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Frank Maier-Rigaud & Ulrich Schwalbe[1]

I. INTRODUCTION

Claims for damages caused by violations of Article 101 and 102 Treaty on the Functioning of the European Union ("TFEU") are viewed as an important private enforcement complement to the public enforcement of competition law by the European Commission ("EC") and National Competition Authorities ("NCA's') in the European Union.[2] There is an increasing amount of claims for damages, in particular as follow-on claims. When a claim for damages is presented in court, and compensation for the harm suffered is sought, quantifying the level of the damage suffered becomes necessary. In the last few years several theoretical and applied studies investigating the fundamental economic principles and empirical-econometric methods to determine damage have been presented with the aim to guide the courts on how to quantify damages and what amount of damages to ultimately award.[3] This debate has been further fuelled by the EC's proposed Directive with the aim of facilitating such claims that would provide for a common framework within which damage claims should be treated by National Courts.[4]

As is generally accepted under EU law, and has been stated by the EC, "[c]ompensation for harm suffered aims to place the injured party in the position in which it would have been had the infringement of Article 101 or 102 TFEU not occurred: the

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[2] A comprehensive legal overview can be found in DAVID ASHTON & DAVID HENRY, COMPETITION DAMAGES ACTIONS IN THE EU: LAW AND PRACTICE (2013). The relevant Commission documents ranging from the Green to the White papers can all be found on the Commission webpage: http://ec.europa.eu/competition/antitrust/actionsdamages/documents.html.

[3] For recent overviews *see*, for example, Frank Maier-Rigaud & Ulrich Schwalbe, *Quantification of Antitrust Damages*, COMPETITION DAMAGES ACTIONS IN THE EU: LAW AND PRACTICE (D. Ashton & D. Henry eds. 2013), *available at* http://ssrn.com/abstract=2227627 and Roman Inderst, Frank Maier-Rigaud, & Ulrich Schwalbe *Quantifizierung von Schäden durch Wettbewerbsverstöße*, HANDBUCH DER PRIVATEN KARTELLRECHTSDURCHSETZUNG (A. Fuchs & A. Weitbrecht eds. 2014)*, available at* http://ssrn.com/abstract=2231962.

[4] *See* European Commission Proposal for a Directive of the European Parliament and of the Council on certain rules governing actions for damages under national law for infringements of the competition law provisions of the Member States and of the European Union, COM(2013) 404; the Communication from the Commission on quantifying harm in actions for damages based on breaches of Article 101 or 102 of the Treaty on the Functioning of the European Union, C(2013) 3440; and the European Commission Staff Working Document – Practical Guide on Quantifying Harm in Actions for damages based on breaches of Article 101 or 102 of the Treaty on the Functioning of the European Union, SWD(2013) 205, all from November 6, 2013.

actual position of the injured party has to be compared with the position in which this party would have been but for the infringement."[5]

This mandate comprises three aspects, the price effect (*damnum emergens*), the quantity effect (*lucrum cessans*), and interest on the damages.[6] Using the example of a cartel, the price effect is the harm suffered by a purchaser of the cartelized product due to the effect of the price increase on its margin. It is related to the concept of overcharge, which is simply the quantity that the purchaser continues to buy multiplied by the price difference. The price effect is the overcharge adjusted for pass-on. The quantity effect, in turn, denotes the loss of profits of the purchaser of the cartelized product due to a reduction in sales resulting from (partial) pass-on.

Both price and quantity effect combined make up the harm that conceptually is equivalent to the difference in profits (or utility if final consumers are concerned) between the situation that would have prevailed in the absence of the infringement and the factual situation. Therefore, if the entire harm suffered from competition law infringements is to be claimed, then the calculation of damage should not be just a quantification of price effects, but also needs to quantify harm deriving from quantity effects.

