

THE ECONOMICS OF CALCULATING DAMAGES

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In a market economy there are three basic reasons why the laws should provide for the award of damages to parties harmed by illegal economic activity:

- To bring justice to the injured party. This involves compensating the harmed party for the loss arising from the injury. Just compensation requires returning the injured party to a state of affairs as if the injury had not occurred at all. In the literature this has been referred to as “making the plaintiff whole”². In European Law this has been articulated as a principle of “full compensation”, with victims of the infringement entitled to an amount equal to the actual loss (*damnum emergens*), profit lost (*lucrum cessans*), and including interest forgone from the time the damage occurred until the time the capital amount is paid³.
- Making sure that the perpetrator does not profit from its illegal activity; i.e. ensuring that there is no “unjust enrichment”⁴.
- Deterrence: providing disincentives to others from breaking the law or repeating the illegal act.

The nature of a damages claim will depend on the legal framework in a particular jurisdiction⁵. The legal framework determines who may bring a claim and what the requirements are for establishing causation. The applicable legal framework will also determine whether damages suffered by direct customers are reduced by the price

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² [7(89)] Economic Analysis and Antitrust Damages. Franklin M. Fisher

³³ White Paper on Damages and Actions for Breach of the EC Antitrust Rules, COM(2008); and Commission Staff Working Paper Accompanying the White Paper on Damages Actions for the Breach of the EC Antitrust Rules', SEC(2008) accessed at <http://ec.europa.eu/competition/antitrust/actionsdamages/index.html>

⁴ [7(86)] Towards an Economic Theory of Unjust Enrichment Law, Niva Elkin-Koren, Eli M Salzberger.

⁵ [7(103)] Study on the conditions of claims for damages in case of infringement of EC competition rules: analysis of economic models for the calculation damages.

increases they pass on to their customers. Whatever the legal framework, it is generally the case that a damages claim seeks to return the claimant to the financial position it would have attained were it not for the infringement⁶. This is the key principle underlying the calculation of the damages claim. In order to estimate damages one must develop an accurate counterfactual which can be compared with the factual as experienced by the claimant. Once this has been done the difference between the counterfactual and the factual must be converted into a final value for the damages claim.

In establishing methods for calculating damages claim (i.e., correctly identify the factual and counterfactual and converting the difference into a damages value) it is important to strike a balance between the conflicting objectives that arise (a) from the difficulties with determining the most accurate possible calculation and (b) with ensuring access to justice through private damages. If too much weight is placed on determining the most accurate damages value possible a successful damages claim may prove almost impossible given the methodological difficulties that arise. Ensuring access to justice through private damages claims requires an approach with clear rules that are easy to apply.

If the plaintiff is to be made whole (or the principle of full compensation applied) there must be some degree of precision in the estimate of the damages value so that courts can be satisfied that there is neither under nor over compensation of victims. An exact number would require complete information on the factual and the counterfactual. As this is impossible the counterfactual must be simulated using economic and financial models with simplifying assumptions. This is a complex and contentious process in which the assumptions are challenged and requiring considerable analysis of data and information. The degree of complexity allowed in the process of estimating an accurate damages value will depend on the applicable national policy and legal framework. Some countries will seek to remove obstacles to private damages claims by simplifying the process, whereas others will abide by a more stringent legal framework that insists on

⁶ [7(94)] Quantifying antitrust damages: towards non-binding guidance for courts, OXERA study prepared for the European Commission.

precision when it comes to calculating damages. For example, in Sweden the courts awarded damages of a relatively small amount against a firm that had abused its dominance in the supply of CD-ROM copies because the claimants had failed to provide sufficient evidence regarding the correct quantum of the damages claim.⁷ However, in Italy, in a case involving a car insurance cartel, the Supreme Court ruled that where precise estimation of the damages claim is difficult it is permissible for courts to invoke Article 1226 of the Italian Civil Code and award an equitable amount of damages – *ex aequo et bono*⁸. The Italian Supreme Court noted that the use of “probabilistic presumptions” is permissible in such cases. Although courts were required to take into account all evidence aimed at rebutting presumptions it would nevertheless be “permissible for the judge to use presumptions to evaluate the loss suffered by a claimant”⁹.

In this chapter we examine the economics underlying various approaches to developing the counterfactual and provide an overview of methods employed for converting the difference between the counterfactual and the factual into a damages value.

Developing the counterfactual

In order to develop an accurate counterfactual the nature of the harm done to the claimant must be properly characterized. The nature of the harm done depends on the type of infringement. For the purpose of this paper we focus on cartel conduct, though other types of infringement are harmful in their own way and may be subject to damages claims.

