LATIN AMERICAN AND CARIBBEAN COMPETITION FORUM

Session I: Cartels: Estimation of Harm in Public Enforcement Actions

-- Background paper by the OECD Secretariat --

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LATIN AMERICAN AND CARIBBEAN
COMPETITION FORUM

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Session I: Cartels: Estimation of Harm in Public Enforcement Actions

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BACKGROUND PAPER BY THE SECRETARIAT*

Abstract

The appropriate approach for competition authorities with regard to estimating harms from cartels depends on their individual legal situation. But as fines have grown larger, the debate has increased about the role of harm in determining an exact fine amount. Different jurisdictions hold diverging views on the relationship between considering harm to consumers or illicit gains and determination of the appropriate level of fines. Many jurisdictions do not consider harm at all when setting fines. To the extent harm is considered, the role that the quantum of actual damage plays in the calculation of cartel fines largely depends on the extent to which fines are geared at deterring future cartel behaviour, apart from punishing offenders and achieving restitution. If restitution were the only objectives of fines, the amount of harm or illegal profit would be the main factor to consider for the purposes of calculating fines. However, if deterrence is a primary objective, the correlation between the actual harm caused and the level of fines becomes weaker. As a result, to promote deterrence, firms may be subject to large fines even when a particular conduct has little effect on the economy. This does not mean that the actual harm caused by a cartel should not be at all considered for the purposes of setting fines. Some jurisdictions provide for sanctions for cartel behaviour while assuring there are effects of the infringement when calculating certain fines.

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1. Introduction

1. In recent years, companies prosecuted for cartel participation have paid large fines, sometimes amounting to hundreds of million USD, and have also made substantial damage payments, mostly to private plaintiffs. Large fines are not just limited to the U.S. and EU, as may have been the case between 2000 and 2009. Fine amounts in Latin America, for example, have reached as much as USD 1.4 b for an alleged cartel involving six cement companies in Brazil, as assessed in 2014. Fines and damages jointly play a crucial role in deterring cartels by ensuring that the financial cost for a company of participating in a cartel may either exceed expected gains or at least partially counterbalance the expectation of supplementary earnings from an unpunished cartel. When the amount of fines is based on the percentage of affected turnover or commerce, as is commonly the case, the fine amounts are often implicitly based around principles of deterrence, disgorgement or obviating harm.

2. Some competition authorities examine harm from cartels or benefit to the cartelist, as a criterion for setting the fines in these cases. This occurs, for example, under Chilean law and courts in France, Germany and Spain have insisted on assurance of existence of harm when considering fines. Such an approach, particularly when harm is measured quantitatively, builds on the economic effect of the conduct and not on a pre-defined formula based on turnover. Even when the violation itself is a per se violation, the extent of harm may be worth considering, at least internally, for the purpose of prioritising cases and for the exercise of prosecutorial discretion. This note argues that competition authorities can usefully consider harm from a cartel, even if they are not recovering damages, when fine amounts are determined by predefined formulae based on percentage of turnover. It may be worth considering, as discussed in Lianos et al (2014), whether fines should be more related to a formula based on affected turnover or whether they should at least take account of whether real harm exists and be built up in a way that factors in either harm to consumers or illicit profits derived by cartel participants.

3. This note suggests that:

- In many economies, corporate fine amounts for cartels have reached levels in which they make a substantial dent in profits for corporations, thus helping to promote deterrence, but also raising the possibility that in some limited cases, fines may be very much larger than the harm engendered by the cartel.

- The percentage of consumer harm and illicit gain from cartels varies substantially across cartels.

- Standardised rules for setting fine amounts based on percentage of turnover or commerce may merit mitigating factors based on low actual or potential harm in individual cases.

- Where required by law or courts, competition authorities may consider increasing efforts not only to assure themselves that harm is potentially substantial when fines are substantial, but also to assure courts that such a determination is based on real considerations.

- The hardest part of calculations about the size of harm from a cartel (or cartelist benefit) is estimating the price that would have existed absent the cartel (the “but-for” price).

4. This note regularly discusses both consumer harm and illicit gains to cartelists. These are not generally equivalent but are two commonly discussed standards for evaluating effects of cartels. Consumer surplus based considerations of enforcement may lead to a focus on consumer harm, whether this is at the intermediate or ultimate consumer level. In contrast, a focus on deterrence will lead to a focus on illicit gains to firms participating in the cartel, because when they decide to join a cartel, and potentially calculate the expected gains of participating in a cartel against the expected risks (notably fines and damages), the
appropriate expected gains to consider for the probabilistic calculation are generally the illicit profits from the cartel. Courts and law may open the door more broadly to considerations of harm to the economy. These could include consideration of impacts on quality, choice, innovation, jobs, economic growth, trade flows and FDI. For example, a cartel in the domestic transport sector may have follow-on effects on trade in sectors that use transport services in a way that aggravate its overall economic impact. While such broad considerations are not discussed in this paper, their consideration may be enabled by some laws and this note is not intended to suggest otherwise.

5. This note will proceed as follows. Section 2 will consider the relationship between fines for cartels and generalised harm or corporate benefit, showing that the deterrent effect of fines is based on their relationship to corporate benefit. Section 3 will consider how knowing the amount of harm or corporate benefit can help to ensure appropriate fines. Section 4 will identify different methods for calculating harm and corporate benefits related to individual cartel cases.

2. On the relationship between fines for cartel participants and the harm they cause or benefits they receive

6. Many law violations have fines that are fixed in the law. Cartel fines are no exception, though generally the figure that is fixed, if any, is a maximum. In the Dominican Republic, the maximum is fixed with respect to a multiple of wage levels. In the EU, the maximum fine is 10% of global turnover.

2.1 The way that fines are determined may be affected by their objective

7. As stated in OECD (2013), the main objectives of imposing fines are often deterrence, punishment, or disgorgement. Some jurisdictions may place more emphasis on one objective than another, or exclude one objective entirely. Considering each of these in turn:

- Deterrence eliminates the incentive to engage in illegal and anticompetitive conduct;
- Punishment is a penalty on undertakings or individual for breaching the competition law; and
- Disgorgement requires the undertakings or individual that violated the law to give up any financial benefit from its illegal activity.

8. The objectives of punishment and disgorgement are closely related to the objective of deterrence. By showing that the competition authority will punish undertaking or individuals for proven breaches of the competition law, the incentive for engaging in that conduct is deterred. By taking away any profits coming from their illegal conduct, the incentive for engaging in that conduct is also eliminated and thus the conduct is deterred, provided that other deterrent measures are also applied.

9. The way criteria for calculating fines may differ depends on the objective(s) that the fines pursue. For example, Japan’s competition authority determines the fine depending on the size of enterprise (large-sized, small and medium sized) and the type of business (manufactures or retailers), taking into account average sales amount and ordinary profit. The character of the fining system for cartels in Japan is largely aimed at disgorgement. That is, the government collects an economic gain derived from a cartel so that cartelists cannot keep it, not as a monetary punishment against cartels. In Canada, the Competition Act clearly states that the purpose of administrative monetary penalties is to “promote practices” that are “in conformity” with the law; the Competition Act explicitly excludes punishment as a purpose of such penalties. In contrast, Germany can impose punitive fines with added compensation for excess gains [ARC section 81(5)] because according to Section 17(4) of the Act on administrative offences, administrative fines shall exceed gains made as a result of the infringement. Therefore, the character of the fining system in Germany includes both punishment and disgorgement. According to the U.S. submission
to the Sanctions roundtable of the 2016 Global Forum on Competition, a “court’s imposition of a sentence under U.S. law is governed by 18 U.S.C. § 3553, which requires it to ‘impose a sentence sufficient, but not greater than necessary, to comply’ with specified purposes. These purposes include the need to ‘reflect the seriousness of the offense . . . and to provide just punishment for the offense’ as well as the need to ‘afford adequate deterrence.’” In the U.S., the statutory maximum fine for a criminal cartel violation is fixed at a maximum of USD 100m. But maximums may at times be unduly constraining, as a relatively commonly accepted principle is that fines applied should in some sense be related to the gravity of an offense. Perhaps in consequence of the need for adequate deterrence, the U.S. alternative sentencing guidelines envision alternative methods of fine calculation that can exceed USD 100m, notably based on a maximum of twice the gross gain from the offense or twice the gross loss to victims from the offense. As a result of this exception, and based on alternative sentencing, fines exceeding USD 100m have been imposed in the US.