In addition, while the discussion has generally focused on harm emanating from cartel infringements, the quantification of damage in abuse of dominance cases remains largely unexplored. The purpose of this article is to shed some light on the important role of quantity effects as part of the damage, and the particular challenges for the calculation and the assessment of harm in the context of Article 102 TFEU.[7]

II. QUANTITY EFFECTS

A. Price and Quantity Effects, Overcharge, and Pass-on[8]

In the draft Directive the treatment of quantity effects remains underdeveloped despite the fact that the importance of such effects is clearly acknowledged by both the Courts and the EC. Instead of treating price and quantity effects at par, a lot of effort is devoted to discussing price effects in terms of overcharge and pass-on. The reason

[5] *See* ¶11 in European Commission Staff Working Document – Practical Guide on Quantifying Harm in Actions for damages based on breaches of Article 101 or 102 of the Treaty on the Functioning of the European Union, *id.*

[6] The terms used by the Court and the Commission are actually "loss suffered" (*damnum emergens*) and "loss of profit or volume effect" (*lucrum cessans*). These terms are at least partially influenced by considerations concerning the burden of proof and may not be identical to the economic concept of damage. Only if *damnum emergens* is interpreted as total overcharge net of pass-on does it correspond to what economically could be called the price effect. *Lucrum cessans*, in turn, corresponds to the quantity or volume effect.

[7] A third, somewhat neglected but important factor is that harm from competition law infringements arises not only within a vertical value chain but can affect a wide range of economic actors. This aspect is treated in detail in Maier-Rigaud & Schwalbe, *supra* note 3 and Frank Maier-Rigaud, *Toward a European Directive on Damages Actions*, J. COMPETITION L. & ECON., forthcoming, *available at* http://ssrn.com/abstract=2296843. The related and also very important issue of umbrella effects is discussed in detail in Roman Inderst, Frank Maier-Rigaud, & Ulrich Schwalbe *Umbrella Effects*, J. COMPETITION L. & ECON, (forthcoming, 2014), *available at* http://ssrn.com/abstract=2297399.

[8] A more detailed treatment of the arguments presented here can be found in Maier-Rigaud, *id.*

seems to be the powerful normative effect of the U.S. legal situation, where the focus is mainly on price effects.

However, damages claims on the U.S. federal level are restricted to direct purchasers who consequently are allowed to claim the overcharge, i.e. the total downstream damage based on price effects. The concept of pass-on there derives its existence from the fact that in some U.S. states, by contrast, indirect purchasers are also allowed to claim damages. Pass-on then allows the calculation of price effects on different levels of the value chain starting from the overcharge.

Such a decomposition of damages into an overcharge, pass-on, and a quantity effect is justified in a jurisdiction where quantity effects are not legally recognized as a head of damage and where only direct purchasers have standing (with the passing-on defense barred). Under these conditions, it is sufficient to calculate the overcharge and disregard both the quantity effect and the price effect (pass-on adjusted overcharge). But this has of course nothing to do with either an economically sound assessment of harm[9] or with the clear framework set out by the EU Courts. *Full* compensation for *any* victim automatically limits the utility of categories such as overcharge and pass-on.

Probably the mere existence and, at least, the preponderance of concepts such as overcharge and pass-on is due to very specific (controversial) legal choices made in the United States. It should be clear that these concepts are ill-suited in an EU context in particular if they divert attention away from quantity effects and therefore stand in the way of full compensation.

B. The Relationship Between Price and Quantity Effects

If quantity effects were of relatively negligible magnitude compared to price effects, this could justify the non-existing role quantity effects have in the United States and also the limited role of quantity effects in the EU. This section briefly sets out some arguments why the magnitudes of these effects are likely to be at least comparable and why it should not be legitimate to set quantity effects aside on the basis of an allegedly limited empirical or practical relevance. As a more detailed discussion of the arguments presented here can be found in Maier-Rigaud[10] all arguments will be presented on the basis of Figure 1, summarizing the results of the model used.[11]

Figure 1 depicts damages in the case of a cartel. In the graph on top, Figure 1 depicts the total damage due to price and quantity effects and, in the (only partially

