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The Law and Economics of Enhancing Cartel Enforcement: Using Information from *Non*-Cartel Investigations to Prosecute Cartels

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CESIFO WORKING PAPER NO. 3506
CATEGORY 11: INDUSTRIAL ORGANISATION
JUNE 2011

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Abstract

I present the following proposal: information revealed during non-cartel investigations by competition law enforcement authorities, such as evaluation of M&As or investigation of monopolization (dominance) conduct, should be directly used to investigate and prosecute cartels. Currently, in several jurisdictions, information acquired in, for example, a M&A investigation typically cannot be directly used for a cartel case due to the underlying statutes and the legal and administrative procedures that govern information use. Reviewing the management and corporate strategy literature, I note that M&As form a vital part of firms' core business strategy, with the longer-run strategic aspects being more important. These longer-run strategies could be jeopardized if the firms were engaging in collusion, as the likelihood of detection and prosecution would increase under the proposed rule change, which would punish bad (collusive) behavior. I argue that irrespective of exactly how many cartels are actually prosecuted via this channel, the proposal has the likelihood of creating a meaningful deterrence effect. I also discuss the potential downsides related to Type 1 errors and administrative costs. Overall, I argue that the proposed rule change could increase the efficiency and effectiveness of cartel enforcement, and open an additional front in the fight against hardcore cartels that operate within jurisdictions as well as internationally.

JEL-Code: A100, D490, K000, K140, K210, L000, L400, L440, L490, M000.

Keywords: cartels, enforcement, law and economics.

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For valuable comments and suggestions on presentations of earlier versions of this paper, I thank: my discussants Sunel Grimbeek, Scott Hammond, Frederic Jenny and Gerd Muehlheusser; participants at the conferences on "Quantitative Analysis in Competition Assessments," Center for European Economic Research (ZEW, Mannheim, 2010), "Global Competition Law Conference: Implementing Competition Law and Policy, Global Perspectives" (New Delhi, 2010), and "Law and Economics" workshop (CESifo, Munich, 2010); and seminar participants at the Directorate General for Competition (European Commission), and the Italian Competition Authority. I also thank Yashusi Kudo, Ken Heyer, Johannes Luebking, Damien Neven and Wouter Wils for providing insights into various investigative and legal processes in different jurisdictions.

1. Introduction

Cartels pose significant problems in many dimensions. The most common effect noted relates to the increase in prices of goods and services, with consequent loss of welfare. Cartels can also result in lower product variety and quality. Offering greater variety and better quality typically involve costly investments by the firms, and collusion serves to reduce costly competition which benefits the firms, but harms consumers who may be left with inferior or a reduced product choices. Cartels may also lead to reduced innovation in the affected markets. Innovation by firms brings new products and processes into the markets, but innovation is typically (very) costly. Collusion may occur to reduce such costly investments, but this harms consumers and markets, and affects longer-run economic growth and productivity.[2] To the extent that reduced collusion would provide enhanced benefits in all of these dimensions, the relevant markets and the economy as a whole would benefit. This encompassing understanding has been the central reason for greatly increased cartel enforcement by the US since the late-1970s, and by the European Commission, and other jurisdictions, since the 1990s. The tools used to disincentivize formation and continuation of cartels have included increased monetary fines, introduction and refinement of amnesty/leniency programs, and incarceration in some jurisdictions.[3]

[2] As an example, the complexity of collusion cases is revealed in the U.S. antitrust case: ALLIED TUBE V. INDIAN HEAD, INC., 486 U. S. 492 (1988). In this case, Allied Tube had set standards for steel based electrical wire conduits in buildings and these standards had been incorporated into safety codes of local governments. A new entrant came into the market with high-quality low-cost plastic based electrical wire conduit. As required, the entrant initiated a proposal before the National Fire Protection Association to extend code approval to the new plastic conduit. Before the Association's 1980 annual meeting was held, the nation's largest producer of steel conduit, members of the steel industry, other steel conduit manufacturers, and independent sales agents collectively agreed to exclude the new entrant's product from the 1981 code by packing the annual meeting with new Association members whose only function was to vote against entrant's proposal. Over 280 members colluded to vote against the new entrant's product, the key motivation being that the new plastic conduits were much cheaper and would drive many of the metal-based conduit manufacturers out of the market. The Association members then proceeded to lobby local governments and other entities that the new plastic conduits were unsafe, posed fire hazards, when in fact none of this was true. The Association's coordinated action prevailed, resulting in harm to competition. The final decisions in this case came from the U.S. Supreme Court in 1988. Looking at this case in a bigger-picture sense, the collective action by the incumbents against the new entrant not only prevented consumers from immediately accessing a lower-priced plastic electrical conduit, but also affected the provision of variety and quality, and innovation, in the relevant market.

[3] Recent years have seen significant initiatives and enforcement activities in prosecuting cartels. The academic literature has also seen significant contributions in at least two broad areas. The first area relates to the fine-tuning of the carrots (e.g., leniency programs which provide incentives for firms to come clean with information to avoid penalties) and sticks (severity of penalties such as

In this paper I outline a specific proposal to enhance cartel enforcement, one that is somewhat different from the tools that are currently in use (noted in footnote 3). My proposal: sanction *direct* use of information and data revealed during *non*-cartel investigations (e.g., M&A reviews and monopolization/ dominance) to investigate and prosecute cartels. Currently, in several jurisdictions, information acquired in, for example, a M&A case typically cannot be *directly* used for a cartel prosecution. The underlying reasons relate to the statutes and the historical legal and administrative procedures typically being very different for *non*-cartel and cartel cases.

I argue that such a rule change, allowing information from *non*-cartel investigations and cases to be directly used to prosecute cartels, is likely to yield benefits that would result from the deterrence effect which may be high, and, under specific circumstances, be even larger than the monetary fines or corporate leniency mechanisms that have been instituted in many jurisdictions. The deterrence effect, in a strategic sense, implies that it is not particularly important precisely how many cartels might be prosecuted under such a rule change. The disincentive mechanism that is created may be sufficiently large to diminish formation and continuation of collusive agreements, and this may particularly be important for some of the larger firms and multinationals that are engaged in large-scale and damaging domestic and international collusive agreements. I argue that the proposal would open an additional, and potentially powerful, front in the fight against cartels.

The paper is structured as follows. In section 2, I briefly note the administrative and legal rules that apply to the direct use of information from *non*-cartel investigations to prosecute cartels. To develop my proposal, in section 3 I

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monetary fines, and incarceration in the US) approach to detection and enforcement. Aubert (2007), for example, provides an insightful discussion of leniency programs in various countries and the penalties versus rewards structure of deterrence programs and their effectiveness. Chen and Harrington (2007) theoretically examine the effects of leniency programs on the formation and stability of cartels. Buccirossi and Spagnolo (2007) present an analysis of the interaction between fines and leniency programs in deterrence. Connor (2007) examines fines and penalties imposed on modern international cartels and contributes to the current debate about the effectiveness of global antitrust sanctions to deter international price-fixing conduct. The OECD (2007) report provides details on the effectiveness of sanctions and the experiences of different countries. The second area provides insights into firms' behavior and the conditions that are conducive to the formation and stability of cartels. For example, Kovacic et al. (2007) infer that vitamins markets that were duopolies had significantly greater likelihood of collusion as opposed to those with greater number of firms. Levenstein and Suslow (2006) present information on market conditions that facilitate stability of cartels. Connor (2003 and 2006) presents details about conduct and market characteristics in the lysine, citric acid and vitamins cartels. Also, see Connor (2008), Dick (1998), Hammond (2008), Harding and Joshua (2004), Harrington (2008b) and Porter (2005) for discussion of related issues. Since these areas have a well known and extensive literature, I do not elaborate on the details here.

use the US antitrust enforcement context to examine the nature of information flows that give rise to cartel investigations, discuss confidentiality issues, and examine potential information spillovers from *non*-cartel investigations and cases to cartel cases under the existing mechanisms. Since the US has a long history of cartel enforcement, this jurisdiction serves as a useful example to highlight some of the issues that I consider in this paper.

To examine information spillovers, in section 4.1 I provide selected examples from competition law enforcement cases. To complement the discussion in section 4.1, in section 4.2 I present a brief analysis of US antitrust enforcement data over 1969-2009 to examine potential linkages between *non*-cartel and cartel investigations under existing mechanisms. While the empirical exercise in section 4.2 is to be treated as suggestive, my results indicate that an increase in past merger and monopolization, "civil", investigations and court cases filed lead to an increase in future cartel prosecutions. Taken at face value, the illustrative examples in section 4.1 and the cursory empirical analysis in section 4.2 provide suggestive information that at least some of the eventual cartel prosecutions have their true investigative information origins in *non*-cartel investigations. While the selected antitrust cases and the empirical results I present are suggestive, ultimately we know very little about the true origins of cartel investigations, and, in particular, the potential flows of information from *non*-cartel investigations to cartel investigations due to the stringent confidentiality restrictions that apply to such investigations.