2.2 Fines are substantial

10. The question of how to determine fines, and the extent to which they should be conditioned on evidence of harm, is fundamental when fine levels are large. While there is debate about whether fine levels are sufficiently high to provide a full financial deterrent to cartel participation, there is little debate that fine levels have increased substantially in the last decades and now amount to hefty levels that attract the attention of corporate boardrooms, a valuable condition for deterrence. Recent calculations suggest that between 2004 and 2015, worldwide fines amount to about USD 92 b. Cartel fines in Latin America, from the Private International Cartels database by John M. Connor (July, 2016), are USD 4.3 b over this period. Fines have grown substantially since the pre-2000 period. The increase in fines may result from a tendency to increasingly focus on the deterrent aim of sanctions. Whether fines overall are sufficient to deter cartel conduct is a real question for debate, given that many cartels likely go undiscovered and deterrence requires fines that are multiples of actual gain, to account for the expectation that many cartels are never prosecuted.

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Source: Private International Cartels spreadsheet by John M. Connor (July 2016). * Other regions include cartel fines imposed by multiple jurisdictions that we were not able to allocate precisely to each jurisdiction.

11. The existence of large fines means that ensuring they are appropriate is a matter of broad public policy and judicial interest.

2.3 Fines are customised for each cartel and firm

12. The appropriate approach for competition authorities with regard to estimating harm from cartels depends on their individual legal situation. But as fines have grown larger since before 2000, based largely on guidelines, the debate has increased about the value of evaluating harm prior to determining an exact fine amount. The extent to which automatic calculation of fines based on guidelines is appropriate has different perspectives. On one hand, automatic calculations provide the clearest indications to potential cartelists of the expected fine level and may serve a valuable deterrent purpose. On the other, automatic calculations may be felt by some, including some courts, not to sufficiently consider individual
circumstances. This is one reason for the extensive account given to a number of mitigating and aggravating circumstances in many guidelines.

13. Different jurisdictions hold diverging views on the relationship between quantifying harm to competition and quantifying the appropriate level of fines. See Box 1 for one example of evolving standards. Many jurisdictions do not consider harm explicitly when setting fines. To the extent harm is considered in some jurisdictions, the role that the quantum of actual damage plays in the calculation of cartel fines largely depends on the extent to which fines are geared at deterring future cartel behaviour, apart from punishing offenders and achieving restitution. If punishment and restitution were the only objectives of fines, the amount of harm or illegal profit would be the main factor to consider for the purposes of calculating fines. Punishment and restitution are rarely the exclusive objectives, though. If deterrence is a primary objective, the correlation between the actual harm caused and the level of fines becomes weaker. As a result, to promote deterrence, firms may be subject to large fines even when a particular conduct has little effect on the economy.

Box 1. The value of harm quantification for the calculation of fines: Developments in France

As noted above, the issue of whether the quantum of cartel harm should play a role in fine setting is not one on which most jurisdictions agree. Neither is it a topic on which jurisdictions’ positions and case-law are fixed but one that evolves, particularly in light of fact patterns in given cases.

The example of France illustrates how these ideas can be the object of an evolutionary process. Today, the French Competition Authority’s Notice on the Method Relating to the Setting of Financial Penalties emphasises that cartel harm cannot be presumed. The road to this assertion began in 2005.

That year, the French Competition Authority (FCA) imposed pecuniary sanctions on mobile telephony operators Bouygues Télécom, SFR and Orange France for allegedly exchanging confidential information and sharing the mobile telephony market. For the former offence, the Authority imposed fines between EUR 16 million and EUR 41 million; for the latter offence, fines ranging between EUR 42 million and EUR 215 million were imposed by the competition authority. Following an unsuccessful appeal to the Paris Cour d’Appel, the case finally reached the Cour de Cassation in the last instance. Among other grounds of appeal, one of the appellants argued that the Cour d’Appel had erred in approving the summary and abstract calculation of harm to the economy carried out by the FCA, which had been based mostly on the market’s size and on the fact that all the operators had participated in the practice. The Cour d’Appel had not deemed it necessary to precisely determine the damage to the economy, noting that it could be presumed in the presence of an anti-competitive agreement.

The Cour de Cassation challenged this presumption and denied that damage to the economy can be presumed from the existence of an anti-competitive practice. Firstly, the Cour de Cassation noted how the Cour d’Appel had stated that “it would not be excluded” that the information exchange could be anti-competitive, without providing reasons on how this conclusion had been reached. The Cour de Cassation then noted that, following the relevant provision of the Code de Commerce, sanctions imposed for a practice having the object or potential effect to impede, restrain or distort competition must be proportionate to the damage caused to the economy by this practice. The Cour de Cassation added that this damage could not be presumed. Finally, the calculation methods used by the FCA for determining the harm to the economy were also called into question. The Cour de Cassation found that this calculation should also have considered demand elasticity, apart from market size and proportion of market participants involved in the practice. However, the ruling did not declare an obligation for the FCA to carry out a precise determination of damage. The Cour de Cassation therefore remitted the case to the Cour d’Appel for reconsideration.

The FCA followed up on this ruling. In a 2010 decision, the FCA quoted the Cour de Cassation’s ruling prior to analysing the effects of an artificial price increase, that same year, in the context of a case concerning multilateral exchange fees for processing checks, the FCA issued a decision examining the impact of the infringements on each category of remitting customers, including a quantitative calculation of price increases. It provided an estimate, considering that for each extra cent of overcharge, the price paid by customers had increased by EUR 220 million over the entire period of time.
That same year, the Minister for the Economy, Industry and Employment initiated a study calling for a panel of experts to consider the assessment of competition fines, and also involving different competition regulation stakeholders. The FCA subsequently issued its Notice of 16 May 2011 on the Method Relating to the Setting of Financial Penalties, which echoed the Cour de Cassation’s judgment by expressly stating that “[t]he harm done to the economy cannot be presumed”.

14. However, this does not mean that the actual harm caused by a cartel cannot be a relevant consideration for the purposes of setting fines.

- Some jurisdictions provide for sanctions for cartel behaviour while accounting in some way for the effects of the infringement when calculating the fine, for example by considering the extent of cartel implementation or the extent of harm/cartelist benefit as either aggravating or mitigating circumstances. Chile, for example, has considered cartelist benefits in the past, and court cases have suggested that a precise quantum is not needed, as long as it is reasonable to believe that such benefits existed. French, German and Spanish competition authorities have been required by courts to consider impacts of cartels when setting fines in selected cases.

- Other jurisdictions limit the aggregate corporate fine by an alternative method that is not based on turnover. In the Dominican Republic, for example, cartel fine maximums are between 30 times and 3000 times the minimum wage. Such an approach nonetheless can present the risk that maximum fines may substantially understate actual illegitimate gains.

2.4 Customising fines based on affected firm gains can support effective deterrence

15. Ultimately, the driving factor for ensuring adequate deterrence through public fines and damages for corporate malfeasance is based on the principle that the expected financial sanctions should exceed the expected gain. Given that corporate gain and consumer harm are likely relatively closely related in many cartel cases, the underlying principle of deterrence through fines and damages is that the sum of the two should be large enough that their expected value is greater than that for the expected corporate gains. Given that the detection rate of cartels is less than 100%, the fines and damages would need to exceed the gain by some factor in order to achieve full deterrence. For example, if 50% of cartels go undiscovered, then the financial fines and damages would need to exceed illicit corporate gains by a factor of 2. If 90% of cartels go undiscovered, the appropriate factor would be 10, which could raise a question of whether such a large financial penalty would be “just”, even if necessary to deter. Ensuring penalties are just is one reason that maximum fines as a percentage of turnover are common. But maximum penalties may not always provide effective deterrence, particularly if cartel prosecution rates are low.

