THE FUTURE OF CARTEL DETERRENCE AND DETECTION

BY ROSA M. ABRANTES-METZ & ALBERT D. METZ[1]

1 Rosa M. Abrantes-Metz is a Managing Director in the Antitrust, Financial Regulation, and Securities Practices at Global Economics Group, and an Adjunct Associate Professor of Economics at New York University's Stern School of Business; RAbrantes-Metz@GlobalEconomicsGroup.com. Albert D. Metz is a Managing Director in the Antitrust, Financial Regulation, Securities, and Data Mining Practices at Global Economics Group, and a former Group Managing Direction at Moody's Investor Services; AMetz@globaleconomicsgroup.com. The views expressed in this article are our own independent views and do not represent the views of the organizations with which we are affiliated or our clients.

I. MOTIVATION

Over the last few decades, leniency programs recorded a successful history of identifying and dismantling cartels. The essential idea is simple, that authorities will reward a cartel member who self-reports. It is instructive to consider why authorities have relied so heavily on leniency in the past. First, it is not particularly resource intensive to implement. It doesn't require collecting large amounts of data and employing economists and data analysts to sift through the haystack in hopes of finding the occasional needle. Second, almost by definition leniency is likely to have a high success rate of prosecution, among those applications selected to be fully investigated. It is noteworthy though that authorities are reluctant to produce statistics on the overall efficacy of their leniency programs. We should have a better idea of how many leniency applications are reviewed and investigated (among all those filed), and of those, how many lead nowhere. But we are not privy to such valuable information.

Can authorities continue to almost exclusively depend on leniency programs going forward? There is no other area of criminal investigation which essentially waits for the guilty to confess as its key detection tool, yet the advantages of resource and success of such "passive detection" would equally apply to robbery or homicide: it doesn't cost much to wait for a confession, and if someone confesses, the case will almost certainly be closed successfully. But while the police surveil neighborhoods to monitor possible illegal conduct, ready to not only detect ongoing conduct but also hopefully to deter such conduct from even getting started, several competition authorities still tend to lack the proactive nature of detection and deterrence through screening or market monitoring, relying (almost entirely) on leniency programs. Hence, cartel detection appears, at least at first, to be a uniquely passive area of law enforcement.

In this short paper we explore the role of leniency programs in the next generation of cartel detection, and ultimately deterrence. Will it continue to be the dominant source of cartel detection, or will advances in data collection and analysis – so-called "big data" and "machine learning" – reduce the cost and increase the effectiveness of screening and artificial intelligence techniques? Will traditional leniency and whistleblower programs even remain effective in a future which may keep no "paper trail" of communications proving the necessary intent? Have we learned the lessons from extensive rigging in financial markets? Do we need to revisit the entire detection approach?

II. LENIENCY HAS STRENGHTS AND WEAKNESSES

Before authorities investigate any sort of crime, the crime must be identified. The police will investigate every missing person report, but they do not knock on every door every day to make sure everyone is accounted for. Instead, they wait ("passively") until someone *informs* them that a person is missing.

In general, most crime is reported by the victim. The challenge with many cartels is that the victims of the cartel are diffuse, and the victims may not *know* they are victims. As a practical matter, who else but a member of the conspiracy is likely to report the crime, if even the victims do not know? It is eminently sensible for competition authorities to put an emphasis on leniency.

But while leniency is effective, and likely necessary, many competition authorities no longer believe it should be their almost exclusive approach to cartel detection. For example, in its 2006 Committee of Public Accounts Report, the Office of Fair Trading's competition enforcement explained that:

> **The OFT has been too reliant on complaints as a source for its competition enforcement work.** The OFT should start a greater proportion of investigations on its own initiative, rather than waiting for a relevant complaint.[2]

After all, leniency is not without its drawbacks. It requires some cartel member to calculate that reporting the cartel is more beneficial than participating in it. But if the cartel is very successful – which means that its social harm is that much greater – then it becomes *less* likely that it will be self-reported to authorities. On the other hand, the more effective the cartel in terms of affecting market outcomes, the easier it will be to find through empirical screening techniques. Put simply, the likelihood of detection through leniency is *decreasing* with the cartel's effectiveness, while the opportunity of detection through screening is *increasing*.