In section 5, I spell out my proposal of sanctioning direct use of information and data revealed during *non*-cartel investigations to prosecute cartels. The proposal is designed to be used by any jurisdiction that has established competition laws and enforcement, as well as those countries that are, for the first time, designing their competition institutions, laws and enforcement mechanisms. Reviewing studies from the management and corporate strategy literatures, I note that M&As (along with joint-ventures and alliances), for example, form a vital part of firms' business strategy, with the longer-run strategic impacts being the dominant aspects. These strategies could be seriously jeopardized if the firms were engaging in collusion, as the likelihood of detection and prosecution would increase under the proposed rule change, which would fairly severely punish bad (collusive) behavior. I argue that irrespective of exactly how many cartels are actually prosecuted via this channel, the proposal has the likelihood of creating a meaningful deterrence effect. Finally, I end section 5 by discussing the potential downsides of the proposal by highlighting Type 1 errors (*false positives*) and the administrative and transactions costs that may arise from the proposal and rule change. Overall, I note that, under the proposed rule change, the effectiveness and efficiency of cartel enforcement is likely to increase, resulting in enhanced cartel enforcement. Section 6 presents some concluding

remarks.

2. Legal and administrative guidelines on the direct use of information from *non*-cartel investigations

In this section I briefly discuss details from selected jurisdictions to indicate the nature of the constraints related to the sharing of information. The issue of using *non*-cartel information to prosecute cartels is a complex one as many jurisdictions have explicit rules governing spillover and direct use of such information.

For European Commission competition law enforcement, for example, there is a clear distinction between use of data and information as *"intelligence"* versus *"direct use"* in evidence to prosecute cartels. Article 17(1) of the EC Merger Regulation provides that information collected under that regulation can only be used for the relevant request, investigation or hearing. This excludes direct use in an Article 101 or 102 TFEU investigation. The same is laid out in Article 28 of Regulation 1/2003 concerning the competition law procedure, where any information collected can only be used for the relevant procedure. Whereas, under EC laws, they cannot transfer evidence from one procedure to another, they can start a new procedure when significant suspicions are raised concerning a market in, for example, a merger investigation. The restriction of using the information coming from the merger investigation for, say, a cartel prosecution is a procedural rule, as merger and cartel investigations pursue different purposes and look at different situations. In the light of the ECJ judgment of 17 October 1989 in Case 85/87 Dow Benelux, it probably does not preclude the use as intelligence, allowing the same information to be collected again under a separate Article 101 or 102 TFEU investigation. The fact that EC has to collect new evidence for that procedure in a separate investigation will inevitably delay the eventual prosecution of a cartel, and may cause other procedural and investigative uncertainties.

Considering a very different jurisdiction, there are recent examples from the Competition Commission of South Africa where information revealed during merger investigations about cartel behavior could not be used directly to prosecute cartels. These relate to the recent cases in the plastic pipes and scrap metal industries).[4] Since the enforcement division of the South African Commission could not use the information provided by the merging parties directly in its investigations, the eventual cartel investigations took over 3 years to complete as independent inquiries. The existence of such administrative and legal procedural rules on direct and explicit use of information increases the transactions costs and inevitably delays prosecuting cartels.

[4] See OECD (2010) and Ngobeni (2010).

In the US, the US Department of Justice's Antitrust Division is tasked with cartel enforcement. From the US Department of Justice's Antitrust Guidelines, if information were to be revealed during a merger or monopolization investigation, the procedures explicitly instruct legal staff to clearly separate cartel (criminal) investigations from merger and monopolization (civil) investigations, and pursue independent lines of inquiry and investigations. The issues related to transactions costs, uncertainties and delays are similar to those noted above.

Turning to Taiwan, the Taiwan Fair Trade Commission could use the information from non-cartel cases to investigate cartel cases, with some administrative and legal barriers on the extent to which there is direct pass-through of the information from the *non*-cartel case to the cartel case. For example, in recent years, while investigating a complaint alleging predatory pricing in the Liquid Petroleum Gas market (the case of predatory pricing in the LPG market of Chia-yi area), the TFTC found suspected evidence on collusion and this lead to an ex-officio investigation on the matter.

In Japan, there are two levels of investigations: "Administrative Investigations" of cartels, and "Compulsory Investigations of Criminal Cases". It is not illegal to use information obtained in investigation of *non*-cartel cases for "Administrative" investigations. However, for "Compulsory" investigations, the investigators cannot use information which is obtained in investigation of *non*-cartel cases. It is controversial in terms of other kinds of laws (the Japanese Constitution, for example) to use those kinds of information in investigation of criminal cases of cartels. The most significant difference between Administrative investigations and Compulsory investigations of criminal cases is that in Compulsory investigations the investigators (with warrant of judges) can visit, search or seize suspected firms by direct compulsion, and finally can bring cases to the Attorney General who then files the cases in district court (and firms and/or individuals, engaging collusion, could be fined and sentenced in prison). In contrast, in Administrative investigations, the investigators can visit and search suspected firms by *"indirect"* enforcement, but the Commission, not the Attorney General, finally issues "the Cease and Desist Order" and "the Payment Order of Surcharge" to cartel firms.

The above information, as well as information from other jurisdictions, appear to reveal differences across jurisdictions in terms of the stringency of the constraint of using *non*-cartel investigations data to directly prosecute cartels. But in many important jurisdictions, there are clear rules that provide barriers to the flow of data and information directly from *non*-cartel to cartel cases and prosecutions. As I argue in section 5, altering these restrictions would lead to greater effectiveness and efficiency of cartel enforcement, potentially leading to meaningful welfare gains.

3. Information flows and cartel prosecutions

As noted in the introduction, since the US has a long history of cartel enforcement, I use information from this jurisdiction to highlight some of the core issues that I examine in this paper. As I note in section 6, many of the issues that I discuss below find common ground in cartel enforcement across other jurisdictions. The spirit of the analysis, the inferences I draw and the proposal I outlined, have relevance across international jurisdictions.

The origins of cartel investigations and the investigative procedures are considerably different from other types of investigations such as mergers and monopolization. For example, in the US it is mandatory for firms to file for a merger to be approved if the market value of the transaction is above the specified regulatory threshold. The specific merger approval filing rules and criteria vary across jurisdictions. The fact that a merger is being proposed is not a secret to the competition authority once the parties file for approval. The competition authority examines various issues related to market power, potential efficiencies, among others, and makes a determination on whether or not to challenge the merger. Mergers fall under a *rule of reason* criteria where the presumption is no significant market power resulting from the merger. If, based on the evidence and assessment, the competition authority infers otherwise, the merger can be challenged in court and/or remedies proposed. Monopolization (abuse of dominance) investigations result from potential behavioral violations of competitive conduct, and the vast majority of monopolization conduct also fall under rule of reason criteria.[5] In contrast to mergers, investigations in monopolization cases typically begin after evidence becomes available to the antitrust authority via complaints filed by other firms or buyers in the affected markets.

Cartels, in contrast to merger and monopolization cases, have been *per se* illegal in US antitrust for a very long time. Consider, for example, the case United States v. American Tobacco Co., 221 U.S. 106 (1911). The U.S. Department of Justice sued U.S. and British firms for domestic and global market allocation schemes, and the U.S. Supreme Court ruled that the conduct was illegal. Under current competition law enforcement regimes, cartels are illegal in most jurisdictions, but this was not so historically. Cartels are covert and pose significant problems of detection and, as evidenced by some of the high profile prosecutions in the lysine, vitamins, graphites, and numerous bid-rigging

[5] It is beyond the scope of this paper to discuss the changes in US and EC competition laws over time and which types of monopolization (dominance) conduct were always under rule of reason versus those that have had mixed legal and enforcement histories.

investigations, firms engaging in collusion can take elaborate precautions and have complicated schemes to avoid detection. The economy is very large comprising of tens and thousands of markets and firms, and the resources of the competition authority are quite limited, implying that it is simply not possible for them to launch an active campaign of using their own resources to detect cartels economy-wide. This may be an effective strategy in some sectors and in specific circumstances, but nearly impossible on a consistent and large-scale basis. This implies that information on potential collusive activity has to filter into the investigative offices of the competition authority from various sources such as competitors, customers and employees. Without this information, cartel enforcement would be very difficult and costly.

This raises the question of how do cartel investigations begin. In order to examine the true origins – *"seeds"* – of cartel investigations and prosecutions by the competition authority, one would need information on these information flows (i.e., original complaints by competitors, customers, among others). However, due to stringent confidentiality restrictions about the source of information that triggered an investigation, this information is not publicly available for the vast majority of cases. This poses considerable constraints on getting a clear picture of the underlying process of discovery of cartels and investigations.

The origins of cartel investigations by the antitrust authority can be myriad:

1. One cartel investigation may reveal information about other potential cartels in the same or related markets. For example, the US Antitrust Division's investigation of the lysine cartel involving Archer-Daniels Midlands and several Asian firms unearthed evidence on vitamin and related cartels leading to their prosecution including large multinationals like Hoffman-La Roche and Rhone-Poulenc. Bid-rigging in the construction industry appears pervasive and, in terms of investigative efforts, information revealed during one construction bid-rig often provide clues to other bid-rigs. Block and Feinstein (1986), for example, present evidence from the highway construction industry where the Antitrust Division prosecuted about 200 contractors on charges of bid-rigging. Bergeijk et al. (2007) provide related evidence from the Dutch construction industry.
2. Information provided by other firm(s) in the market. For example, in 1999 a settlement was reached in a milk price-fixing case where Marigold Foods, Land O' Lakes, Geo Benz and Sons, and Marigold Venture along with Dairies Trade Association were the accused. Origin of this investigation was information revealed by another firm in the market.
3. Dramatic price changes. Often, *prices wars* that break out between competitors may signal breakdown of potential collusive agreements.