16. While such an observation may initially seem to suggest a backpedalling from the principle that effective deterrence is a necessary aspect of law for such serious behaviour as cartel participation, this is not the implication. It is worth noting that sanctions, including criminal sanctions, individual fines, director disqualification or bid exclusion, can have an important role to play in cartel deterrence as well, at least in those jurisdictions where such measures are available and applied. While limited generally to actual damages suffered, the existence of private damages adds to the impact of fines for the purpose of deterrence and from the perspective of companies carrying out their calculation of expected gain and loss from participating in a cartel, fines and damages are essentially interchangeable. Potentially, to the extent that private damages are not present, fine levels may need to be higher than in jurisdictions in which private damages actions are well developed, as there is likely some trade-off, in practice, in the impacts of
public and private cartel actions, even if the objectives of the government and private sector are different. If private damage cases increase the amount that companies pay when a cartel is prosecuted, equivalent deterrence to the environment without private damages can potentially be provided with lower fines. In some countries, such as the U.S., the damages can often exceed fines due to the law on treble damages in cartel cases.

2.5 In order to deter cartel formation, fines may be based on multipliers of harm or corporate benefits, taking into consideration the likelihood that many cartels are not prosecuted. Percent of commerce fine levels can achieve this in many cases.

17. The use of a percentage of affected commerce to determine the base fine is intended to make sure that the fine is proportional in some sense either to consumer harm or to corporate gains from illegal activity. Obviously, if fines are derisory in comparison to the potential gain from illegal activity, there will be little financial incentive to avoid the illegal activity. In contrast, if gains and harm are derisory with respect to the fine level, the fine may be regarded as, in some sense, excessive and potentially an abuse of prosecutorial power. Thus a careful balancing is required when determining the appropriate approach to determining fines, and a possible approach is to consider at least average levels of consumer harm or corporate benefit.

**Box 2. The close relationship between illegal gains and cartel fines in Chile**

Illegal gains play an important role for the determination of cartel fines in Chile, although other factors and modifying circumstances must also be accounted for in this context. The quantum of these gains, however, need not be exactly determined if evidence is unavailable, and a ballpark estimate can suffice.

In a major case involving collusive behaviour in the poultry market, one of the parties claimed its participation in the conduct had not significantly harmed the market. The Chilean Competition Authority (FNE) brought forward a report containing a quantitative analysis of the harm caused to the market by the collusive agreements (which was not used by the Chilean Competition Defence Tribunal, TDLC, due to alleged methodological flaws). On appeal to the Supreme Court, one of the parties claimed that the TDLC did not have sufficient evidence with regard to the actual or potential effects of the conduct, which made it incapable of determining the behaviour’s gravity and the corresponding fine. Moreover, it was argued that the TDLC had no basis to determine a surcharge of at least 3% while failing to consider evidence demonstrating the conducts’ lack of price effects. The Supreme Court noted that the calculation of fines was not equivalent to a mechanical calculation of illegal profits, but that a number of factors (such as whether the infringement affects key sectors of the economy) have to be weighed in for fine setting. No specific quantification of the illegal gains had to be reached, as long as it was reasonable to estimate that these benefits existed.

Similar determinations were reached by the Supreme Court in other recent cases. For instance, the assertion that fine determination does not consist of a mere mechanical calculation of illegal gains, but that other factors, as listed by the Competition Act, also play a role in fine determination was included in judgments concerning cartel cases in the markets for gynaecological healthcare services and transports.

In the former case, the FNE had asked the Supreme Court to increase the amount of the fine, among other reasons because of the loss of social welfare derived from collusive agreements in the healthcare market. The Supreme Court noted that the sanctions had been correctly fixed by the TDLC on the basis of the illegal profits obtained. In the latter case, the Supreme Court noted that, although the illegal profits could not be precisely determined, this did not prevent a finding that such gains existed, and therefore the fine calculated by the TDLC had not been unreasonable – the Supreme Court actually increased the fines imposed, on the basis of a number of other factors. A similar conclusion was reached by the Supreme Court in its judgment on a collusion case involving bus transportation, where the Court noted that, although the illegal gains could not be precisely quantified, a reasonable estimate could serve as a basis for fine calculation. Factors other than illegal gains were also considered for calculating the fine; for instance, the gravity of the infraction was increased by the fact that it affected a “highly sensitive sector for the population”, namely transportation between the rural cities of Caldera and Copiapó.
18. Cartelist fines as a percentage of commerce originated in the United States. In support of the idea that fines may be based on consumer harm or corporate benefits, it is of interest to review the historical origin of. The underlying rationale for calculating fines as a ratio of affected commerce in the U.S. Alternative Sentencing Guidelines is to make fines related, in some sense, to generally expected harm or benefit levels. According to the U.S. submission to the Sanctions roundtable of 2016, “the United States Sentencing Commission believed that fines for economic crimes should be closely related to the resulting gain to the perpetrators or the resulting loss to the victims. But the Commission also appreciated that determining gain or loss could be difficult. For cartel offenses, the Guidelines employed a readily determined proxy for gain and loss, explaining that: ‘The purpose for specifying a percent of the volume of commerce is to avoid the time and expense that would be required for the court to determine the actual gain or loss.’ It is interesting to see, then, that the principle of basing fines on cartel harm or benefit underlies the first major cartel fining system; other systems may, to a greater or lesser degree, have drawn ideas from this first major fining system.

19. In the European Union, after the basic amount is increased to reflect aggravating factors or decreased to reflect mitigating factors, the European Commission may increase specifically the adjusted amount of fines once more for deterrence or disgorgement. The EU Fining Guidelines read: “The Commission will also take into account the need to increase the fine in order to exceed the amount of gains improperly made as a result of the infringement where it is possible to estimate that amount” (paragraph 31). The impact of the rule is to permit higher fines when merited by the facts. Thus some major jurisdictions do have a rule in their fining guidelines that, if possible, the real impact of the infringement (illegal gains or affected harm) can be considered when setting fines.

2.6 Making sure the fine is proportional to consumer harm (or illegitimate corporate gain) is not necessarily achieved in every case via fines as a standard percentage of affected turnover, but may be achieved on average.

20. The point of using an average approach (such as fines amounting to 20% of affected commerce over the period of a cartel) to set fines is to use a proxy for figures that may otherwise be difficult to calculate and for courts or other decision makers to assess. The 20% figure would not generally be intended as punishment, but rather one of deterrence or of disgorgement because average illegal price increases may amount to comparable percentages. In order to ensure that fines are then appropriate in a given case to a given firm is then a function of mitigating and aggravating circumstances, as described in OECD (2013) and OECD (2016). As found in these studies, the use of harm (or cartelist benefit) as a potentially mitigating (if low) or aggravating (if high) circumstance is not particularly common in formal rules. This does not mean that in practice, such considerations do not influence the ultimate determination of fine levels.

21. While ensuring that fines are related to average benefits to corporate cartelist or the harms they induce may be pragmatic, such an approach ignores the substantial variation that exists in impacts of cartels. According to a review of overcharge estimates by cartels reported in Oxera and Komninos (2009) and shown in Figure 1, there is a distribution of overcharges that runs from 0 (in about 7% of cases) to 70% (or more), with a median range between 10 and 20%. This means that the prices in cartels, based on those cartels reviewed, lie in the median between 10 to 20% in excess of the level that would exist outside of the cartel.
Figure 1. Historical overcharge estimations

Source: Connor and Lande (2008) as reported in Oxera and Komninos (2009). Note that the Oxera and Komninos study was an independent study prepared for the European Commission on moving towards guidance for quantifying damages, and it performed a detailed review of the path-breaking Connor and Lande meta-study on cartel damages.