While properly structured leniency programs are desirable and should remain in use, there is no reason they can't be supplemented by other methods, namely active market screening, and other programs. We have made this argument before, over the years (see, for example, Abrantes-Metz (2013)).[3] This is especially true given the large success that screens have had over at least the last decade. In the last 15 years since screens have been advanced and implemented by economists including Abrantes-Metz, Harrington, Bajari, Froeb, and others,[4] many competition authorities around the world have started to develop and implement screening methods. These efforts need to continue, but what else should be done?

III. SCREENS ALSO HAVE STRENGHTS AND WEAKNESSES, BUT COMPLEMENTARY TO LENIENCY

Screens are not an alternative to leniency, they are best seen as a supplement. Often, after screens first flag the possibility of collusion, successful leniency applications follow. The question is no longer whether leniency should be supplemented, but *how* leniency *must* be supplemented.

It was reporters and economists, not competition authorities, who developed and implemented screens which flagged the possibility of collusion in *LIBOR, Foreign Exchange, Gold* and *Silver London Fixings*, among others. Many of these led to leniency applications down the road such as on *LIBOR* and *Foreign Exchange*. Had the alleged conduct not first been flagged through screening, how likely is it anyone would come forward to confess to authorities and forego significant profits from the alleged market rigging?

Furthermore, these alleged collusions initially flagged by screens have in some cases led to investigations in other markets, such as Euribor. Several of these have yielded tens of billions of dollars in settlements for governmental agencies and private plaintiffs around the world, with more still to come.

Many of these cases involved structures which were flawed from the start, easy to rig, and which should never have been put in place. There have consequently been efforts to reform several financial benchmarks around the world through International Organization of Securities Commission, the Commodities Futures Trading Commission, the United Kingdom Financial Conduct Authority, and the European Commission. If successful, these reforms may reduce future malfeasance.

2 House of Commons, Committee of Public Accounts, "Enforcing competition in markets," Forty-second Report of Session 2005-06, page 5.

3 "Roundtable on *Ex Officio* Cartel Investigations and the Use of Screens to Detect Cartels, A Paper by Rosa M. Abrantes-Metz," prepared for the Directorate for Financial and Enterprise Affairs, Competition Committee, Organization for Economic Cooperation and Development, for discussion at its meeting held on October 31, 2013, OECD, Paris.

4 Examples of some of the first papers advocating for screening include "A Variance Screen for Collusion," R. M. Abrantes-Metz, Luke M. Froeb, John F. Geweke & Chris T. Taylor, *International Journal of Industrial Organization*, 24, 467-486, 2006; "Competition Authorities are Screening for Conspiracies: What are they Likely to Find?" R. M. Abrantes-Metz, Luke M. Froeb, *The American Bar Association Section of Antitrust Law Economics Committee Newsletter*, 8(1), 10-16, Spring 2008; "Screens for Conspiracies and their Multiple Applications," Rosa Abrantes-Metz & Patrick Bajari, *The Antitrust Magazine*, 24(1), Fall 2009; Joseph Harrington, 2004, "Detecting Cartels," preliminary draft available at https://www.competitionpolicyinternational.com/assets/Uploads/Detecting-Cartels.pdf, later published in the in the Oxford Handbook of International Antitrust Economics.

While screens are effective, we commonly hear concerns from competition authorities that they are too resource-intensive. This and several other common arguments against screens, along with counterarguments, were addressed in detail in Abrantes-Metz 2013's submission to the OECD. Resources will always be limited, and choices will always be necessary. But screening programs are becoming less expensive to develop as data are increasingly available, and sophisticated algorithms are constantly being developed and improved. While there may be some practical challenges in some cases, at least in principle screening is a type of "pattern matching" at which artificial intelligence and machine learning techniques excel.