Similarly rapid increase in prices or complaints by consumers about rising prices and suspicion of cartel-like activities. These have occurred in myriad products such as school milk contracts, electricity, local construction projects, gasoline, cable television, natural gas, airline pricing, among others. For example, in 2001, at the height of California's energy crisis, the price of natural gas spiked about 700% as it crossed the state line on an El Paso Corporation pipeline. This increase in price prompted complaints by various groups leading to judicial investigation and eventual prosecution. El Paso Corp. was accused to have entered secret deals – recorded in phone and other conversations – to cut out competitors and drive up prices. Subsequently when El Paso Corp. gave up control of the flow of gas, prices plummeted. During the same time period, the California Independent System Operator found that prices in 2000 were 10 times higher than in 1999 and the electric companies had withheld power through bidding strategies. In 1999, the Nevada Grocery Retailers filed a complaint with the State Dairy Association accusing local and regional dairies with collusion. In 2000, the Colorado Attorney's General office initiated an investigation into gasoline price fixing after receiving numerous complaints from local businesses and individuals of suspected collusion.

4. Information via the leniency program. There are many examples related to this, including the Sotheby's and Christie's auction house conspiracy, and the vitamins cartel where Rhone-Poulenc collaborated with the authorities to provide evidence against Hoffman La Roche and BASF.
5. Information uncovered while studying bidding patterns. For example, these have occurred in local or nation markets as part of government contracts and products have ranged from timber, military supplies, milk, petroleum, aluminum, construction projects and waste disposal.
6. Information discovered during the process of *non*-cartel (merger or monopolization) investigations may reveal information about cooperative pricing and market allocation schemes in affected markets. This is a rather complicated area and I return to more discussion regarding this in section 4.1 below.

The above points to the alternative sources of information that may lead to the genesis of cartel investigations. To get a complete picture of the investigative process, we also need to understand the timeline and stages of cartel investigations and prosecution process once information becomes available. While this investigative process varies considerably across different jurisdictions, I briefly note the main steps in the US process:

1. Depending on the nature of the initial information, a preliminary investigation is opened. If the initial information is credible and

compelling, the US Antitrust Division may start a federal grand jury investigation immediately. Once credible information becomes available, it may take between 3-6 months on average to get to the grand jury investigation stage. (The grand jury is rooted in centuries of Anglo-American history and it's role is to determine possible criminal violations of the federal laws and to return indictments against culpable corporations and individuals where there is probable cause to believe that a violation has occurred. It's proceedings are also designed to protect citizens against unfounded criminal prosecutions.)

2. The head of the Antitrust Division has to sign off on a grand jury investigation. The grand jury comprises of a group of several individuals who become privy to the confidential information that forms part of the Antitrust Division's case. The investigation begins with the Antitrust Division issuing subpoenas for documents. Since the process is confidential, sometimes the grand jury deliberations may be the first time the defendant hears about the accusations leveled by the Antitrust Division. If, on completion of the grand jury hearings, there is ample evidence, the Antitrust Division prepares a draft indictment. The Assistant Attorney General of the Antitrust Division makes the final decision on whether or not to indict certain individuals. The actual grand jury proceedings may take some time. If an investigation has been approved by the Antitrust Division, but the grand jury has not convened as yet, it is listed as *pending*. Between the previous stage and this one, it may take about 6-9 months on average.
3. If the grand jury returns an *indictment*, the case goes to court under the Speedy Trial Act for criminal investigations. Between the indictment and the case going to trial, the time lapse is typically about 3-4 months.
4. The stages in court, for example, include: (a) determining guilt; (b) assessing the volume of commerce involved and assessing liabilities; and (c) sentencing – penalties, fine, jail terms. Once the case goes to court, on average it takes 1-2 weeks for the trial to be over. (In a very small number of cases, there is settlement – preceded by what is called information filing – leading to a consent decree.)

Overall, from when the information first becomes available to the conclusion of the case, on average it may take the US authorities between 18-24 months to collect the required evidence and prosecute cartel cases; in some cases, of course, the investigation may proceed faster while others may take more time. As noted earlier, while the above briefly describes the US process, the administrative and legal procedures, and timeline of investigation, will vary considerably across different international jurisdictions.

4. Information spillovers from *non*-cartel cases and investigations to cartel cases

As I noted in section 3, there are various sources of *"seed"* information that might lead to detection of cartels and prosecution. My focus in this paper is on the last potential source: "*Potential information spillovers from non-cartel (M&A and monopolization) investigations and cases that may provide the initial seed information for eventual cartel investigations and prosecutions."* In this section I provide illustrative examples from the US and other jurisdictions to highlight this issue.

For several reasons, this is a very difficult area to get information on. First, the US Antitrust Division provides no public records of information about the origins of cartel investigations due to stringent confidentiality restrictions.[6] While sketchy information is available in selected high profile cases, the inner workings of the cartel investigations are closely guarded due to litigation and other factors. Similar, stringent, confidentiality restrictions apply to most of the advanced jurisdictions.

Second, there are protections afforded to the targets of cartel investigations, due to the *per se*, criminal, nature of the offense. Due to this, the Antitrust Division must make a call fairly early on whether to proceed with a *non*-cartel or cartel investigation. Given this, even if initial information available in a *non*-cartel case leads to the transition to a cartel case and results in a cartel prosecution, the publicly filed indictment and supporting papers are highly unlikely to reveal that the matter originated as a *non*-cartel investigation. Even if the merger or monopolization investigation staffs at the Antitrust Division discover evidence of cartel violations, they have to *transition* the matter to criminal (cartel) investigation status without tainting either investigation. Given these complexities and confidentiality issues, finding examples in this area proved extremely difficult.[7] Below, I pursue a two-part approach to providing some

[6] Even though I worked at the US Antitrust Division for several years, obtaining this information proved very hard. The strict confidentiality restrictions on information sources, likely accused, investigative procedures, etc, preclude availability of this information. Anecdotal information and word-of-mouth are more common.

[7] On the broader issue of information spillovers, they are quite common particularly within investigation categories. In section 3 (item #1) I noted spillovers from criminal to criminal. For other types of investigations, for example, the Antitrust Division while evaluating the pending merger between First Data Inc. and Concord EFS Inc. discovered evidence on exclusivity contracts between Western Union Financial Services Inc. and retail outlets which prevent competitors from setting up money-transfer systems at those outlets. This lead the Antitrust Division to start an investigation of Western Union and issue Civil Investigative Demands. See: "Western Union Gets DoJ CID," *Wall Street Journal*, February 5, 2004; and "Exclusivity Pacts By Western Union At Stake in Probe," *Wall Street Journal*, February 9, 2004.

insights. In section 4.1 I provide illustrative examples from cases in the US and other jurisdictions. And, in section 4.2, I present an empirical analysis of the linkages between non-cartel and cartel cases using US antitrust enforcement data.

4.1 Illustrative examples from competition law enforcement cases

In spite of the stringent confidentiality restrictions noted above, I was able to come up with some illustrative examples available in the public domain:

1. The US Antitrust Division's successful challenge of the UPM Kymmene-Bemis MACtac merger several years back. It spawned a grand jury investigation into alleged price fixing;
2. The US Antitrust Division's investigation of the proposed Formica-International Paper (Nevamar Division) merger – the Antitrust Division announced plans to challenge it, and the parties broke up the deal the next day. It spawned a grand jury price-fixing case against a competitor called WilsonArt which ended with a guilty plea on some of the charges; and
3. The US Federal Trade Commission's "3 Tenors" case which came out of an HSR investigation of a proposed merger between Time Warner & EMI. The contracts that ultimately were challenged were discovered during the HSR (merger) investigation.

Regarding other jurisdictions, stringent restrictions on information conveyed to the public domain prevent a meaningful summary, but I was able to gather some evidence on information spillovers from non-cartel investigations resulting in cartel investigations and prosecutions. For example:

1. The relatively recent non-cartel investigations at the Competition Commission of South Africa in the plastic pipes and scrap metal industries, which ultimately lead to cartel investigations and prosecutions (OECD, 2010; and Ngobeni, 2010);
2. At the Taiwan FTC, a recent investigation into a complaint alleging predatory pricing in the LPG market lead to an ex officio cartel investigation on the matter; and
3. In a somewhat different case involving a complex international transaction, the hostile bid launched by the Australian company BHP Billiton for takeover of Canadian firm Potash Corp., and the subsequent close scrutiny and analysis of this acquisition (a non-cartel investigation), brought to the forefront more details of the inner workings of the Canadian/global Potash cartel.[8]

While the above examples provide only a narrow window of information on the issue due to stringent confidentiality restrictions, even under existing

[8] For example, see the commentary by Dvorak and Kilman (2010) and Jenny (2010a, 2010b).

relatively high barriers for information flows from *non*-cartel to cartel investigations, we have examples that the *non*-cartel area of competition law investigations generating useful information for investigation of cartels.