Box 3. Fines for agreements that were not implemented or even not concluded

The possibility of actual harm being able to play in the calculation of fines becomes particularly interesting in cases like Zucarmex, which involved collusion in the Mexican sugar market. In this case, the collusive behaviour at stake involved agreements that may not have been strictly complied with throughout the duration of the infringement. The Mexican Competition Authority, COFECE, estimated the price increase brought about by these collusive agreements in quantitative terms, explicitly taking this uncertain compliance into account. This estimated quantum was used as a basis for the sanctions.

The Costa Rican Comisión para Promover la Competencia (CPC) also dealt with a case in which it was not possible to prove whether a cartel agreement was eventually implemented. In this context, the CPC did not take account of the lack of implementation for the purposes of determining the existence of an infringement, but it did account for this fact as an attenuating circumstance for the purpose of imposing the fine.

In Australia, the Australian Federal Court has very recently issued a judgment on the ANZ case, which involved collusion and rigging of financial benchmarks. The Federal Court had to deal with agreements that were contemplated but not ultimately concluded, and which therefore failed to influence financial benchmarks, as argued by the defendants. In this context, the judgment notes that “while the potential adverse effect of the attempted contraventions cannot be quantified or even estimated, it cannot be simply dismissed as minor or trivial”, noting that “they remain, however, very serious attempted contraventions”. The Federal Court also noted that any penalty must be “proportionate to the contravention”.


22. Figure 1’s depiction of the wide variation in price increase levels illustrates why competition authorities could usefully consider the impact of individual cartels when setting fines, not just the average impact. Given that variation in price overcharges is substantial, so is the variation in harm and illicit gains to cartelists. An approach that formulaically assigns a base fine based on a fixed percentage of affected commerce, and then does not apply low impact as a mitigating factor misses this variation and can result in fines exceeding harm or expected illicit gain. At the same time, for cartels with price impacts that substantially exceed the average, the base fine may not even exceed the expected illicit gain unless aggravating circumstances allow for consideration of the size of the harm or illicit gain, although deterring fines may then reach levels that would effectively be unpayable.

3. Knowing quantum of consumer damages (or illicit gain) can be one useful factor, among many others, for determining whether fines are at levels appropriately related to the impact of the behaviour under review.

23. If using a fixed percentage of affected turnover as a base fine may at times result in fines that are substantially in excess of consumer damage or illicit gain, how can competition authorities and decision makers respond? One possible approach is to ensure mitigating and aggravating circumstances can consider the extent of harm or illicit gain from a cartel. Another approach is to consider evidence related to harm or illicit gain, without necessarily calculating a quantum. In this regard, case law has sometimes, though rarely, insisted on serious consideration of effect, as described in Box 1 and Box 4. This does not mean that, in these cases when courts insist on greater focus on effect, fines must be strictly proportionate, in a mathematical sense, to damages or illicit gains. A base fine of a fixed percentage of turnover may serve as a general rule, but may need substantial variation in specific cases. Competition laws and courts rarely insist on precise quantification, but are at times interested in an assurance that serious consideration has been given to actual (or expected) harm or illicit gains when calculating levels of fines.

Box 4. Decision reviewers calling for harm estimates

Regardless of how cartel harm is to be estimated (for example by using price effects, illegal gains or duration as proxies), there have been cases where decision makers on appeal have highlighted failure of the lower instance to determine or at least estimate cartel harm. To several of the cases already cited in this document, the examples of Spain, Canada, the EU and Australia can be added.

In 2012, the Spanish Competition Authority (then CNC, currently named CNMC) had fined three cement companies for cartel behaviour consisting in price fixing and market sharing. On appeal, the Spanish Supreme Court annulled the sanction and remitted the case to the CNMC for quantification of the fine under Articles 63 and 64 of the Spanish Competition Act.

The Supreme Court noted that, for the purposes of the calculation of fines, the extent and duration of the infringement and the infringement’s effect on the rights of consumers and users should be taken into account, among other factors.

The Court noted that, in this regard, it was not enough for the CNMC to define the size and characteristics of the relevant market; the Authority should have also calculated the market share affected by the infringement and the extent of each firm’s participation in the market sharing infringement; should the Authority lack the necessary data to carry out this determination, it ought to venture an estimate. Moreover, according to the Court, the Authority should have taken into account the brief duration of the infringement, which is a proxy for the effect of the collusive practices on consumers and users.

The Supreme Court emphasised that fines must be proportionate to the specific distortion of competition caused in each case. If the Authority chooses not to consider attenuating or aggravating circumstances, it is not allowed to impose the maximum level of fines.
3.1 While in some cases estimating a quantum of harm may be very difficult, when such calculations are feasible, ignoring the quantum of damages can create situations in which firms that caused little or no harm are fined an amount considerably in excess of a reasonable estimate of that needed for deterrence

24. To the extent that, according to one set of data, about 7% of cartels appear to have no demonstrable price effect, as suggested by Figure 1, 33 corporate financial gains from such activity are likely zero. In such cases, fines calculated around a base fine will necessarily be substantially in excess of any reasonable estimate of actual gain, though not necessarily of expected illicit gain. If another 15% of cartels have price impacts between 0 to 10%, as suggested by Figure 1, the corporate gains are again limited. Large standardised fines would also be in excess of illicit gains in such cases. Were cartel effects on price uniform, the value of considering quantum of damages in individual cases might be limited. But many factors can lead to a variation in price impacts and gains, so estimating the quantum, an approximation of it or a likely range in which it lies can be a relevant factor to consider in determining appropriate fine levels in particular cases. Disproportionate fines in instances of low impact could raise a question of fairness and justice that is not present for the high-impact cartels, when fines and other penalties may be too low to deter. Moreover, disproportionate fines could create a potential “cost” of over-deterrence, such as a chilling effect on co-operation with competition authorities and potentially reduced incentives to apply for leniency, particularly to receive partial leniency as a subsequent applicant.
3.2 Cartels will yield lower or higher benefits to firms depending on economic conditions

25. Ensuring that quantum of damage is considered may allow to account for real and understandable variations in cartel impact due to demand and supply conditions. For example, in products for which cartel gain would be very low (for example due to low margin gains from cartelisation) compared to many products, using the standard percentage of commerce figure may result in an excessive fine level compared to the expected gain. Elasticity of demand can be a key variable affecting the extent to which cartels are able to raise prices (in this respect, see the Cour de Cassation judgment described in Box 1). For example, the presence of close substitutes that are not cartelised can ensure a high elasticity of demand with respect to price at a certain level of price, and thus prevent large price increases by a cartel. In contrast, with unusually low elasticity of demand, the ability of cartels to raise prices may be substantially higher.

3.3 Cartel behaviour encompasses some behaviour that may not yield higher prices/lower quantity in some cases

26. If competition authorities consider the quantum of damage, this may allow them to account for the fact that some types of cartels (e.g., information exchange) may potentially yield no or little commercial gain in some cases, absent both an agreement to limit quantity and a punishment mechanism for cartelists that violate the agreement. The absence of overcharges in some cartels may arise for example from non-implementation of an agreement, from envisioned agreements that ultimately failed to be concluded (as illustrated in Box 3) or from exchanges of information that, while deemed illegal and improper, do not yield price impacts (but may still merit a financial penalty).

27. In cases without overcharges, it is worth considering local case law on the extent to which object or effect is determinative for fine setting. For example, if 2 hotels that are the sole present in a market exchanged average price and occupancy information looking ahead in time, the impact of that may be to raise prices in periods of demonstrably high demand and lower them in periods of lower demand. The information may also be of great interest to managers, who are interested to benchmark themselves against their competitors. The information could also serve as part of a broader cartel strategy. But without further data, the impact of the information sharing may be difficult to assess. As noted in OECD (2010) “The stand-alone exchange of information raises...significant challenges as it is crucial to recognise whether it resembles more a cartel-type infringement or an efficiency enhancing co-operation.” For a fuller review of the topic of when information sharing is a cartel concern, please see OECD (2010), OECD (2008) and OECD (2012). To the extent that the information sharing is primarily valuable for identifying periods of low demand, for which prices would naturally be lowered, information sharing could yield a higher total quantity of sales than otherwise, which would generally be considered by economists as an efficiency-enhancing effect.