- Nature of harm arising from cartel conduct

⁷ In *Europe Investor Direct Aktiebolag v VPC*, Judgement of November 20th 2008 Cases T 32799-05 and T 34227-05 Stockholm District Court.

⁸ *Fondiarria SAI SpA v Nigriello*, February 17 2007 Judgement Corte di Cassazione (Italian Supreme Court).

⁹ Quoted in *Quantifying antitrust damages: Towards non-binding guidance for courts*, Oxera Study prepared for the European Commission, December 2009, page 6.

The typical cartel arrangement is one in which firms collectively fix prices at a higher level than that which would have emerged under competition. Such a price increase is also likely to go together with a reduction in output. This affects the direct purchasers in two ways. Firstly; purchasers who buy the product pay a higher price and are thus effectively denied the lower competitive price. Secondly; there are purchasers who would have been willing to trade at the competitive price whose foregone purchases are reflected in the reduced volumes associated with the higher price of the cartel.

This situation is reflected explicitly in figure 1, which shows the overcharge paid on all the units actually sold (area A) and the lost volumes associated with would be purchasers who would only have been willing to trade at the competitive price (area B).

[see diagram page 14 Oxera document]

In this scenario the cartel price is at P_m and the counterfactual price is at P_c . The cartel quantity is at Q_m and the counterfactual quantity at Q_c . The cartel overcharge is equal to the number units actually sold by the cartel multiplied by the difference between the price actually charged by the cartel and the price that would have been charged had there been no cartel (the counterfactual price:

$$\text{Cartel Overcharge} = Q_c(P_m - P_c)$$

The overcharge can be expressed as a percentage of the actual price or revenue of the cartel. In this way the total amount of the overcharge is calculated by applying the percentage to the amount that the buyer actually paid for its purchases. For example, if the cartel price is R100 and the counterfactual price is R90 the cartel overcharge would be 10% (R10 is 10% of R100). If the cartel sold 2 million units at a price of R100 the total overcharge would be R20 million.

If a particular customer could demonstrate that its total purchases from the cartel amounted to R8 million then the amount it was overcharged is 10% of R8 million – i.e. R800 000. This amount constitutes cartel overcharge harm and can be legally claimed by the customer of the cartel. The customer could be an end consumer or an intermediate purchaser of some input product produced by the cartel.

The harm arising from the lost volume effect is reflected in area B in figure 1. In economic theory this is known as a deadweight welfare loss. As noted above, purchasers who would have been willing to trade at the counterfactual price but not at the cartel price are not served by the cartel. The excluded consumers are harmed as a result. However, for purposes of a damages claim it may be difficult to identify the harmed parties – particularly those who did not purchase at all during the period of the infringement but would have purchased product at the competitive price. In practice damages claims are typically brought by parties that were actual purchasers of the cartel during the infringement period¹⁰.

Other forms of hardcore cartel conduct are likely to cause similar harm. For example, a cartel that allocates customers will give each cartel member monopoly power over their allocated customers allowing them to raise price and restrict output relative to the competitive counterfactual. Likewise, a geographic market allocation will produce similar outcomes in the allocated markets. Other cartels may fix quantities rather than prices. The restriction in output and the corresponding increase in price is harmful in the same manner as that of a price fixing arrangement. Bid rigging is also a form of cartel conduct with effects similar to that of a price fixing cartel.

There are also longer term effects arising from cartel activity. By reducing rivalry among firms cartels reduce incentives for innovation and slow the pace at which improvements in efficiency can be achieved. Cartels in input product markets may distort downstream markets if reduced volumes lead to excluded purchasers and thus potentially more concentrated downstream markets. These dynamic effects may also factor into the

¹⁰ 7(11) Antitrust damages and deadweight loss, Christopher Leslie.

damages calculation. This is because such long terms effects may affect the counterfactual price. For example, the counterfactual price may have been much lower if there had not been a cartel as cost reducing innovations would have been more likely in a competitive market. In such circumstances the cartel overcharge would be higher. However, establishing a causal link between the infringement and the long-term harm is likely to be difficult in practice.

- Parties harmed as a result of cartel conduct.

In establishing a causal link between the harm suffered by the claimant and the infringement it follows that the claimant must fall within a category of parties that are capable of being harmed by the activity of a cartel. In its study for the European Commission on quantifying antitrust damages Oxera set out seven categories of “potentially affected parties in a typical supply chain”¹¹:

- **Direct purchasers (customers) which are intermediate sellers (producers, distributors, or retailers).**

Direct purchasers are customers who buy directly from the members of the cartel. The degree of harm suffered by the customers will depend on the extent to which they pass on the cartel overcharge to their own downstream customers.