4.2 Empirical examination of potential linkages between *non*-cartel and cartel cases

In section 4.1 I provided some illustrative examples on the linkages between *non*-cartel and cartel cases, and noted the considerable difficulty of obtaining credible and accurate evidence on the extent to which information obtained during *non*-cartel investigations provided a conduit – or *seed* information – for cartel investigations and prosecutions. Much of the problems in trying to understand this issue arises from the stringent confidentiality restrictions, and the information available is sparse and anecdotal.

In this section I pursue a complementary approach, by using publicly available data on various types of US *non*-cartel investigations and cases, and cartel investigations and prosecutions, to empirically examine whether, in the broader publicly available data, there is any suggestive evidence of linkages between *non*-cartel investigations and cases, and cartel enforcement. To examine this, the question I pose is: *Do increases in non-cartel enforcement (investigations, cases filed in court) show any link to subsequent cartel enforcement?* As in section 4.1, this analysis is only meant to be suggestive of the potential linkages.

4.2.1 Antitrust enforcement data

The data on antitrust enforcement are from the U.S. Antitrust Division's historical statistics over the period 1969-2009. Including earlier years was problematic as data were not available for some of the key variables I use. The enforcement data are on variables such as total cartel prosecutions (court cases),[9] number of cartel grand jury investigations, the number of firms and individuals prosecuted, merger and monopolization investigations and court cases, as well as the extent of funding allocated to the Antitrust Division. Table 1 summarizes the data used in the empirical analysis and presents summary statistics, and figures 1-3 display three important variables related to cartel investigations and prosecutions. The standard deviations relative to the mean values in table 1, and the data in figures

[9] The data on the total number of criminal (cartel) cases prosecuted are the data on the total number of criminal court cases filed by the Antitrust Division *minus* miscellaneous criminal cases filed by the Antitrust Division related to obstruction of justice, false statements, mail fraud and perjury. This "correction" is important because the latter class of criminal cases have little to do with price-fixing and related violations which we are interested in.

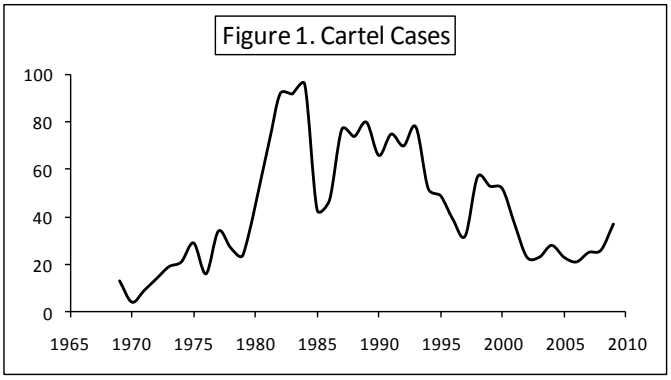
1-3, show fairly significant intertemporal fluctuations. The data on cartel cases (figure 1) show a markedly higher number of prosecutions during the 1980s, and then reverting to a somewhat lower mean in the 1990s, but still much higher than in the 1960s and 1970s.

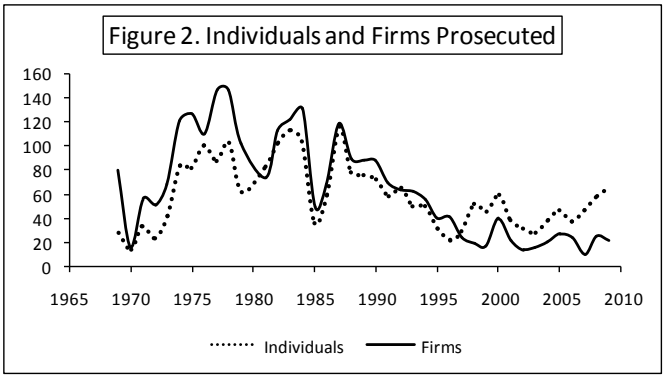
Table 1. Variables and summary statistics

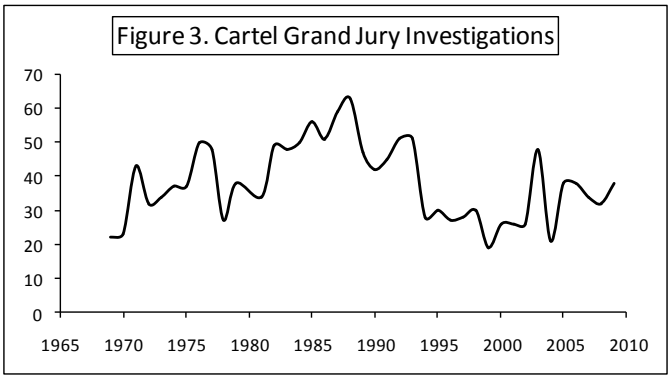
Variable	Mean	Std. Dev.
Cartel *Cartel court cases*	46.65	25.62
Indivs_Pros *Individuals prosecuted*	59.00	27.54
Firms_Pros *Firms prosecuted*	64.53	41.77
Civil_Invs *Civil investigations*	281.92	104.52
Civil_Cases *Civil cases filed in court*	22.47	15.23
GJInvs *Grand jury investigations*	38.15	11.35
GDP *Real GDP growth*	0.03	0.02

Notes:

1. The data are annual and the time-period for all variables is 1969-2009.
2. *Civil* investigations and cases include mergers and monopolization.
3. Mean value of GDP growth is very small compared to the dependent variables, implying that, in the estimated regressions, the point estimates of the GDP growth will have a large scaling effect.







4.2.2 Examining the link between *non*-cartel and cartel cases

The variables used in the empirical analysis are noted in table 1. I use the partial-adjustment framework to specify the empirical equation to examine the intertemporal time-path of cartel enforcement and some of its determinants. The partial-adjustment mechanism is written as $Cartel_t - Cartel_{t-1} = \lambda(Cartel_t^* - Cartel_{t-1})$, where $Cartel_t$ is the actual number of cartel cases in time t and $Cartel_t^*$ is the optimal (or desired) number of cases. The actual change in the number of cartel cases from one period to the next is a fraction $\lambda \in [0,1]$ of the optimal (or desired) change. The parameter λ typically being a fraction implies that there is slow, or partial, adjustment to the optimal target. In theory, the partial-adjustment parameter λ is a function of the underlying adjustment and disequilibrium costs.[10] The above expression can be re-written as:

[10] The partial-adjustment equation is derived from a quadratic cost-minimizing framework. In this framework, the decision-maker's objective is to minimize the expected present value of a quadratic loss function subject to adjustment and disequilibrium costs. The theoretical and empirical underpinnings of the framework are well documented in Gould (1968), Kennan (1979)

(1) $Cartel_t = (1-\lambda)Cartel_{t-1} + \lambda Cartel_t^*$

One can think of adjustment and disequilibrium costs arising for the antitrust decision-maker as follows. First, the Antitrust Division (or any Competition Authority) may potentially face monetary and non-monetary constraints, related to attorneys, support staff, economists and budgets, to undertake cartel as well as *non*-cartel (mergers, monopolization, restraints of trade) investigations. The number of cartel investigations the Antitrust Division pursues, and consequently the number of prosecutions, may end up being less than the optimal number due to such constraints.

Second, consider a situation where the economy has numerous price-fixing conspiracies that result in higher prices, but the Antitrust Division is not vigorously pursuing cartel investigations. This could arise either because the Antitrust Division is pre-occupied with other types of investigations, uninformed and unaware of these violations, that its current stance is one of less focus on cartel matters, or current stance is to focus mainly on specific types of cartels. The rise in prices often lead consumers to complain to their congressmen, senators and other interest groups, with calls for greater action and investigations.[11] Therefore, there is a tendency for correction if there is disequilibrium in the number of cartel cases pursued.

At the other end of the spectrum, suppose there is excessive activity by the Antitrust Division in terms of prosecuting companies for price-fixing and related behavior. Producer groups may lobby the legislators to have the Antitrust Division back off. Since being out of equilibrium in the intensity of cartel enforcement implies greater scrutiny, the Antitrust Division may have to take corrective action if the current level of enforcement is either too little or too much.

Thus, in our context, I assume that the Antitrust Division pursues cartel investigations and prosecutions subject to minimizing these two costs and makes a sequence of actual $Cartel_t$ decisions designed to meet the optimal target $Cartel_t^*$, which is a function of relevant driving variables noted below.

Next, the optimal target, $Cartel_t^*$, is modeled as a function of the relevant driving variables. Some of the variables I consider are:

1. Are we in a high or low cartel enforcement *Regime*? The regime issue is noted in several papers: see, for example, Ghosal (2008a, 2011), Ghosal,

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and Treadway (1971). For more details, see Ghosal (2008a, 2011) who uses this procedure to model intertemporal movements in antitrust cases related to M&As, monopolization and cartels.

[11] As examples, some of the markets in the US where these have occurred include, for example, retail gasoline, cable TV, airline, building contracts, school milk and lunch contracts, government procurement contracts, among others.

Harrington and Stennek (2007). The broad picture for US cartel enforcement is that there was a regime change in the late-1970s and early-1980s, with significantly greater emphasis on clamping down on cartels. There were broader shifts in intellectual thinking about cartel enforcement and the political willingness to prosecute, and the focus of enforcement shifted to areas where there was likely to be clearer harm to welfare such as collusion.[12] This period also roughly coincides with the corporate leniency programs that were introduced in the US in 1978 and were refined further over several years, culminating in a major revision in 1993.[13] The econometric analysis in Ghosal (2008a) reveals a clear statistical break in the cartel enforcement data in 1980.