IV. PROVING EXPLICIT COLLUSION

Once collusion is identified, whether through leniency or through screens, the successful prosecution of a cartel often relies on the paper trail left by its members. E-mails, notes, and other records documenting the intent to collude and the existence of an explicit agreement is what separates illegal explicit collusion from legal, and otherwise perhaps mostly indistinguishable, tacit collusion.

Everyone – including the guilty – knows this. And everyone – especially the guilty – have learned their lessons from *LIBOR* and *Foreign Exchange*: actual and potential wrongdoers have learned that their incriminatory emails and chat messages may hang them. We should expect cartel members to adopt new communication technologies which do not keep records, at least not as easily.

Just as communication methods have become more sophisticated, the same needs to happen to detection methods. Authorities need to face the reality that direct evidence will probably be harder to come by, and that proactive reform of deficient structures is needed, coupled with active market screening. It is past time we learn our lessons.

V. A BRAVE NEW WORLD IN THE COLLUSION ARENA

Our experience from working on cases of collusion across all manner of industries for about two decades tells us that cartel behavior is changing. Over time, we are seeing less of the traditional "smoke filled rooms" of in-person conversations directly fixing prices; instead we are seeing more elaborate cartels, new forms of collusion, and new, more complex markets emerging in which collusion may flourish. Deterrence and detection tools need to change accordingly, or they will eventually become obsolete and potentially ineffective.

- *Changes in Financial and Commodities Markets Trading Facilitate and Provide the Incentive for Rigging*

There have been significant changes in financial and commodities markets over the last decades. The greater transparency from real time trading information across markets combined with a handful of dominant market players facilitates the emergence of collusion. Collusive conduct is easier to monitor and deviations from an explicit agreement are more easily punished, thus extending the duration of cartels.

In addition, the ever-expanding set of financial derivatives which are based on opaque price benchmarks provide an additional incentive, and opportunity, for collusion and manipulation, through a multiplier effect on illicit gains. Derivatives, while creating real economic efficiencies and helping to complete markets, also have the potential to magnify a "small" artificiality in the price of the underlying good into many millions or even billions of dollars in illicit daily gains. Furthermore, the complexity inherent in these transactions and their variety make it hard for regulators to identify foul play.

- *New Types of Collusion Are Emerging*

New types of collusion also seem to emerge at higher frequencies. For example, more cases of market spoofing have been identified. Market spoofing refers to a practice in which traders give a false impression of particular market conditions – for example, by placing too high bids or too low asks which they don't intend to execute – in order to fool the market into believing fundamental prices have moved. As the market adjusts to the perceived information moving prices to the desired direction by colluders, they cancel their orders to buy or sell, benefiting from the market artificiality they caused in the same market or in a related market. The communications below identified in filings by authorities in precious metals show a couple of examples of this conduct.

> On January 25, 2008, a UBS trader, Trader A, discussed trading activity with a trader, Trader B, who was employed by another large financial institution ("Financial Institution 1"). Trader A wrote: "hahaah," to which Trader B responded: "***u [mu]st have [a] bout gazillions … and u spoof the sell.***" Trader A wrote: "we good ain[']t we," to which Trader B responded: "not very friendly." Trader A wrote further: "we never are … u want a fr[ien]d … get a dog … ahahahah."[5] (Emphasis added.)
>
> In a July 19, 2011 chat, Trader F discussed trading activity with another trader, Trader H, who was employed by Financial Institution 1 in Singapore. Trader F wrote: "u are short, u want me to ram up gold? … haha." Trader H at Financial Institution 1 responded, "haha … yes." Trader F wrote further: "***just sit on the bid … let me spoof it for u … don[']t pay me on the futures.***"[6] (Emphasis added.)