- **Indirect purchasers, which are intermediate sellers (producers, distributors or retailers).**

Indirect purchasers are customers who buy from firms who are downstream from the cartel members. These purchasers suffer harm if the cartel overcharge (or some portion of it) is passed on to them by the direct customers of the cartel.

¹¹ 7(94)

- **End-consumers.**

Consumers purchase either directly or indirectly from cartel members. End-consumers who purchase directly from the cartel suffer the full extent of the overcharge. However, this overcharge will be diminished in the case of indirect purchases as it is passed through successive layers of the supply chain.

- **'Counterfactual' customers.**

These are the excluded customers who would have purchased product at a competitive price but for the cartel. These customers have suffered harm in effectively being denied access to product they would have purchased at the competitive price or have had to purchase suboptimal alternatives.

- **Competitors.**

It is unlikely (in theory at least) that competitors would suffer direct harm from cartel conduct. They are likely to benefit from the higher prices of the cartel. However, the activities of a cartel may extend beyond mere price fixing. For example, a cartel may refuse to supply to customers that have previously switched away from the cartel in order to discourage such switching in future, reduce the sales of non-cartel members and keep customers captive of the cartel.

- **Suppliers.**

As a consequence of the restricted output of the cartel fewer inputs might be required thus reducing volumes sold by suppliers.

- **Firms in connected markets.**

A cartel in a complementary product market may raise costs in a connected market potentially depressing activity in that market.

Market characteristics and implications for assessing damages

In assessing damages it is important to identify the type of market in which the infringement occurred, as well as the features of that market.

In *Quantifying Antitrust Damages* OXERA make the following distinctions between types of markets with reference to the calculation of damages:

- Intermediate goods versus consumer goods

The main distinction here pertains to the role and level of any pass-on of the overcharge. For end consumer goods there is clearly no further scope for passing-on. However, for wholesale and input markets harm may be done along a long supply chain. The stage at which the harm occurs and pass through 'ends' would have to be assessed on a case by case basis.

- Mature versus rapidly evolving markets

The authors note that the duration of anti-competitive harm will differ depending on the level of maturity of the market. So-called 'mature' markets are stable and less susceptible to disruptive changes. In such cases anti-competitive arrangements may endure for longer. However, in rapidly evolving markets any harm is likely to be short-lived as the competitive environment is in a state of flux.

- Differentiated versus homogeneous goods

Although homogenous goods markets are more susceptible to collusive arrangements they are also potentially very competitive. This means that the magnitude of the harm suffered in homogenous product markets (compared to the competitive counterfactual) may be greater than in the case of differentiated product markets where some degree of market power is inherent under competitive conditions. The authors also note that “conditions in homogenous goods markets can sometimes be more predictably modelled than in differentiated product markets, and therefore the counterfactual competitive price or output may be more easily determined”¹².

- International markets versus national or local markets

In order to determine the harm caused by the infringement it will also be important to identify the scope of the geographic market. The authors note that the estimation of the damages may be complicated depending on whether the conduct has taken place across borders or within national borders. Cross-border competitive dynamics pose challenges for the assessment of the counterfactual and the data analysis (e.g., differences in currency and taxation).

- Bidding markets versus traditional markets

According to the authors bidding markets need to be modelled differently than traditional markets when it comes to assessing the counterfactual in a simulation exercise. They note that sometimes “the outcomes in bidding markets can be more predictably modelled than ‘normal’ oligopoly markets”¹³.

Once the market has been identified the particular features of that market must be evaluated in order to understand the implications for the counterfactual and the estimation of damages:

¹² [7(94)], page 28

¹³ It is important to distinguish between bidding markets and bid rigging. Bid rigging may take place in respect of tendering processes which may not be considered as bidding markets.

- The structure of the market

The basic structural features of the market are important to understanding the nature and extent of the harm. An assessment of these features include determining the number of competitors and their respective market shares, whether the market is growing or shrinking, the history of entry and exit, and changes in prices and output of firms over time. Understanding the characteristics of the affected product is also important. This includes: identifying substitutes and complements, and assessing the degree of differentiation and customer loyalty.

- The structure of the supply chain

Evaluating the structure of the supply chain entails identifying the degree of vertical integration and the contractual and commercial arrangements that exist between manufacturers, suppliers, distributors, and customers.