3.4 Variation in gains from cartels to perpetrators is substantial, and it is worth considering whether fines should, at times, vary as a function of consumer harms or illicit gains

28. Given that there is substantial variation in the corporate gains from cartel activity and also in the consumer harms, as indicated by Figure 1 on cartel price increases, it is worth considering whether a deterrence-focused standard would still be effective if customised to a multiple of actual or expected cartel impacts, to the extent their calculation is feasible. For example, in Chile, one objective of the antitrust fines is the recovery of illegal gain (disgorgement), which requires considering the economic benefit obtained from the illegal conduct; the Russian Federation’s regime against violations of anti-monopoly legislation is based on the disgorgement of illegal profits. Clearly, an approach with greater customisation of cartel fines may not be necessary or appropriate in all legal systems. But such an approach may be worth considering where feasible, and may suggest that at least when there is prosecutorial discretion,
competition authorities may wish to calculate, only for internal use, an estimated quantum of harm, illicit gain or both, in order to assess whether the potential fine seems just and proportionate in comparison.

Box 5. Accounting for harm in Germany

Under the German Competition Act (GWB), Article 81(4), as interpreted by the Federal Court of Justice, the German Competition Authority (Bundeskartellamt) must set its fines on the basis of turnover, and with regard, among other factors, to the principle of proportionality and to the gravity of the infringement, of which the infringement’s effect on the market can be considered a component. In this general sense, the extent of the damage caused by the infringement (for instance, the price increase resulting from an agreement) must be taken into account for the purposes of calculating fines. However, this harm need not be quantified or accounted for independently or explicitly.

The German Fining Guidelines explicitly note that for the purpose of determining fines, the calculation the actual effects of the conduct on the market is not relevant. In particular, “a fine which is proportional to the gravity of the case is not to be quantified mainly in terms of its effects on the market”. This would be “incompatible with the general pre-assessment according to the statutory framework of fines”. Moreover, although harm potential and illicit gains can be considered for the purposes of setting a fine, they will not be considered as an isolated or independent factor.

The following cases illustrate how the Düsseldorf Higher Regional Court and the Bundeskartellamt have applied this principle in practice.

A recent judgment by the Düsseldorf Higher Regional Court (OLG) concerns a petition to access leniency documents. When denying this request, the OLG notes that, in any event, the leniency documents did not contain any price information (such as the but-for price) that could be useful for the purposes of damages claims. The reason for this was the fact that under the new fine regulation introduced by the 7th amendment to the German Competition Act, fines are based exclusively on the basis of turnover (determining the cartel surcharge had been necessary to determine fines in the past, but is no longer relevant for fine determination). Therefore, the leniency documents would not provide any information on the extent to which damage to consumers had taken place.

The Courts followed this line in its decisional practice. For instance, when calculating the fine to be imposed in a case concerning household appliances, the Bundeskartellamt made some basic considerations with regard to the impact that the agreements in question had had on the market. However, no details were provided as to how exactly this factor, independently considered, played a role in fine determination.

In the German context, these considerations only apply to the determination of the fine, but not to a finding of infringement. In a case concerning the market for TV advertisement, it was acknowledged that not all the agreements in question necessarily had anti-competitive effects (and some of them were even beneficial). However, the Authority noted that effects are irrelevant for a finding of anti-competitive behaviour (and were only relevant for the purposes of determining whether the conduct is covered by a de minimis, or “appreciability”, exception).

29. Some of the arguments against greater correlation between fines and harm are worth considering. A number of jurisdictions have clear jurisprudence acknowledging the value of inferences of harm, without direct evidence of that harm. In such cases, evaluating harm or illicit gains may simply not be necessary from a legal perspective, though such an evaluation may be of value for prioritising cases by a competition authority.

3.4.1 Simplicity of fine calculation is a reason to avoid considering impact of cartels

30. One argument against customising fines in light of actual harm or gains is based on the constraints of court capacity to evaluate complex economic arguments. This seems to be the approach, for example, implicit in the U.S. Sentencing Guidelines argumentation. Over time, to the extent case law develops extensively on private damage cases in a jurisdiction, the argument may grow less compelling. The argument that court or administrative systems, for simplicity, should use an average indication of fine amount was perhaps true at one time; now, both decision makers and firms are increasingly familiar with
harm estimation techniques. The fact that most major international cartel cases result in follow-on damage claims, meaning that harm amounts are assessed, could contribute eventually to the development of usable standards and techniques for public authorities. To the extent that private damage cases are settled outside courts, though, it is worth noting that case law may not develop sufficiently to guide practitioners, competition authorities and courts on the details of private damage calculations in a given jurisdiction. While the appropriate technique, if any, for calculating harm may differ between individual damage claims and government calculations, decision makers may increasingly be called upon to evaluate harm amounts in some cases and to do so in ways that require substantial effort and corresponding resources. The appropriate legal standard needed to show the level of harm, though, may be a compelling rationale in favour of simple and standard approaches, particularly if proving harm amounts to a criminal standard of beyond reasonable doubt were deemed necessary, as this may in practice be extremely difficult.

3.4.2 Predictability is enhanced by using simple and standard calculations of base fines, with appropriate mitigating and aggravating circumstances.

31. An alternative argument for having simple percentage of turnover standards for base fines is that predictability of fine levels is required for an effective leniency programme. The argument is that when companies are making the calculation of whether to seek leniency, a key variable for them is the expected fine level that the company avoids by seeking leniency. The more uncertainty there is about this amount, the less likely a company may be to seek leniency.

32. If decisions to seek leniency are based on having predictable fines, it is worth noting that alternative methods of fine calculation (such as twice the level of illicit gains) could also potentially yield predictable fine calculations for the purpose of considering leniency. Finally, as noted by Combe and Sévy (2010), there can be a trade-off between predictability and aleas: predictable fines can help companies calculate the likely consequences of an eventual infringement in a too precise manner, whereas less predictable fines will make these calculations more difficult, which would exert a deterrent effect on firms considering committing an infringement.

3.5 Factors to consider that argue against calculating harm or illicit gains

33. While some circumstances suggest there could be reasons to consider the extent of harm or illicit gain in cartel cases, there are a number of factors to consider that also could suggest harm calculations are unnecessary and which are jurisdiction-specific factors. These include:

- Is cartel activity a per se or by object violation of the competition law? If so, further information on effect of the cartel may be unnecessary and, if inserted into decisions or arguments before a judge, could even lead judges to expect otherwise unnecessary information and potentially challenge arguments on harm amounts when all the requisite proof is already present for the violation.

- Are private damage cases regular and successful? If private damage cases are not flourishing, including potentially in absence of government decisions, then a greater reliance must be placed on higher fines by the government in order to move towards more effective deterrence.

- Is calculation of harm or illicit gain so complex that involving it in cases would reduce efficacy of cartel enforcement? If harm calculation reduced the overall efficacy of cartel enforcement, there would be an argument to leave harm calculations to damage cases while focusing fine calculations on easier to assess variables than harm or illicit gain.
There are many reasons for which competition regimes would not provide for the consideration of case-specific harm or illicit gain when determining harm levels. In some jurisdictions, these factors may be more important than others.

Calculation of harm

To the extent that consumer harm or corporate gain calculations are important for determining fines, the competition authority may need or seek to gain some understanding of consumer harm levels or corporate gains, potentially even by quantifying such harm or illicit gains. Such calculations would not be necessary in many jurisdictions. The need for such calculations may thus vary depending on local law, practice and jurisprudence. The calculation of possible, likely or actual cartel harm may occur with different degrees of detail depending on the jurisdiction. Competition authorities very often would not use quantitative evidence due to the difficulties inherent to these calculations (such as the unavailability of relevant data), and the fact that analyses must be undertaken on a case-by-case basis. Some competition authorities use presumptions to overcome these challenges; others prefer to refrain from quantifying harm and instead leave the calculations to private actions in the courts or via settlements.

Box 6. Inferences of harm

Faced with the impossibility or difficulty to calculate cartel harm, some jurisdictions have relied on inferences or assumptions. Australia, New Zealand and the EU provide some examples of this practice.