- *New, Complex, and Unregulated Markets Facilitate Rigging*

There are not only new ways to collude, new incentives to collusion, but also new markets to potentially manipulate and collude upon. For example, cryptocurrency is a relatively new and complex market, and potential wrongdoing is being identified by reporters and economists, as detailed in Bloomberg's article dated June 29, 2018.[7] The article describes some of the trading patterns in one of the exchanges which raise red flags of potential illegal conduct. Markets in which (i) large trades do not seem to move prices; (2) some trades occur too frequently at very irregular and usual lot sizes; and (3) possible wash trades may have happened, to fool the market into an artificially high volume.

According to news, an investigation on possibly fraudulent practices has been initiated by the U.S. Department of Justice and other bodies.[8] The complexity of these markets and the apparent lack of oversight are an indication that authorities are likely at the bottom of the learning curve in how these markets actually operate and on what normal conduct may be. It may be some time before they can form an opinion on how these markets should operate, to ultimately be able to identify what is likely to be collusive.

- *The Dynamics of Competition, and that of Collusion, are Changing with Big Data and Pricing Algorithms*

The availability of big data, not only historical but also contemporaneous, and the emergence of pricing algorithms have raised concerns on whether collusion may be facilitated and explicit collusion may more easily be replaced by tacit collusion. Before jumping to the tempting conclusion that pricing algorithms will inevitably lead to more collusion, let's take a step back and think about whether they also (or even primarily) facilitate competition. It is true that pricing algorithms are likely to lead to equal prices across competitors, but the relevant question is whether prices converge to a high rather than to a low level.

Pricing algorithms provide many potential supply- and demand-side procompetitive effects, enhancing both static and dynamic efficiencies. When there are many competitors, products are homogeneous, cost functions are identical, there is perfect information and no barriers to entry, we attain the socially desirable outcome of perfect competition. This means that price is equal to marginal cost, the standard benchmark for competition. By allowing a quicker spread of information in the market (between supply and demand), and a rapid response to market conditions, pricing algorithms are likely, at least in some cases, to further facilitate reaching a perfect competition-like outcome.

That said, in industries where collusion was already more likely to occur (for example, because structural factors, such as having few customers and high barriers to entry, facilitated the occurrence of such conduct) pricing algorithms may enhance the monitoring and punishment of an explicit collusive agreement. They may even potentially replace the need to explicitly collude, with the convenience of tacit collusion. Pricing algorithms may increase the likelihood of tacit collusion in other markets where tacit collusion may have been harder to achieve and sustain over time, as in less concentrated markets (more easily allowing alignment of pricing across a larger number of competitors). Fundamentally, pricing algorithms change structural features of the market in terms of demand elasticity, barriers to entry, diversification, and others, changing the dynamics of competition and likely, the dynamics of collusion as well.

---

5 Source: CFTC Order Re: UBS AG, filed January 29, 2018, p. 3.

6 *Id.*, p. 4.

7 Matthew Leising, Mira Rojanasakul, Demetrios Pogkas & Brandon Kochkodin, "Crypto Coin Tether Defies Logic on Kraken's Market, Raising Red Flags," Published: June 29, 2018 | Updated on June 30, 2018, Bloomberg, available at https://www.bloomberg.com/graphics/2018-tether-kraken-trades/.

8 Matt Robinson & Tom Schoenberg May 24, 2018, 4:00 AM EDT Updated on May 24, 2018, "U.S. Launches Criminal Probe into Bitcoin Price Manipulation," Bloomberg, available at https://www.bloomberg.com/news/articles/2018-05-24/bitcoin-manipulation-is-said-to-be-focus-of-u-s-criminal-probe.

While neither the theoretical nor the empirical literatures yet provide a definitive answer as to whether the likelihood of collusion is increased due to big data and pricing algorithms, competition authorities should (and some, such as the U.S. Federal Trade Commission, already have)[9] study this topic to decide what, if anything, should be done in terms of law and regulation.

Until then, we should acknowledge that pricing algorithms do change the structural features of a market. What is worth stressing is that, to the extent they change the dynamics of competition and collusion, techniques beyond leniency will have to be deployed to detect collusion.