2. The *pipeline of investigations* into collusive activity. One variable that would capture this would be the number of grand jury investigations, which was discussed earlier in section 3.
3. The *extent of non-cartel investigations and prosecutions*. As noted in the discussion in section 4.1, I view this as one of the potential sources of seed information that might lead to eventual cartel investigations and prosecutions.
4. The *level of economic activity* in the economy. Economic conditions can be a conduit for information flows about collusive activity. In some instances information may flow into the Antitrust Division's investigative offices when cartels break down, and, in other instances, when they are formed with consequent increases in prices. The conventional view on the link between economic conditions and collusive agreements is summarized in Scherer (1980, p.206) who notes that: *"there is evidence that industries characterized by high overhead costs are particularly susceptible to pricing discipline breakdowns when a cyclical or secular decline in demand forces member firms to operate well below designed plant capacity."* He provides examples from industries such as cement, mining, chemicals, steel and aluminum. According to this view, collusion is likely to break down during periods of low demand. Levenstein and Suslow (2006) review a number of studies and note that cheating and negative external shocks appear to be important contributors to cartel breakdowns.[14] Overall, the conclusion one can draw is that adverse

[12] Discussion of these issues along with empirical evidence are contained in, for example, Baker (2002, 2003), Crandall and Winston (2003), Kovacic and Shapiro (2000), Ghosal (2008a, 2011), Ghosal and Gallo (2001) and Ghosal, Harrington and Stennek (2007).

[13] See, for example, Griffin (2003), Harrington (2008a), Hunton and Williams (2003), Kobayashi (2001), Kolaski (2002), Klein (1999), Motta (2004, p.192-194) and Paul (2000) note the various facets and effectiveness of the program.

[14] In terms of duration, Levenstein and Suslow note that the precise timing of the start and end of cartels is extremely hard to pin down. In terms of the evidence they compiled, cartels typically

economic conditions may be ripe for cartel breakdowns. And since cartel breakdowns are one of the channels via which the Antitrust Division may get information about collusive activity, including a measure of economic activity is meaningful and consistent with the previous literature.

5. Other factors. These include, for example, the *Party of the US President* (Republican or Democrat). Numerous studies have examined this: see reviews of this literature in Ghosal (2006, 2008a, 2011), Ghosal and Gallo (2001) and Ghosal, Harrington and Stennek (2007). The key premise is that the Head of the Antitrust Division is appointed by the President. To the extent that political preferences matter, this variable would capture this effect. Another potential variable is the *level of funding* for the Antitrust Division. The literature shows that the level of funding does not have any consistent relationship to the cases filed. Part of this is undoubtedly due to the fact that the Antitrust Division has a baseline budget, one that is reported in the appropriations statistics. In addition, for cartel prosecutions, hiring of experts, among other key litigation driven activities, there is supplemental budget requests and funds. These data are not readily available on a consistent basis and cannot be included in standard regressions. The baseline annual funding figures that we have access to do not seem to be well connected to actual cases filed in court and prosecuted.[15]

Next, I focus on the timing of the effects. In section 3 I described the process of investigations and prosecutions, and time lags. Given this, I assume that most of the relevant factors may take some time to impact the number of prosecutions, suggesting the use of distributed-lag models. One of the variables that is expected to potentially take less time is the number of grand jury investigations. Once the investigations are completed, proceeding to trial can occur quite rapidly. Since data on precise timing of start and end dates for grand juries are not available, I include both current-period as well as lagged effects for grand jury proceedings.

With these considerations in mind, and replacing $Cartel_t^*$ with the above-mentioned driving variables and their lagged values, the full specification, which takes the form of an *autoregressive-distributed* lag model, is written as:

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have lasted between 3 to 8 years. Of the cartels during the 1990s for which they have evidence, the average duration was about 5.4 years with a standard deviation of 4.7 years. Further evidence is provided by Baker (1989), Dick (1996) and Suslow (1988).

[15] See Ghosal and Gallo (2001) and Ghosal (2006, 2008a, 2011) for discussion and empirical results on the linkages between funding and the enforcement variables.

$$(2)\quad Cartel_t = c_0 + \alpha Regime_t + \sum_{i=1}^{2}[\beta_i Cartel_{t-i} + \delta_i Civil\_(.)_{t-i} + \gamma_i Econ_{t-i} + \theta_i Funds_{t-i}] + \sum_{j=0}^{2}[\xi_j GJInvs_{t-j}] + \tau Pres_{t-1} + \varepsilon_t$$

In the above specification, *Cartel* refers to the total number of cartel cases filed in court. The variable *Regime* refers to the regime shift dummy which (based on the earlier discussion) takes value 1 for years ≥1980 and 0 otherwise. The civil enforcement variable *Civil_(.)* can be one of two effects: (a) *Civil_Invs*, the total number of civil investigations; or (b) *Civil_Cases*, the total number of civil cases filed in Court. The variables *Econ* and *Funds* refer to real GDP growth and the level of funding for the Antitrust Division, respectively. The *grand jury* variable *GJInvs* is the total number of cartel grand jury investigations. Finally, *President* is a dummy variable that takes value 1 if there is a Republican President and 0 if Democrat. Due to the reasons noted earlier about the potential timing of grand juries and cases filed in Court, the grand jury variable *GJInvs* is entered for the current period as well as two lags. The other time series variables are entered as lags one and two as those information effects are expected to take time to materialize into investigations and cases filed in court.[16]

4.2.3 Estimation results

The estimates from specification (2) appear in table 2. The lags were generally dropped if they were insignificant. For example, the GDP_{-2} and $Cartel_{-2}$ coefficients were always insignificant, so they were dropped. If in some specifications the second lag was significant but not the others, then I keep the second lag even if it was insignificant; this is the case, for example, for the *Civil_(.)* variables and the *GJInvs* variable. The first-lags were always included in the estimation even if it was insignificant. The President and Funds variables had

[16] Here I use the partial-adjustment framework to guide the empirical specification. The alternative methods would include formulating a structural model of competition authority's decision-making and estimate the resulting structural parameters. However, the antitrust enforcement data available are rather aggregated and largely preclude us from estimating a structural model. Another alternative would be to estimate simultaneous-equation systems, for example Zellner's seemingly-unrelated framework, vector-autoregression models, among others. In previous analysis, Ghosal (2008a) uses antitrust enforcement data till 2002 and presents estimates with alternative methodologies. The results with the earlier data are similar in spirit to those presented in this paper. Since the primary purpose of this paper is to lay out the arguments for a policy proposal, I do not revisit the more technical econometric discussion, methods and results presented in Ghosal (2008a).

no impact (statistical significance, or effects on the other estimates) in the estimated equations; to save degrees of freedom (and clutter in the table), I do not report these in the table 2.[17]

Table 2. Dependent variable: total cartel cases filed in court

	Column 1	**Column 2**
Intercept	-114.029*	-80.699*
	(0.001)	(0.001)
Regime	46.871*	50.083*
Dummy=1 if year≥1980	(0.002)	(0.003)
$Cartel_{-1}$	0.542*	0.384*
	(0.001)	(0.027)
$Civil\_Invs_{-1}$	0.075*	-
	(0.095)	
$Civil\_Invs_{-2}$	0.117*	-
	(0.002)	
$Civil\_Case_{-1}$	-	0.419[§]
		(0.103)
$Civil\_Case_{-2}$	-	0.766*
		(0.019)
GJInvs	0.452*	0.435*
	(0.056)	(0.039)
$GJInvs_{-1}$	0.474*	0.367*
	(0.020)	(0.085)
$GJInvs_{-2}$	0.417	0.491*
	(0.155)	(0.091)
GDP_{-1}	-243.153	-204.752
	(0.179)	(0.201)
Obs.	40	40
Adj-R^2	0.725	0.727
P	-0.008	0.041
DW	2.002	1.917

Notes:

1. All data cover the period 1969-2009.
2. *p-values* computed from two-tailed heteroscedasticity and autocorrelation robust standard errors (Newey and West, 1987) are in parentheses. An * denotes statistical significance at least at the 10% level and a [§] at the 10%-15% level. The first-order autocorrelation coefficient is denoted by ρ, and DW is the Durbin-Watson statistic.
3. The point estimates for GDP are large due to scaling effects; GDP growth values are very small compared to the means of the explanatory variables (see table 1).
4. As noted in the text, I experimented with other effects: (a) deeper lags of the explanatory variables; (b) including Antitrust Divisions baseline level of funding; and (c) including a dummy

[17] The literature on the effects of the two variables, President and Funding, are overviewed in Ghosal and Gallo (2001) and Ghosal (2006, 2008a, 2011).

variable for the President. These did not alter the inferences. These results are similar in spirit to those using enforcement data till 2002 in Ghosal (2008a), in the sense that the qualitative relationship between civil and criminal cases is not affected by various checks for robustness, or alternative methods for estimation.

