access to Data Warehouse of Comprasnet (aggregated data storage on federal government purchases)
  - Development of software tools to identify bid rigging patterns

  
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# Thank You

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# The Use of Cartel Screens

Professor D. Daniel Sokol  
University of Florida Levin College  
of Law

# Screens uses in compliance

- Compliance is a Daily Function
- How Can You Effectively Monitor Employees?
- Employees sometimes hide facts out of fear of detection
- Sometimes it is difficult to gain employee trust
- A company may have multiple business lines and tens of thousands of employees.
  - How do they determine what are the highest risks business lines or activities?
  - Screening can help identify red flags for the company to use in determining where to focus its efforts.
- Screens allow for better detection in the corporate setting in non-antitrust areas of regulation
  - To detect insider trading (screening to detect excessive trading volume prior to release of material non-public information)
  - To detect fraud (transaction execution reporting, questionable payments)

# Importance of Screens to Compliance

- US Sentencing Guidelines - need to audit or monitor.
- Antitrust screens should be part of compliance budgeting for corporations.
  - "Improve efficacy"
  - Less expensive alternative to full-scale audit
- This creates buy-in from others within the corporation that antitrust compliance matters to the corporation
- Screens may increase compliance by executives who know company is watching them and will sell them down the river and who fear jail time.

# Screens in M&A

- You are selling due diligence
- The acquirer is on the hook for the past misdeeds of the target firm
- This can be substantial in antitrust – criminal and civil penalties, loss of goodwill
- Cartel screens another form of risk to be assessed in pricing of a deal
- Two Types of Screens Might Be Useful
  - Structural screening – this identifies markets for which a cartel is likely to form
  - Behavioral screening – identifies markets for which a cartel has formed
- The cost of screens are trivial relative to the overall deal
- Acting early saves money later on



# Cartel Screens and Leniency

- No compliance program guarantees lawful conduct
- Screens allow for internal detection of questionable patterns of pricing, bids, costs, etc.
- For firms – screens allows for internal detection and allows for firms to apply for leniency first based on the information that they uncover
- From the part of agencies – screens allow better detection. This encourages the race to leniency

# Screens after *Twombly*

It is not entirely clear if *Twombly* supports screens

## Pro

- *In re Blood Reagents Antitrust Litig.*, 756 F. Supp. 2d 623, 632 (E.D. Pa. 2010)
- *Std. Iron Works v. ArcelorMittal*, 639 F. Supp. 2d 877, 900 (N.D. Ill. 2009)
- *In re OSB Antitrust Litig.*, No. 06-826, 2007 WL 2253419 (E.D. Pa. Aug. 3, 2007)

## But see

- *In re LTL Shipping Serv. Antitrust Litig.*, No. 1:08-MD-01895, 2009 WL 323219
- *In re Graphics Processing Units Antitrust Litig.*, 527 F. Supp. 2d 1011 (N.D. Cal. 2007)