In the Singapore Air Cargo cartel case, the Australian Federal Court noted that, despite the lack of evidence of the actual economic effects of the conduct, these effects were “likely”, concluding that “all these matters point[ed] to the need for substantial penalties”. The Telstra case discussed in Box [ ] supra constitutes an additional example of the use of harm inferences in the Australian context.

In New Zealand, record cartel fines were imposed in the context of the Koppers case, despite acknowledgement that the harm or effects caused by the price-fixing conduct could not be proven. The Koppers judgments note that “the quantum of any market impact is largely unassessable in cases of breach of the Commerce Act” and that the “actual market impact of actions such as those under scrutiny in this case is very difficult to assess. By how much a truly competitive market was skewed by the offending actions of companies and their officers is extremely difficult to calculate (…)”. Fines were imposed considering, among other factors, the “likely effects on markets and consumers”.

The complexity of harm quantification has also been at stake in the EU. In the Industrial Bags case, the European Commission determined that the impact of the infringement could not be measured with precision. On appeal, the General Court found that the Commission had not breached its obligation to provide a statement of reasons in the contested decision with regard to the actual impact of the infringement on the market. The Court of Justice upheld this decision.

The methods that competition authorities use to make estimates or calculations of harm would not necessarily be the same ones used for private damage claims. In private damage claims, the focus may be on the overcharge effect and the pass-on defence. In administrative proceedings, the main emphasis may be on output effects which measure the negative welfare implications of a cartel; or the price effects, if consumer welfare is the focus of the calculation. In the rest of this section, we focus on the immediate price effects through a consumer welfare approach. It is worth noting that, to the extent the cartel affects intermediate products, the price effect for ultimate consumers may be different from that estimated below.

The main challenge in calculating harm from cartels is to estimate the price and/or quantity that would have existed absent the cartel. While this may be a complex exercise, it is important to recognise that such calculations are at the basis of private damage claims and, while inherently estimates, may provide substantial and useful information about the extent of harm arising from a cartel.
4.1 “But-for” price and quantity

38. The underlying activity of a cartel is to reduce the quantity of a product that is sold and thus raise the price above the level that would otherwise prevail, which we will deem the competitive price. The cartel will instead set a price/quantity level that increases its profits, potentially to a level that is close to or equal to a monopoly price in many theoretical models. It would be unprofitable for a cartel to substantially exceed a monopoly price, so the monopoly price may, in practice, be viewed as an upper bound of cartel pricing.

39. The price that would exist absent a cartel, in the more competitive situation, is sometimes called the counter-factual price or “but-for” price, as it represents the price that would prevail absent the cartel.

Box 7. Detailed calculations of “but-for” prices in Australia

The calculation of the “but-for” prices played an important role in the Australian cement case, which involved co-ordinated anti-competitive conduct and foreclosure. The ACCC submitted financial data to prove the “harm to the functioning of the market” by establishing the “but-for” price which would have prevailed in the relevant market. The Federal Court judge tried to answer the question “by what margin or order of magnitude were the prices in the relevant period higher than they would have been but for the contravening conduct?”. Four different quantitative approaches were tested in order to provide an accurate answer to this question. Eventually, the penalties imposed amounted to a total of USD 18 620 000.

40. The impact on consumers of a cartel can then be represented according to Figure 2 in which \( p_1 \) represents the cartel price, and \( p_0 \) the competitive and counterfactual price, with \( q_1 \) being the cartel’s quantity and \( q_0 \) being the counterfactual quantity sold at the lower price \( p_0 \).

Figure 2. Illustration of cartel harm to consumers with linear demand
41. The harm to consumers from the cartel comes in two parts. The first is from the higher price charged for units that are sold in the cartel. This is represented as the area A. In addition, consumers at the margin suffer, as the price rises above the level that they would otherwise have been willing to pay. This area is represented by a triangle with area B in this simple case of a linear demand function. This area represents a deadweight loss since the loss to consumers in this case is not recaptured by cartelists. The main focus is on ensuring that the area A is well estimated, which means that price is a key variable of focus. In order to estimate the triangular area, knowing the counterfactual quantity sold is also essential.

42. The challenge of calculating a cartel price and non-cartel price is non-trivial. Several alternative approaches are discussed below.

4.2. Simple averages approach

43. In the simplest terms, we can average prices for the cartelised product prior to the cartel period and compare these to an average of prices during the cartel period. Figure 3 illustrates a hypothetical set of price data and shows one version of average prices.

44. In the time series of prices shown in Figure 3, we can see how prices evolved over time for a hypothetical cartelised product. In this figure, there are at least three time periods: pre-cartel, during the cartel and post-cartel. The first vertical line indicates the time at which the cartel began and the second vertical line shows the time at which the cartel ended. The solid price line shows observed prices for the product, while the dotted line indicates the average price across each of the three periods. One approach is therefore to take the pre-cartel price as the expected price during the period of the cartel.

45. Figure 3 illustrates some of the challenges of relying on a simple before and after approach.

46. First, during the period of the cartel, prices are not steady around the average, but actually increase during the initial period of the cartel. So for a substantial period of time, the cartel prices are well below the average cartel price. This sort of observation can be explained by cartels slowly adjusting their
product prices up to a new higher level, to reduce customer dissatisfaction and also reduce likelihood of detection.

47. Second, the pre-cartel period and post-cartel period have different average prices. This raises the question of how to determine the competitive price. Is it only by looking at the price before the cartel? If so, how much time before the cartel should be used? Is it by some combination of the pre-cartel and post-cartel price? If so, how should this combination be calculated? Has there been general inflation over the period of analysis, or specific cost increases related to the product in question that mean the difference between the average cartel price and the pre-cartel price is partly due to cost increases and not to cartel activity?

48. The cement cartel case in Germany illustrates the difficulty of determining competitive prices. The litigation partly revolved around the fact that the Bundeskartellamt had used a price-war period as a benchmark for estimating the cartel overcharge. Further details on this case are included in Box 8.

**Box 8. The German Cement Cartel**

The Higher Regional Court of Düsseldorf reduced almost by half the fines imposed by the German Competition Authority (the Bundeskartellamt) on a cartel case for reasons related to the estimation of cartel effects. Particularly, the Court found that the evidence used to estimate cartel profits was insufficient.

The Bundeskartellamt had fined the six largest companies involved in a cartel in the cement sector a total of EUR 660 million. To estimate the cartel’s additional earnings, the Authority had used the time-based comparative market approach. However, it did not take into account quantity effects, due to the relevant market’s very low short-term elasticity.

The Court assessed the Bundeskartellamt’s findings with the support of an economic expert. The expert used a time-series regression analysis to estimate the cartel’s effects on market prices. Besides establishing the cartel infringement by using the dummy-variable technique, the time-series analysis incorporated different cost-related (such as labour or energy costs) and structural (e.g. HHI) exogenous variables. The expert also considered that the “price war period” which, according to the appellants, had ensued after the detection and breakdown of the cartel, was not a suitable benchmark for estimating the overcharge.

The Court largely followed the expert’s estimate and made, in dubio pro reo, an additional “tentative deduction” of 25% of the estimated additional cartel profits. The Court considered quantity effects in its estimation of the additional earnings, which the Bundeskartellamt had failed to do.

The Court’s conclusions thus differed from the Bundeskartellamt’s with regard to the cartel overcharge and its effects, which led to a significant fine reduction. A subsequent appeal to the Federal Court of Justice failed on all grounds.

Note that this case was addressed under a fining regime that no longer exists and is not the one described in Box 7. The fines regime was changed in part because the prior regime reportedly made it difficult to effectively prosecute cartels because of the required calculation of overcharges.