The numbers in table 2 are the raw estimates. However, as we note from the summary statistics presented in table 1, the means and standard deviations of the variables vary considerably for the variables in our model. To get a better glimpse of the implied quantitative effects, in table 3 I present the estimates reported in table 2 multiplied by the variable's *one-standard-deviation* reported in table 1. To focus on the main objectives of the paper, I only report the numbers for *Civil_Invs*, *Civil_Cases*, *GJInvs* and *GDP*. The statistical significance, *p-values*, noted in table 3 are the same as those in table 2.

Table 3. Implied quantitative effects

	Column 1	**Column 2**
$Civil\_Invs_{-1}$	7.84*	-
	(0.095)	
$Civil\_Invs_{-2}$	12.23*	-
	(0.002)	
$Civil\_Case_{-1}$	-	6.38[§]
		(0.103)
$Civil\_Case_{-2}$	-	11.67*
		(0.019)
GJInvs	5.13*	4.94*
	(0.056)	(0.039)
$GJInvs_{-1}$	5.38*	4.16*
	(0.020)	(0.085)
$GJInvs_{-2}$	4.73	5.57*
	(0.155)	(0.091)
GDP_{-1}	-4.86	-4.09
	(0.179)	(0.201)

Notes:

1. The numbers above are the estimates from table 2 multiplied by *one-standard-deviation* of the variables (from table 1). The reported *p-values* are the same as those in table 2.

The key findings from tables 2 and 3 can be summarized as follows:

1. The *Civil_Invs* and *Civil_Case* variables are statistically significant and have a positive effect on cartel investigation and court cases. For *Civil_Invs*, the second-lag is measured more precisely statistically, and has a larger quantitative effect than the first-lag. For *Civil_Case*, the first-lag has marginal significance at 10.3%, but similar to *Civil_Invs*, the second lag for *Civil_Case* is highly significant and has a greater quantitative

effect. Overall, while there are marginal differences, the inferences we draw from using *Civil_Invs* or *Civil_Case* are similar in spirit. The fact that the second-lags are more significant and are quantitatively larger is somewhat reassuring as we expect the information flows and subsequent investigations and prosecutions to take time (see section 3). The fact that the *Civil_(.)* variables are statistically significant even after controlling a range of other relevant variables, is reassuring. Turning to the implied quantitative effects in table 3, they show that, starting from mean values of the respective variables, if there is a ***one-standard-deviation*** increase in the *Civil_(.)* variables, this would result in between 18-20 additional cartel cases over a 2-3 year period. While these empirical results are only meant to be suggestive, for the purposes of my paper the effects of the *Civil_(.)* variables are intriguing. Literally interpreted, this implies that at least some of the cartel prosecutions have their roots in information unearthed during civil investigations and enforcement actions.[18]

2. Grand jury investigations lead to increase in cartel prosecutions. In the two models estimated in table 2, current as well as lags of grand jury investigations affect current cartel cases. While this is an expected result based on the pipeline of investigations argument (noted in bullet point 2, section 4.2.3), the estimates offer insights into the magnitude and timing (current and lags) of the effects. Considering the effects in table 3, a ***one-standard-deviation*** increase in grand jury investigations, *GJInvs*, leads to approximately 15 additional cartel cases over a 2-3 year period.
3. Given the estimated coefficient on the lagged-dependent variable, there is persistence in cartel cases filed in court. In other words, more cartel cases filed this year, typically lead to more cases filed next year. Based on the comments noted in section 3 (bullet point #1 in origins of cartel investigations), this is an expected result, as there is a fair amount of evidence on spillover effects and follow-on investigations and prosecutions.
4. The estimated coefficient on GDP growth is negative, which lends some support for the Scherer (1980) and Levenstein and Suslow (2006) conjectures and findings. But the point estimates of GDP are not statistically significant at standard levels. This relative lack of statistical significance is in contrast to Ghosal (2008a) where the GDP effect was negative and statistically significant. Since the cyclical effects are not the

[18] In this paper I use data up to the most recent year that was available (i.e., 2009) when I started working on this paper. In an earlier study (Ghosal, 2008a), I present findings using data till 2002 and using alternate methodologies and variables. The findings presented above are similar in spirit to those obtained with earlier data, up to 2002. The consistency of these results using more recent data is reassuring.

main focus of this paper, I do not discuss this further.

While I don't present the tables using individuals and firms prosecuted as the dependent variables, those results and inferences are similar in spirit to the results presented in tables 2 and 3. For more elaborate econometric analysis of these dynamics using antitrust enforcement data up to 2002, see Ghosal (2008a).

The findings from the estimation in tables 2 and 3 can be summarized as follows. First, they provide some evidence that a greater number of *non*-cartel investigations and cases lead to an increase in cartel cases and prosecutions. This appears to indicate that *non*-cartel investigations provide at least some of the valuable "*seed"* information for cartel cases. Second, this econometric result appears roughly consistent with the anecdotal information and illustrative examples provided in section 4.1, which pointed to specific case-related information on information spillovers from the *non*-cartel to cartel areas of competition law enforcement. Overall, while there is some evidence under existing administrative and legal structures for information spillovers from *non*-cartel to cartel investigations, undoubtedly the restrictive legal and administrative processes constrain the extent of *"information mining"* that can be conducted from all the information contained in the *non*-cartel investigations.

5. A proposal to enhance cartel enforcement

In sections 4.1 and 4.2 I provided some insights into the potential linkages between *non*-cartel investigations and cases, and cartel prosecutions. In section 2, I noted that many jurisdictions have explicit administrative and legal rules that prohibit the *direct* use of information from a *non*-cartel case to prosecute cartels. While these restrictions do not necessarily prevent the eventual prosecution of cartels from such information as the information could potentially be re-gathered as part of a separate independent investigation, they can cause significant delays and inject administrative and legal uncertainty into the subsequent investigations.[19] A change in rules can potentially increase the efficiency and effectiveness of cartel enforcement.

In this section, I first discuss some of the key aspects of M&As as noted in the management, corporate strategy and economics literatures. Mainly, I emphasize that M&As can have far-reaching longer-run benefits than are commonly portrayed in some of the literature. If we examine the totality of the effects that may arise from M&As, the benefits appear considerably larger than made out in those studies that assess the relatively shorter-run profit effects of

[19] For example, the relatively recent non-cartel investigations at South Africa's Competition Commission in the plastic pipes and scrap metal industries, which ultimately lead to cartel investigations and prosecutions (OECD, 2010; and Ngobeni, 2010), highlights some of the problems.

M&As. Next, I spell out the proposal, and discuss the incentive issues and benefits of the proposal. The proposal described noted below is general and designed to be considered by any jurisdiction. Given the significance of M&As in firms' shorter and, more importantly, longer-run business strategies, I argue that if a penalty (as defined by the proposal) is imposed on bad behavior (i.e., collusion), it may have an important deterrent effect on firms' incentives to form cartels. I end this section by discussing the potential downsides of the proposal.

5.1 Importance of M&As in firms' overall business strategy

According to Thomson Financial, in the year 2000, globally firms spent about $3.5 trillion in M&As. In 2008, with a significant economic downturn, global M&As were valued at about $3 trillion, down from about $4 trillion in 2007. For comparison, Germany's GDP in 2009 was about $3.4 trillion. The US economy itself sees several thousand M&As per year, often more than 8-10 thousand per year. The fact that firms engage in such a large volume of M&As every year indicates that they must be an important part of their strategic business decisions.

Firms engage in M&As for a variety of reasons and it is important to recognize that the underlying objectives include meeting their shorter-term and/or longer-term strategic goals. A more comprehensive understanding of M&As is required to highlight their importance for firms' business strategies. As has been noted in the literature, some of the motivations for M&As include:

1. Obtaining new knowledge about products and processes, and skills, including acquiring key technical personnel. Here M&As can act as substitute for firms' R&D expenditures and innovation investments;
2. Entering new product or geographic market segments. These often relate to strategies for actual or potential (or exploratory) diversification and differentiation;
3. Enhancing production capacity. This can be thought of as a pure physical investment objective;
4. Reallocation of potentially valuable and productive assets into the hands of more able managers;
5. Response to changes in market rules and regulations; and
6. Empire building or hubris.

For the purposes of illustration and to highlight a key aspect, below I only focus on the first type (above) which can be broadly classified as *knowledge-based M&As*., while noting that the essence of the arguments I make can also be made for other motivations for M&As (items 2-5 above). The literature on R&D and innovation motivated M&As, for example, notes that the technological performance and benefits of such M&As are expected to reveal themselves only

in the longer-run.[20] It is precisely these longer-run effects on firms' strategic variables that are likely to be underestimated in the typical evaluation of M&As which often tends to focus on the shorter-term economic effects related to profits.[21] In the longer-run, synergies between the companies can contribute to technological performance and progress, and result in process and product innovations. Some of these new innovations can, in the longer-run, lead to improved performance and firms' position in the market in a dynamic context.

Equally important, even when we may observe no post-M&A upward trajectory in a firm's profit or market-share position, the key knowledge-based M&As can help stem potential future declines in a firm's market position. In other words, had the knowledge-based M&A not taken place, we would have seen declines in profits and market shares, but since we do not observe the counterfactual, we may tend to view such M&As as not being important.

In some instances, there may, of course, be shorter-run benefits when the acquiring firm obtains access to R&D and technological capabilities to produce an existing, combined technological output. If the capabilities emanating from such M&As, however, are used in the development of new technological output, the shorter-term effects can be quite negligible in comparison to the longer-term technological benefits.