- Pricing and costs

It is important to understand the impact of infringer's pricing over time. This involves examining pricing conventions in the industry in order to ascertain what drives changes in prices over time. In addition, the key drivers of the costs of production must be understood. This entails unpacking the components of fixed and variable costs as well as ascertaining the extent to which economies of scale influence changes in prices and costs.

Using the results of the counterfactual analysis to determine the final damages value

The results arising from the counterfactual analysis must be organised and inputted into a financial valuation model to calculate the final damages value. There are two main parts to this:

- Calculating the cartel loss. In cartel cases there is generally only one kind of loss considered, i.e., the cartel overcharge. Cartel overcharges and methods of calculation are discussed in the next section. However, there are cases where the loss of volume arising from the cartel harm may also factor in the damages claim. In such cases a monetary value for the cartel overcharge loss would have to be added to the monetary value for the volume loss.
- Adding up the losses over time. Cartel infringements often take place over many years. As a preliminary stage in the process a cartel overcharge may have been estimated for each year of the infringement. To determine a single monetary value the yearly cash flow would have to be added up. In order to ensure fair compensation the calculation would have to account for the time value of money. This is discussed below, after addressing methods for calculating cartel overcharges.

Cartel overcharges and methods of calculation

In this section we focus on the case of a damages claim brought by a direct purchaser that has suffered harm as a result of a cartel infringement. Where such a cartel infringement has occurred it is not unreasonable to infer that the overcharge of the cartel exists and can be quantified as some positive amount. This is supported by empirical data which suggests that most cartels that have been studied do indeed have a positive overcharge. The following table summarizes the findings of the important studies conducted and indicates the number of cartels studied and the median value of the overcharge.

Table 1: Studies Estimating Cartel Overcharges

STUDY	NO. CARTELS STUDIED	MEDIAN VALUE	OF
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		CARTEL OVERCHARGE ¹⁴
Posner (2001)	12	28%
OECD (2002)	14	13% - 16%
Werden (2003)	13	15%
Conner and Lande (2008)	674 observations from 200 research papers	20%
Oxera (2009)	114 observations filtered for robustness from the Conner and Lande study	18%

The OXERA study found that the cartel overcharge is positive (i.e. above zero) in 93% of the cases studied. This provides some empirical support for the theory that the cartel overcharge is positive. However, it also demonstrates that there are a small but significant number of cartels where there is no overcharge. It is possible that the greater proportion of cartels with positive overcharges arises from the fact that the empirical studies focussed on functional cartels that impacted significantly on the affected markets¹⁵.

It would therefore be necessary to determine with reference to the facts of a particular case whether or not the cartel overcharge is positive. Put differently, an assessment would have to be done of the extent of the economic benefit accruing to the firm as a result of the cartel activity. In Berliner Transportbeton the court maintained that the greater the durability of the cartel (in terms of duration and geography) the “higher the requirements that have to be imposed on a court if it wants to deny that the cartel agreement produced any economic benefits”¹⁶.

¹⁴ Expressed as a percentage of the actual cartel price i.e., the total cartel overcharge is calculated by applying the percentage to the amount that the buyer of the cartel actually paid for its purchases.

¹⁵ 7(94) page 91

¹⁶ Oberlandsgericht Dusseldorf, Berliner Transportbeton I, KRB 2/05.

In Landgericht Dortmund¹⁷ the court assumed that the cartel overcharge would be positive and based its calculation of damages on the difference between the price charged by the defendant during the cartel period and the lower price post cartel.

Although it may be relatively straightforward to establish the likelihood that economic benefit accrued to the cartelists the quantification of the cartel overcharge is required if a damages value is to be determined. We discuss the following methods for calculating cartel overcharges¹⁸:

- The “before-and-after” method
- The “yardstick” approach
- The cost based approach
- Econometric price prediction
- Simulation

These approaches are complementary and are often used in combination to ascertain whether they yield the same results and to test the robustness of the estimates.

- The “before-and-after” method

This approach simply involves comparing the prices that prevailed during the period of the cartel with the prices that prevailed post (or pre) cartel, assuming that the post or pre cartel prices approximate those that would prevail in the absence of the cartel. The benchmark period should ideally consist of long run equilibrium prices averaged over a sufficient period of time. It is therefore important to assess the conditions under which prices have been determined during the benchmark period.

- The “yardstick” approach

¹⁷ Landgericht Dortmund , Case Number 13 O 55/02 Kart – Vitaminpreise, 1 April 2004.