49. The detailed operational questions for implementing an approach using simple averages to distinguish cartel and non-cartel episodes raise many questions, but using simple averages may be appropriate in some circumstances, particularly if additional data is not available. There is often substantial variation in prices over time that may be confused for cartel effects, either underestimating the effects, or in case of inflation, over-stating them. The existence of such variation suggests that it may be worth having an analysis that is more experimental in approach.
4.3. Comparator markets

50. One technique for taking into account cartel impacts that considers variation is to find comparator geographic markets or physical products that would be governed by similar supply and demand conditions as the cartel market. Differences between the two over the period of the cartel may then potentially be explained by the cartel, while similarities would arise from underlying common causal factors that would be distinguished from the cartel. For example, a cartel in steel pipes from 5-10 cm in diameter might raise prices, while not affecting prices for smaller diameter steel pipes made by other companies and not alleged to be affected by a cartel. It could then be useful to compare the price evolution over time of the two types of products. This type of comparison is illustrated by Figure 4. This figure shows the price of a “control” product against the observed price of the cartel product and the averages of the cartel product. The control product may be the same product from a comparable but different geography from that affected by the cartel, or it may be a product with a comparable cost structure as that of the cartelised product in the same geography.

![Figure 4. Hypothetical control product comparisons](image)

51. In this approach, we may imagine a model in which prices for the cartelised product would be causally related to the prices of the control product. In this case, the cartel would be found to have raised prices in the initial period of its operation more than in the control product, and thereafter held a similar variation to that of the control product. Importantly, in this example, the control product also experienced substantially higher prices during the period of the cartel than before the cartel (and after the cartel), illustrating that part of the supposed cartel price rise that might have been estimated from a simple comparison of before and after may have arisen from cost or demand drivers independent of the cartel. The comparator approach would thus help to ensure that external factors affecting pricing, outside the cartel and during the cartel period, are taken into consideration in the calculation of price differences.

52. The comparator approach is valuable and intuitive to understand. It may be subject to limitations, particularly to the extent that there have been changes in variables in one comparator market that occur for reasons that do not arise in the other market(s). In such an instance, a simple comparator approach may be missing variables, suggesting that a means must be found of including all known relevant variables in the analysis. Regression analysis can do this.
4.4 Regression modelling

4.4.1 General

53. An approach for more rigorously taking forward the comparator approach is to estimate, via a regression model, the relationship between the cartelised market and underlying causal variables of price. Two notable approaches are the underlying causal factors analysis over the lifespan of the product, using a dummy variable during the period of the cartel, and the fitted predictive model based on observations from the time period when there was no cartel.

54. In the first, a model is estimated in which the price of the cartelised product is driven by constant cost shifting variables from each period and demand shifting variables from each period, as well as from those periods with the cartel and those without. The dummy variable would take the value of 1 during the period of the cartel and 0 otherwise. The coefficient estimated on the dummy variable can then be dropped, while running the model on the demand and cost shifters over the entire period to calculate the expected prices absent the cartel. The difference between the model’s actual and expected prices then yields the difference, period-by-period, between the cartel and counterfactual price.

55. In the forecasting model approach, price-determining variables are again used to estimate a model of price, but this time leaving out observations from the period during the cartel. The model estimated is then applied to data on price-determining variables from the cartel period to estimate an expected price. The difference between the actual price and the forecast price, which is known at each separate time period, is then the price increase from the cartel. This forecasting approach leaves out some information from the model estimation, so it may be considered inefficient from a statistical perspective, potentially leading to less precise estimates. However, if the model form for cartel impacts is more complex than a simple dummy, the results from forecasting may be closer approximations to a true model than those of the dummy, even if cartel period information is ignored for estimating the model.

56. A final approach is to use difference in differences analysis. This can yield relatively simple and elegant predictions comparable to natural experiments in which one variable is changed. The approach looks at the difference between the price in the cartel market during the cartel period and the price in comparator markets during the cartel period. If cost or demand variables are comparable across markets, and only the cartel presence is different, the approach may yield a compelling estimate of cartel impacts, perhaps more than simple time series or cross-sectional based estimates of impact. The European Commission’s Practical Guide on quantification of harm for courts and parties involved in damages actions can be a useful document for discussing these approaches, as well as subsequent ones.

4.4.2 Margins

57. A different approach relies on margin analysis. The underlying rationale for focusing on margins is that cartelists focus to a great extent on increasing their margins during the operation of the cartel. Such an approach would calculate a competitive margin, by some means, and then quantify the difference between that margin and the cartel margin. The difference between the cartel and normal margin could be designed to take into account return on capital in the non-cartel period. Key factors for an appropriate margin analysis are that the costs are appropriate, economically speaking, and that a satisfactory basis is found for determining the competitive margin. This approach is further outlined in European Commission (2013).

4.4.3 Simulation modelling

58. A final approach to quantification of harm is to actually calculate underlying demand and cost functions to feed into estimates of a competitive equilibrium and what that would be during the period of a cartel. The competitive equilibrium can be calculated using data, for example, from the non-cartel period.
The difference between the simulated competitive equilibrium and the observed outcome during the cartel period will then yield the differences between cartel prices and outputs and those of the competitive outcome. One particular advantage of a simulation is that its information on the demand function’s shape can feed into a reasoned estimate of the deadweight loss triangle area B in Figure 2. On the other hand, the data requirements for simulation modelling can be substantially greater than for the prior methods discussed, and the model complexity may be substantially greater than for prior approaches as well. Further information on this approach can be found, for example, in Davis and Garcés (2010).

### Box 9. Calculating cartel harm as price increase in Mexico

The Mexican Competition Authority (COFECE) provides an unusual example of routine performance of detailed quantitative analyses of the harm caused by cartels, explicitly for the purposes of determining the amount of the fine (and not just to determine the existence of an infringement). These analyses are in-depth, comprehensive, and evidence-based.

In the major Mitsubishi Heavy Industry case, COFECE carried out a full-blown quantitative assessment of the effects of the collusive agreements on the market. Some claims that the agreements’ effects were minimal or nonexistent had been raised (and supported with evidence) by the parties. COFECE worked on the basis of all the evidence available to determine an estimate of the harm caused, on the basis of which it would set the fine. The harm caused was calculated (using cartel surcharge as a proxy) at over 18 million pesos. COFECE specified that the quantification of harm had only been used for the purpose of determining the amount of the fine, not for determining the existence of an infringement.

Similarly, in the Arquitectura Armónica case, COFECE estimated the price increase brought about by the collusive price-fixing agreements in quantitative terms. This estimated quantum was used as a basis for calculating the sanctions. COFECE specified that the quantification of damage had only been used for the purpose of determining the amount of the fine, not for determining the existence of an infringement. Considerations along the same lines are included in COFECE’s decisions on several other cases, such as ACC, or Transports.

### 4.5. Relation of harm to corporate benefit

The harm from a cartel and the benefit to a corporation are in principle related. Price increases above the competitive level yield both consumer harm and higher profits. The amount of harm that is not recaptured in corporate profits is that encapsulated by the deadweight loss, or B. The smaller the size of B relative to A, the closer the corporate benefit from cartels is to the consumer harm from cartels. In particular, we can suggest that for highly inelastic demand, the ratio of B to A will be very small, while for highly elastic demand, the ratio can be more substantial. This matters to the extent that fines are meant to serve as deterrents in the potential cartelists’ calculation of potential benefit from a cartel to competitive harm. In particular, for products with high elasticity, a lower fine might be needed to deter the cartel compared to another cartel with the same aggregate consumer loss but affecting an inelastic product.
Although the Swedish Competition Authority (SCA) is not obliged to quantify cartel harm for the purposes of calculating fines, in some major cases parties have put forward economic evidence proving the infringements' effects on the market.

The SCA has only cautiously spoken about the value that cartel harm calculation has for competition law enforcement. However, on the basis of its own experience, the Authority has found indications that quantitative arguments on cartel harm have not generally been useful to advance the parties' case (OECD, 2011).