The complex technological effects of M&As in high-tech sectors have been studied extensively in the innovation and management literatures where increased size of companies and synergies, through internal growth or by means of M&As, are positively related to longer-term technological performance, and better strategic positioning of the firms. Di Guardo and Valentini (2007), for example, note that the effects of M&As on firms' technological performance are complex as they simultaneously alter the resources firms can use in their innovation process as well as the incentive structure related to the innovation process. Hagedoorn and Duysters (2002), for example, study the global computer industry and find that linking up to more R&D intensive companies generates strong results in terms of higher technological performance. They argue that R&D intensive M&As are instrumental to the more general process of "*exploratory"* learning and play an important role in the improvement of technological competencies that are crucial for companies to remain competitive in a high-tech environment.

Similarly, if we examine the treatment of cross-border mergers in the corporate strategy literature, it has somewhat of a different take than in the economics literature. Shimizu, Hitt, Vaidyanath and Pisano (2004), for example,

[20] See, for example, Chakrabarti, Hauschildt and Sueverkruep (1994), Hagedoorn and Duysters (2002), Gerpott (1995) and Grandstrand, Bohlin, Oskarsson and Sjoberg (1992), Hitt, Hoskisson, Ireland and Harrison (1991), Hitt, Hoskisson, Johnson and Moesel (1996) and Oster (1994).
[21] See, for example, Caves (1989), Cosh, Hughes, Lee and Singh (1989), and Paulter (2003).

present a detailed assessment of the theoretical and empirical management literature. They argue that cross-border M&As can be used to access new and lucrative markets, expand the market for a firm's current goods, take advantage of a new opportunities, to avoid a possible future threat, and as an opportunities to acquire learn new knowledge and capabilities. Arguably, many of the important aspects of these effects are likely to reveal themselves in the acquiring firms' longer-run opportunity set as opposed to pure short-term benefits.

For the purposes of my paper, I summarize the M&A issue as follows. There is a clear belief in both the management and economics literatures that many M&A activities remain unsuccessful. The reported failure rates are estimated to be anywhere between 50% to 80%.[22] However, the reported broad failure and survival statistics often miss the nuances that differentiate different types of M&As and the specific effects, making it difficult to truly assess the strategic importance of M&As. I briefly discuss some findings to highlight this.

Walker (2000), for example, investigates the strategic objectives and the specifics of the transactions details and how they affect performance of the acquiring firms. He finds that the acquiring-firms' shareholders earn higher returns as a result of takeovers that expand the firm's operations geographically, and that shareholders of the acquiring-firm earn higher returns following "cash offers". Homburg and Bucerius (2006) focus on the speed of post-merger integration. Their findings, from a survey of 232 horizontal M&As show that speed is most beneficial when external relatedness is low and at the same time internal relatedness is high. In contrast, speed is highly detrimental in the case of low internal and high external relatedness. Cloodt, Hagedoorn and van Kranenburg (2006) examine the post-M&A performance of acquiring firms in four major high-tech sectors. They find that non-technological M&As appear to have a negative impact on the acquiring firm's post-M&A innovative performance, while for technological M&As a large relative size of the acquired knowledge base reduces the innovative performance of the acquiring firm.

Focarelli, Panetta and Salleo (2002) examine the financial services markets and find that expanding revenues from financial services is a strategic objective for "mergers", whereas improving the quality of the loan portfolio is central for "acquisitions". Selling more services seems to require a merger, that is, a takeover of the target bank followed by a full integration of its marketing network with that of the bidder. When the objective of improving the passive bank's loan portfolio is crucial, the purchase of a controlling stake seems sufficient to transfer superior lending competence from the active to the passive bank, thus avoiding the high costs that usually accompany full integration. Empirical results in Cummins and Xie (2008) indicate that M&As in property-

[22] For example, see Andrade, Mitchell and Stafford (2001), Marks and Mirvis (2001) and Tetenbaum (1999). Peltier (2004) presents some interesting media industry M&A information.

liability insurance industry had diverse effects. For example, while the acquiring firms achieved more revenue efficiency gains than non-acquiring firms, the target firms experienced greater cost and allocative efficiency growth than non-targets. They conclude that factors other than efficiency enhancement are important factors in property-liability insurer M&As. The literature surveyed in the above papers also provide noteworthy insights into the complexities of assessing the successes and failures of M&As.

In my view, there is a deeper conceptual problem with examining the M&A success/failure rates. The failure rate, whatever this number might be, is not the paramount indicator determining whether M&As are important, and a key component of firms' corporate strategies. M&As, therefore, are best thought of as *"complex gambles"* with significant uncertainty in outcomes. An analogy could be offered from the multiple R&D lines for pharmaceutical companies. Typically, less than 5% of the R&D lines yield successes for pharmaceutical companies, and an even smaller percentage lead to significant revenues and profits; for the major pharmaceutical companies, of the hundreds of drugs they may sell, the top 3-4 drugs typically account for over 50%-60% of the total revenues. Does this mean that multiple R&D lines are not important to them? Of course, not. Pharmaceutical companies need to have a large number of ongoing R&D lines in order to get the few key successes. Similarly, a firm may engage in multiple M&As, realistically expecting that only a small number may work out, due to complexities of integrating different organizations, potentially different technologies, workforce, initial information asymmetries between the acquiring and target firms, among others.[23]

Overall, the above discussion, while noting the complexities of assessing the precise successes and failures of M&As, makes clear that they are a critical part of firms' shorter-run and, more importantly, longer-run business strategy. Given this, my assumption is that any impediments, or penalties, imposed on the approval of M&As will likely be viewed as detrimental to their core longer-run business interests.

5.2 Proposal to enhance cartel enforcement

[23] For example, Schuler and Jackson (2001) note that firm's need to systematically address a variety of complex human resource issues in their post-M&A organizational and integration plans to make their M&As successful. They note that many of the M&A failures can be traced to difficulties in resolving HR issues. Salz (2006) notes a survey of senior executives of large US and European companies which reveals that cultural fit is critical for deal success. Respondents in the survey rated it more important than other commonly cited business priorities including strategic rationale, leadership and integration planning. The results of the survey of executives also cited *cultural differences* and *cultural resistance* as issues that surprised them the most during the post-merger integration.

The proposal: explicitly sanction competition law enforcement authorities to *directly* use information obtained during *non*-cartel (M&A and monopolization/dominance) investigations to prosecute cartels. If a *non*-cartel investigation (e.g., M&A) by the competition authority provides information on collusion with subsequent investigation and prosecution, then:

1. The M&A is blocked; and
2. The jurisdiction's fines and other penalties related to collusion are imposed.

As noted in section 5.1, since M&As can have appreciable longer-term strategic benefits for firms, blocking of the M&A imposes a penalty, which, in some circumstances, may be more damaging to the firm's business interests than the monetary and other cartel related penalties.

Following up on the discussion and analysis in sections 4.1 and 4.2, my contention is that the extent of discovery of "*seed"* information regarding cartel activities from *non*-cartel investigations would be greater if the legal and administrative barriers for information spillovers were lower, and the competition authorities were allowed to explicitly engage in *information mining* about cartel activities. *Non*-cartel investigations, such as M&As, often reveal rich data and information about the merging firms, potentially other firms in that market, and sometimes about related markets. Similarly, for monopolization/dominance investigations. If a firm is undergoing a M&A evaluation or is being investigated for monopolization, and if that firm is engaging in collusive activity, there is a reasonable likelihood that the competition authority's investigative procedures may be able to detect this behavior. Overall, by sanctioning information mining and allowing for *direct* use of information, *non*-cartel investigations and enforcement actions may end up revealing a variety of useful information about potential collusive activity.

Since obtaining the "*seed"* information about cartel activity is arguably the most important component in the fight against cartels, this would add a valuable tool in the competition law enforcement of cartels.

5.3 Potential benefits of the proposal

The proposal is likely to have a meaningful *deterrent* effect on firms' propensities to collude, as well as to continue with existing collusive agreements. As noted in section 5.1, M&As, for example, may be vital to many firms' core business strategies and longer-run success. If firms know that information gathered by competition authorities during M&A approvals, or other *non*-cartel investigations, can be *directly* used to prosecute for collusion and to block the M&As, they would be less likely to engage in collusion. While collusion may yield the firms shorter or medium term profits, the trade-off of jeopardizing their core business

strategies could be a harsh one.

The penalty arising from the proposal would be more severe on specific types of firms. If independent grocery stores or gas stations (petrol pumps) in a small town are price-fixing, the proposal noted above is not likely to have an effect on their incentives to collude as these types of business units are typically not in the M&A market. But larger domestic and multinational firms that produce differentiated goods and services and are diversified may be more affected by the proposal as they are often the ones that are very active in the M&A market. For example, as we look at some of the prominent cartel prosecutions of large multinationals in lysine, vitamins, pharmaceuticals, chemicals, semiconductors, airlines, and other industries, a lot of these firms are very active in the M&A market. The proposal, by explicitly sanctioning *information mining*, and *direct* use of information obtained during M&A reviews, and other *non*-cartel investigations, to prosecute potential cartels, may reveal the "*seed"* information about collusion, which is critical to prosecuting cartels.