VI. EFFECTIVE CARTEL DETERRENCE AND DETECTION IN THE FUTURE

Besides leniency programs and active market screening, several other components of effective deterrence and detection programs should to be reinforced and improved in some cases, while others need to be implemented. Below we describe these in some detail.

- *Key Role of Antitrust Compliance Programs, Even More So Since Pricing Algorithms*

Collusive conduct occurs within and across corporations, and that is where deterrence needs to start. While one could hope for a change in corporate culture, we cannot simply rely on the natural rehabilitation of bad actors. Antitrust compliance programs need to be significantly enhanced. We all remember the few hours a couple of times a year or so that we were made to attend presentations on compliance at our work places, presentations usually so boring that we would be hard pressed to repeat any of it. More thought needs to be placed into the design of these programs, so that they can deliver enhanced awareness and adherence to the rules. Employees should be made aware that systems are in place which monitor conduct, and in particular, interactions with competitors. They need to know that pricing and bidding decisions are regularly screened for potential unusual patterns, and that they may be called to explain such patterns when needed.

In particular in the era of pricing algorithms, antitrust compliance takes on even greater importance: corporations need to fully understand the inputs and the output of their algorithms, and their general objectives, lest the corporations find themselves liable of collusion through algorithmic practices.

To make the cost-benefit calculation work for the corporation, there needs to be a recognition by competition authorities of the importance of antitrust compliance programs in the fight against collusion. Incentives such as reduced fines or criminal prosecution need to be in place which are strong enough for corporations who have developed reliable compliance programs. After all, such programs may lead to the internal self-identification of collusion, and don't we want corporations to have a larger incentive to self-monitor and self-report? This is where deterrence starts.

Furthermore, the stronger such a program is, the more resources may end up being saved by authorities. Everything else the same, high deterrence within the corporations and high likelihood of internal detection would reduce the need for as many resources to be put in place by authorities for deterrence and detection.

- *Corporate Leniency*

Authorities should also consider corporate leniency. Despite the several incentives already provided by leniency programs, we should ask ourselves if there is anything else that could and should be done to provide an even larger incentive for executives to come forward with direct evidence of the cartel. Leniency programs only partially mitigate the grave consequences faced by an executive who comes forward with the evidence (his own evidence of that of others in the firm) on the existence of a cartel. Even if he receives full amnesty and no criminal prosecution, personal and professional repercussions are likely to be very high (see Klawiter & Driscoll (2008)).[10]

---

9 See for example, https://www.ftc.gov/news-events/audio-video/video/ftc-hearing-7-nov-14-welcome-remarks-session-1-algorithmic-collusion.

10 Donald Klawiter & Jennifer Driscoll (2008), A New Approach To Compliance: True Corporate Leniency for Executives, Antitrust, 22(3).

- *Whistleblower Programs*

More generally, whistleblower programs which provide a monetary incentive to those coming forward with information leading to a successful prosecution or settlement are also needed, independently of whether or not they personally were part of the cartel. While many people will act on their conscience as good citizens, the reality is that often in these situations they will jeopardize their jobs, their reputations, and likely risk never working in the same industry again. Too risky if the financial incentive is not large enough to ensure whistleblowers can keep providing for their families, at the least. Other regulators such as the U.S. Securities and Exchange Commission have these programs, and have successfully detected illegal conduct through them, why shouldn't competition authorities do the same? Inside detailed knowledge of the workings of a cartel will be even more important as written direct evidence becomes scarcer.

- *Public and State Agencies Training and General Awareness*

Educating the general public should also play a role in deterrence and detection. If consumers and officials at local agencies know what to look for, what seems off, they are more likely to detect conduct that would otherwise have just passed through them completely. We are aware of examples bid-rigging with visible concerning red flags which should have easily been identified by state authorities but which were completely missed.[11]

- *Higher Penalties*

And in our view, higher penalties should be considered. While the sentencing guidelines provide a general description of factors to be relied upon for the calculation of fines, the reality is that several of these may not be directly measurable *a priori*, and may also be subjective to a great extent. We are too familiar with cases where the estimated and alleged illicit gains seem to be many orders of magnitude larger than the actual penalties. If actual gains are much larger than penalties, doesn't crime pay? What are a couple of years in jail compared to several hundreds of millions in illicit gains in the bank, to enjoy all the following years? Worthwhile, for many.