¹⁸ [7(103)] Study on the conditions of claims for damages in case of infringement of EC competition rules

With the yardstick approach the cartel prices are compared with a similar market where there has not been cartel conduct. It is important that the benchmark market have similar competitive characteristics to the cartelized market. The approach is only likely to work if the comparator markets are sufficiently similar such that differences in the prices between the two markets can be reliably attributed to the cartel.

- Cost-based approach

This approach involves calculating the average unit cost of production of the members of the cartel and estimating a competitive price by adding a profit margin that would approximate that attained under competitive conditions. The constructed cost based competitive price may not be an appropriate benchmark and there may be difficulties in estimating profit margins given changes in the business cycle, rewards for innovation, risk taking and efficiency improvements.

- Econometric price prediction

This involves more sophisticated version of the benchmark and yardstick approaches applying techniques of regression in which counterfactual prices are estimated on the basis of historical relationships between prices and other variables.

- Simulation

Simulation models apply industrial organization theory to simulate an oligopoly structure for purposes of estimating the counterfactual price. There are a variety of models of oligopoly behaviour that may apply depending on the characteristics of a particular market.

Accounting for the time value of money when calculating the final damages value

As noted above, many cartel infringements take place over a number of years. This means that the cartel overcharge calculated in each year would have to be added up over the duration of the infringement. If the principle of compensation¹⁹ is to be applied – i.e. if the “plaintiff is to be made whole” – then the implications of the time value of money on the final damages calculation must be considered. In practical terms this means determining how interest is to be applied and determining the manner in which uprating and/or discounting of cash flows is to be done.

Simply put the time value of money refers to the fact that R1 today is worth more than R1 tomorrow. In order to determine the present (current) value of a series of cash flows an appropriate discount factor must be used. The following simple example (based on the Oxera report) is illustrative:

If an infringement resulted in the victim losing R100 during each of the past five years, each year’s loss must be uprated using the discount rate to determine the current (present) value of the harm suffered. A discount rate of 10% per year is assumed. The harm from the first year is calculated as R161.05 (R100 times 1.10 to the power of 5 – i.e. uprated five times). The harm from the second year is updated 4 times (R100 times 1.10 to the power of 4 = R146.141). Applying the same formula for the third, second, and first year and then adding up the five years produces the present value of the total harm over the five years equal to R671.56.

Future losses may also form part of the harm suffered – e.g. if the victim cannot immediately recover the market position it would have been in had there been no infringement. If losses will be incurred by the victim in the next three years then this would need to be added to the present value of the harm over the first five years. Assume the losses are R75, R50, and R25 with a discount rate of 10%. R75 occurs in the current year and is thus not discounted. R50 in the next year is discounted once

¹⁹ European Commission (2008b), p. 57. Joined cases C-295/04 to C-298/04 Vincenzo Manfredi and others v. Lloyd Adriatico Assicurazioni SpA and others [2006] ECR I-6619. In this case the principle for compensation is that the award for damages should include “interest from the time the damage occurred until the capital sum awarded is actually paid”

(R50 divided by 1.10 = R45.45); R25 in two years' time is discounted twice (R25 divided by 1.10 to the power of 2 = R20.66). The present value of the total harm over the entire eight years would then be R812.68.

The choice of discount rate can have a significant impact on the size of the damages value. In the previous example, if a discount rate of 5% is used instead of 10%, the present value of the damage from the past five years would be R580.19 instead of R671.56. The choice of discount rate should be based on economic criteria. However, statutory rates of discount may be prescribed in some jurisdictions²⁰.

Summary and Conclusions

This chapter addressed some of the economics underlying approaches to calculating damages. The main guiding principle is that the victim be returned to the financial position he or she would have been had the infringement not occurred. This involves identifying the counterfactual and then converting the difference between the counterfactual and the factual into a monetary amount constituting the damages award. In cartel cases this will generally be reflected in the calculation of a cartel over charge. This basic process is not in itself contentious. However, the methodology employed to identify the counterfactual and the method for calculating the damages value is likely to be greatly contested by claimants and respondents alike.

Rather than being based on the selection of a single methodology the final damages claim awarded by a court is likely to be the one that is consistent with the application of a variety of methodologies and 'robust' in the sense that the underlying assumptions are realistic given the actual economic and market characteristics of the infringers and their victims. Therefore detailed and sophisticated economic analysis and complex financial

²⁰ The question of the appropriate interest rate is examined at a conceptual level in Franklin M. Fisher *Economic Analysis and Antitrust Damages* World Competition 29(3): 383 – 394: 2006. [7(89)]

valuations are likely to characterise court proceedings on the calculation of damages awards.