This greater probability of detection, generated by the proposal, may act as an important deterrent. Finally, it seems fair to argue that prosecuting the larger, hardcore and international cartels is more desirable from a welfare gain standpoint. That the proposal puts these types of firms on the antitrust enforcement radar in a more visible manner, due to their greater activity in the M&A market, implies that potential increases in the efficiency and effectiveness of cartel enforcement, and welfare gains, can be large. These gains are probable irrespective of exactly how many cartels are actually prosecuted via this channel, and arise due to the likelihood of the proposal creating a meaningful deterrent effect.

5.4 Potential downsides of the proposal

Given the proposal, we have to consider the possibility of situations where the information processing by the competition authority leads to cartel investigations, when in fact there is no problem. That is, the likelihood of a *false positive*, or a Type 1 error. To be clear, it is not likely that there will be any actual cartel prosecutions as a result of these Type 1 errors. Actual prosecution of cartels, with imposition of fines and other penalties, require substantial evidence of actual collusion, to be proven in court. What we are concerned about is potential suspicion, investigation, harassment of firms, and potential damage to their reputations, when in fact there was no collusive activity at all. So we are not looking at *strict* Type 1 errors which would result in actual cartel prosecution, but more of a *weak* Type 1 error with no actual prosecution, but investigation related consequences. Type 1 errors, in their strict or weak form, are not uncommon in competition law enforcement actions. For example, Duso, Gugler and Yurtoglu

(2007, 2011) examine Type 1 and Type 2 errors in the context of EU merger enforcement.

Given the proposal laid out in section 5.2, there are at least two potential costs to consider:

1. Damage to a firm's reputation and harassment by the competition authority, and the likelihood that the proposal may generate a disincentive for some firms to file for M&As; and
2. Increased administrative and investigative costs by the competition authority that may arise from implementing the proposal.

Regarding the administrative and investigative costs that would be incurred by the competition authority, it needs to be kept in mind that such issues also arise in the context of merger (and monopolization/dominance) investigations, where many more mergers are reviewed compared to actual court cases. For example, between 2005-2009, the US Department of Justice received on average about 1,606 Hart-Scott-Rodino merger filings per year, but only about 7 antitrust merger cases were filed in court per year; only a tiny fraction, 0.4%, of the HSRs received translated to actual court cases. Regarding European Commission enforcement, the data in Duso, Gugler and (2010) show that the proportion of merger cases that went to Phase II was 5.5% before the introduction of the new merger regulation, and 2.6% after. The bottom line is that the number of mergers that are blocked or seriously challenged are a disproportionately small fraction compared to the total number of mergers reviewed, and administrative and investigative reviews conducted.

The onus, therefore, is on the efficient organizational structure of the competition authority, as well as the administrative, legal and political checks and balances that are typically imposed on competition agencies, to weed out bogus investigations, and focus only on those that matter. Regarding the issue of disincentives, assuming that the competition authority minimizes bogus investigations, such disincentives, and damage to a firm's reputation, are minimized. Equally important, if a firm is not engaging in collusive activity then there is nothing to fear as there is no penalty of the sort laid out in section 5.2.

While both the costs noted above are legitimate and important considerations, they can be minimized in a steady-state competition law enforcement regime with appropriate checks and balances framed within the administrative, legal and political processes.

6. Concluding remarks

Cartels can cause significant damage to markets in numerous dimensions. A reduction in collusive activity, therefore, not only benefits the consumers and the economy in terms of lower prices of goods and services, but also potentially

produces beneficial effects related to product variety and quality, and innovation. In antitrust/competition law enforcement, most of the focus, and the visible impacts, are related to prices. In part this is due to the relatively easier quantification of prices. The effects related to product variety and quality, and innovation, are more difficult to quantify. The key point to note is that the price-based damages effects are a lower-bound on the true economic damage caused by cartels.

Given this, it is crucial to implement mechanisms that provide disincentives to form cartels as well as continuation of existing conspiracies. The corporate amnesty/leniency programs that were implemented by the US Department of Justice in 1978, revised in 1993, and bolstered by the Antitrust Criminal Penalty Enhancement and Reform Act (ACPERA) of 2004 (and revised and extended to 2020), do exactly this.[24] Similarly for the programs that were instituted in the EU and many other jurisdictions later; by recent count, close to 100 competition jurisdictions have some form of corporate amnesty/leniency program. The amnesty programs, by encouraging defectors, destabilize existing cartels and likely reduce incentives to form of cartels. The high monetary fines, and incarceration in some jurisdictions, add to the "stick" component of the competition enforcement actions against cartels.[25]

The proposal I lay out in this paper – which would sanction the direct use of data and information from *non*-cartel investigations to investigate and prosecute cartels – is likely to add to the disincentives to form cartels and continuation of existing conspiracies. My argument was based on examining the management, corporate strategy and economics literatures, where M&As, for example, form an integral part of firms' core business strategy, with potentially important longer-run gains to their business operations and market positions. While collusion may provide the shorter-run gains in profits that firms seek, but the trade-off of being discovered via a *non*-cartel (e.g., M&A) competition authority investigation with the resulting penalties (see section 5.2) may be quite harsh. I discussed the potential benefits and downsides of the proposal, and the specific types of firms that are more likely to be affected by this proposal, which

[24] A recent paper by Sokol (2011), however, paints a far more complex picture of the leniency programs. Sokol notes that there is likelihood of strategic gaming of leniency if a competition authority has a generous leniency program. In his questionnaire survey study, Sokol finds that the majority of practitioners stated that the leniency program may be, strategically, used to punish rivals as well, as aid in enforcing collusion. This provides evidence supporting Miller (2009). As Sokol notes, the important issues therefore are the frequency and severity of the strategic gaming. Bottom line is that if these are high, then the overall effectiveness of the leniency program is far more complex and ambiguous, and does not lend easily to the stated claims of huge success by the competition authorities.

[25] For discussion of a related mechanism of instituting an individual whistleblower provision for cartel detection, see the discussion in Ghosal (2008b).

are likely to be the larger domestic and multinational firms. Since most firms engaged in hardcore domestic and international cartels fit this profile, the proposal brings on the radar exactly those firms that need to be carefully scrutinized.

While in sections 2 and 4.1 I discussed illustrative examples of cartel cases emanating from *non*-cartel investigations, I return to the example related to South Africa's Competition Commission. Two collusion cases were detected *via merger reviews*.[26] The first case relates to merger review in the market for plastic pipes, used mainly by municipalities in the provision of water and sanitation. South Africa's Competition Commission brought the case against the two pipe manufacturers and five others in January 2009, accusing the companies of bid-rigging, price-fixing, and market and customer allocation. Eventually, South Africa's Competition Tribunal levied a 5 million rand settlement between Flo-Tek Pipes and Irrigation Ltd. and the South African Competition Commission, and approved a 7 million rand settlement with Swan Plastics. Both companies admitted to violating South Africa's Competition Act and agreed to pay penalties representing 6% of their turnover for 2007. For the scrap metal case, the Commission initiated an investigation into possible collusion in this industry following its prohibition of a horizontal merger in the industry in February 2006. The merger documentation implicated the parties in anti-competitive behavior in the collection and supply of ferrous and non-ferrous scrap metal. South Africa's Commission found evidence of collusive tendering in the 2007 auction of wagons, coaches, and tankers by state owned rail transport entity, Spoornet (Transnet Freight Rail). In both these cases, it took South Africa's Competition Commission much time to initiate new cartel investigations against the firms and gather new evidence, causing delays and administrative and legal uncertainties.

The main question: if the rules explicitly sanctioned the (South African) Competition Authority to information mine *non*-cartel investigations, and ***directly*** use those data and information to prosecute cartels, would the firms have lesser incentive to collude? My answer, based on the discussion of the strategic importance of M&As to firms (see section 5.1), is likely to be yes. Assuming a well functioning and active competition law enforcement authority, the main conditioning statement relates to the specific types of firms the proposal would affect more: those that are larger, differentiated and diversified firms operating in domestic and international markets as they are far more active in the M&A

[26] For the plastic pipes case, see: The Competition Commission vs. DPI Plastics, Petzetakis Africa, Marley Pipes System, Swan Plastics, Amitech South Africa, Flo-Tek Pipes & Irrigation, Macneil Agencies, Andrag and Gazelle Plastics (Case number 2008Mar3596). For the scrap metal case, see: The Competition Commission vs. The New Reclamation Group (Reclam), Aberddac Group, Amalgamated Metals Recycling, Ben Jacobs Metals, Power Metals, SA Metal and Universal Recycling (2007Aug3121).

market. Smaller, local, firms, that are not (less) active in the M&A market are not likely to be caught by this rule change.[27]

Overall, the *deterrence* effect of my proposal, particularly on larger, multiproduct, and multinational firms, is likely to be meaningful. Given that collusion by these types of firms can result in significant economic damage, this additional deterrence, and the likely lower incidence of collusion, may enhance the efficiency and effectiveness of the fight against cartels and provide meaningful additional gains in welfare.

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[27] In my discussion of the proposal, there is no consideration of strategic information transmission, implying that the incentives to reveal or hide information are not addressed. For example, if the firms involved in M&A reviews knew that all information unearthed could also be used in later cartel prosecution (and vice versa), they may act differently. This calls for a richer theoretical framework to better understand information flows between firms and the competition authority as well as across non-cartel and cartel cases.

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