- *Proactive Restructuring of Defective Structures Facilitating Rigging*

All in all, we need to deter crime from the start, by making it harder for markets to be rigged. Authorities need to be more proactive in building structures which discourage abuse.[12] To frame the case, let's look at LIBOR rigging more closely. It was a daily report of the interest rate at which large banks could borrow in the interbank market. Hundreds of trillions of dollars in transactions and derivatives were tied to the rate, making it one of the most important financial rates in the world and creating an obvious incentive to manipulate it.

What allowed the manipulation of LIBOR to be as prolonged and successful as it was rests with how it was set. Historically it was based on a simple trimmed average of rates voluntarily postulated and reported by the participating banks with deeply vested interests in the outcome. It was administered by the British Bankers' Association, the banks themselves. Is it surprising that abuse was rampant?

Unfortunately, these sorts of deficiencies are not limited to LIBOR, and just as in LIBOR, the writing is on the wall. Another example, the London gold fixing was set twice a day by five competing banks that participated in private, undisclosed calls as part of a selective auction to trade physical gold. The final auction prices determined the morning and afternoon fixings, setting the value of hundreds of billions of dollars of financial contracts around the world.

While participating in the auction, members not only set prices but held private information on price evolution while trading gold derivatives. The benchmark administrator was, again, the banks themselves through the London Gold Market Fixing. Silver worked similarly, with only three banks and one daily fixing.

11 "City construction bids are paved with questions," published September 15, 2012, *The Montreal Gazette* available at http://www2.canada.com/montrealgazette/news/saturdayextra/story.html?id=eb95260e-dc40-4ada-b7f0-ae56796c8b25; and "Montreal construction companies share common addresses," published June 21, 2014, *The Montreal Gazette*, available at http://www.montrealgazette.com/news/Montreal+construction+companies+share+common+addresses/9959958/story.html.

12 Abrantes-Metz "Time to Reform Deficient Market Structures," Opinion Article published in the Financial Times, April 11, 2016.

Failing to acknowledge the clear structural weaknesses of these settings can perhaps be dismissed as a mistake of the past. Many of these benchmarks have already been reformed and passed to be administered by exchanges such as Intercontinental Exchange and CME Group. But regulators should be asking themselves what other important structures may present similar deficiencies that make them highly susceptible to abuse, and proactively reform them before potential harm is incurred. There certainly are many that we can think of. Our concern though, is that these questions are neither being proactively being asked nor addressed. Should we then be shocked to learn sometime in the future that several other obviously flawed structures have been extensively rigged? Unfortunately, we do not think so.

VII. CONCLUDING REMARKS

Competition authorities have long relied on those with inside knowledge to report collusive behavior. There are a number of good reasons for this and we don't see it going away. Indeed, as communications become more difficult to track, as humans may become increasingly removed from basic pricing decisions, we think the role of the whistleblower may grow in importance in the years to come.

But it would seem short-sighted not to supplement leniency with active screening and other methods. Leniency is less likely to capture the more successful cartels. And empirical screening has already proven its effectiveness in recent years. With the cost of data and data analysis falling, it would make sense for authorities to invest more in active screening programs.

Compliance and antitrust training programs can also effectively deter some cartel formation. It could be, if we are feeling generous, that some more junior staff can form cooperative relationships with their counterparts without realizing that this is illegal. In any event, if the penalties of their behavior attach to some degree on their managers, this again could deter cartel formation.

Ultimately policymakers want to discourage the formation and maintenance of cartels. The benefits of forming a cartel are obvious to its members. Policymakers hope to increase the cost (or risk) of the cartel to the point where it either doesn't form in the first place, or if it does, that it does not endure for long. But as a starting point, they also need to ensure that market structures are inherently harder than currently to be rigged, and they should monitor markets regularly.