In the petrol cartel case, the SCA called on the Stockholm City Court to impose administrative fines on the five cartel members. The court imposed fines of SEK 52 million in December 2002. In order to illustrate the size of the money transfer from customers to the oil companies, the SCA calculated that, given that the announced price at the pump returned to the normal one month after the rebate adjustment, the customers would lose SEK 500 million over the following five years. The announced price at the pump was lowered by SEK 0.15 at the same time as the rebate adjustment was made. The SCA claimed that the price returned to the normal price after the rebate adjustment, and hired two external economic experts to give expert reports on the pricing on the Swedish petrol market. Shell hired an external economic expert to perform a similar analysis, Hydro did the same, and Statoil, OKQ8, Preem and Hydro hired jointly two external economic experts to criticise the works of the SCA’s external economic experts. Daily data on costs and prices was easily available and shared between the experts. Almost all of the variation in the price was found to be determined by the spot price, the exchange rate and the tax rate. The explanatory value in the regressions was well over 99%. After several rounds of reports, the experts’ analyses nearly converged with one showing a full return of SEK 0.15 and two rejecting a full return of SEK 0.15 and arriving at a return of SEK 0.12-0.13. On appeal, the Market Court imposed fines of 112 million in February 2005. In the SCA’s opinion, the parties did not gain much from their use of economic studies (OECD, 2011).

In 2007, the Stockholm City Court ordered nine asphalt companies to pay more than SEK 500 million in administrative fines in the context of the asphalt cartel case. A subsequent appeal to the Market Court was unsuccessful, despite heavy reliance on quantitative evidence of the cartel’s effects. One of the parties (NCC) had hired an external economic expert to perform a statistical analysis of the bids in the public procurements by the Swedish Road Administration. The expert found no statistically significant difference in winning bids in allegedly cartelised public procurements compared to the winning bids in the control group (of which we had no information regarding cartel behaviour). NCC also hired a consultancy firm to analyse the economic effects of the alleged cartel in the municipalities that had sued NCC for damages. The latter report was meant to be used both in the court process against the SCA and in the damages proceedings. The consultancy firm looked at international price and profitability comparisons and concluded that the price level and the profitability in Sweden were low, something they saw as indicating that the alleged cartel did not have any economic effects. The consultancy firm then used three methods in order to analyse the economic effects of the alleged cartel. First they compared the price during the duration of the cartel with the price after the cartel had been disclosed. Secondly, they compared prices in municipalities where the cartel allegedly operated with the price in municipalities where there was no claim of cartel presence. Thirdly, they calculated the contribution margin during and after the duration of the cartel. They reported no statistically significant effects of the alleged cartel.

Quantification of cartel harm by means of econometric analyses thus gave rise to extensive litigation concerning the methodological approaches used. This was of little use to the parties, who actually saw their original fine increased by SEK 50 million to a total of SEK 200 million.

The Volvo car dealer cartel case provides another example of a party to the proceedings hiring an economic expert to provide evidence that the cartel had not had significant effects on prices. Although this strategy was effective in the first instance, on appeal the SCA brought its own economic expert to contest the validity of the aforementioned report. It also argued that the cartel was an infringement by object and effects did not need to be proven. On appeal, the Market Court found merit in the SCA’s claims.

**Box 10. Sweden: Mixed views about harm calculation**

Although the Swedish Competition Authority (SCA) is not obliged to quantify cartel harm for the purposes of calculating fines, in some major cases parties have put forward economic evidence proving the infringements’ effects on the market.

The SCA has only cautiously spoken about the value that cartel harm calculation has for competition law enforcement. However, on the basis of its own experience, the Authority has found indications that quantitative arguments on cartel harm have not generally been useful to advance the parties’ cause (OECD, 2011).

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5. Conclusion

60. In conclusion, after examining the variation that exists in impacts of consumer harm from cartels, and the related variation in corporate gains, there may be reason to consider whether simple rules that calculate fines based on a percentage of commerce are appropriate across all cases, particularly as some prosecuted conduct may have very small or minor effects, while other prosecuted conduct may have extremely large impacts.

61. In some cases, information to calculate an exact harm level may be lacking. Having said that, for fine sizes that are large, it is particularly important for policymakers and cartel decision makers to assure themselves that the cartel fining system is not only generally just and proportional, but also just and proportional in specific cases. This does not necessarily require publication of estimated harm levels by competition authorities, but may well make at least an internal review desirable to allow appropriate use of prosecutorial discretion. Particularly in light of the increasingly common private damage payments, decision makers and corporations are increasingly familiar with possible techniques for estimating harm.

62. Many open questions remain; at some point, though, individual legal systems must make careful assessments about how and whether their overall approach for prosecuting cartel violations complies with the complex mix of objectives that can include justice, deterrence, punishment and disgorgement. Individual policy tools (such as fines) may not be able to assure all objectives simultaneously, but instead require a consideration of the interaction between different tools (such as fines, damages, individual criminal sanctions, and other possible tools). In the end, jurisdictions must assess the role of their fining rules and whether calculating harms or illicit gains in some cases may be useful, particularly considering the difficulties demonstrated (e.g., Box 10) in carrying out such calculations.
END NOTES


2. See subsection 79 (3.3) of Canada’s Competition Act.


As noted by Schwarze (2004), the increased amounts of antitrust fines could arguably speak in favour of their approximation to criminal sanctions, and could require that the stricter procedural guarantees of criminal law be applied to the imposition of such fines.

5. See, for example, Lianos et el. (2014).

Deterrence is a primary objective of fines in many jurisdictions, as it is viewed as a most effective means to fight cartels than detection. Davies and Ormosi (2014) suggest that deterrence is at least twice as effective as detection as a means for removing harm.


The review of literature carried out by Connor and Lande (2005) shows a probability of 20-24%. Davies and Ormosi (2014) suggest that the harm detected by competition authorities accounts for only a small fraction (at most one sixth) of total potential harm, and that undetected harm is at least twice as large as detected harm.

9. On this point, see, for instance, Combe and Sevy (2010), among many others.

10. As Camilli (2006) notes, deterrence can be at odds with proportionality. Moreover, the possibility of other factors, such as judicial errors, can add to this problem.


The trade-off between accuracy and practicality in the calculation of cartel fines has been discussed in OECD (2011) and by Friederiszick (2011), with reference to the German cement cartel case discussed in Box 8.


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Note that for deterring the formation of cartels, the expected illicit gains may be more relevant than actual illicit gains for those who decide to form the cartel, and deterrence would arise from ensuring expected penalties of all forms exceed expected illicit gains.

One way of saying this is that violation by object may not be sufficient to justify a standardised fine level, while violation by effect, with an effect that is closely related to actual fine levels, and not standardised, may be considered more appropriate as a legal standard. The purpose of this paper is not, however, to enter into the discussion of when and for what purposes violation by object is an appropriate legal standard in competition law cases.


Judgment of the Spanish Supreme Court of 9 December 2015 in case nº 978/2014.


Ibid., par. 102.

Ibid., paras. 110 and 112.

Judgment of the Court of Justice of the European Union of 3 September 2009 in case C-534/07 P.


Levenstein and Suslow (2006), for instance, note that “[c]artels can and do survive as de facto organizations without having a significant effect on price”.

It is worth noting that such markets may be, on average, less likely to foster cartel activity.

OECD (2011).

Judgment of the German Federal Court of Justice nº KRB 20/12 of 26 February 2013.

Judgment of the Higher Regional Court of Düsseldorf nº V-4 Kart 5+6/11 (OWi) of 22 August 2012.

Decision of the German Competition Authority nº B7-42/06 of 25 April 2007.

Decision of the German Competition Authority nº B7-22/07 of 27 December 2012.

See supra note 18.


Judgment of the General Court of 16 November 2011 in case T-79/06.

Judgment of the Court of Justice of the European Union of 26 November 2013 in case C-40/12 P.


A comprehensive overview of the economics of collusion can be found in Davis and Garcés (2010).

With a curved demand function, as in a constant elasticity of demand case, the area is not a triangle but can be approximated to a first degree by a triangle or, with more information on the shape of demand, an integral under the demand curve.


Useful academic discussions of these techniques can be found in Friederiszick, H.W. and L.H. Roller (2010), Huschelrath, Muller and Vieth (2012) and Frank and Schliffke (2013).

For example, if cartels do not immediately move to a cartel price but instead build up gradually, a dummy approach will yield an underestimate of the equilibrium cartel price.


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