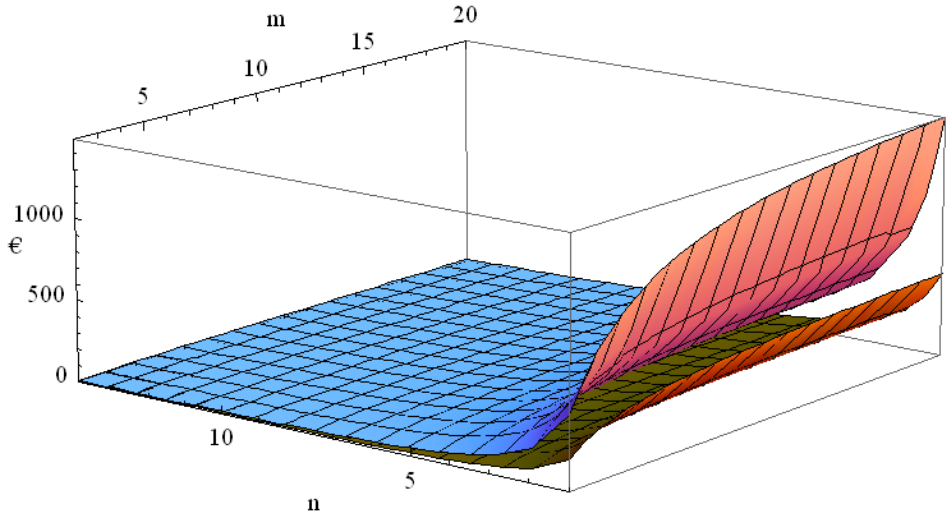
[9] The economic problems associated with the U.S. approach from a compensatory perspective have been clearly recognized; for example, by Jeffrey Harrison, *The Lost Profits Measure of Damages in Price Enhancement Cases*, MINNESOTA L. REV, 64, 751-788 (1980).

[10] *Supra* note 7.

[11] The underlying model is based on a three-level value chain where *m* producers sell products to *n* retailers who sell to final consumers. Both wholesale and retail competition is modeled as homogenous product Cournot markets. Final consumers are characterized by a standard linear demand and the underlying factual scenario is characterized by a cartel of producers, i.e. *m=1*, which is given by the monopoly solution. While this is not the only model that could be used to inform the relative importance of price and quantity effects as other demand systems could be employed, it should be noted that the Cournot model is one of the standard workhorse models in competition economics.

visible) graph below, the damage due to the price effect only. The difference between the two non-linear graphs is, of course, the damages due to the quantity effect.

Figure 1: Total harm (price and quantity effect) and harm suffered by price effect alone for a representative retailer depending on different producer counterfactuals and retail markets.



There are *m* upstream firms selling to *n* direct purchasers who sell to final consumers. The higher the counterfactual number of upstream firms *m*, the larger the cartel effect. The *m* values in the Figure depict different possible cartel versus Cournot-Nash equilibrium outcomes, depending on the number of upstream firms in the market. The same applies to the number of firms on the retail market denoted by *n,* which represents different assumptions concerning both the factual and the counterfactual scenarios (as no changes concerning the number of firms are assumed on the retail level).

The relative importance of the quantity effect is particularly noteworthy for higher ranges of *m*, implying that the higher the degree of competition in the counterfactual, the more pronounced the effect will be. This is not surprising as effects cannot be very pronounced if the counterfactual is already characterized by limited competition. The Figure clearly suggests the importance of the quantity effect for lower values of *n* and, to a lesser extent, also for higher values of *m*.

C. Quantification from a Plaintiff's and a Defendant's Perspective

From the perspective of a plaintiff, who has the right to full compensation for harm suffered under EU law, reinvigorating quantity effects as an important head of damage appears beneficial throughout. However, there are also benefits for the defendants. As harm suffered by plaintiffs from price effects is overestimated if only the overcharge is considered, the passing-on defense allows defendants to adjust the overcharge by the amount passed on, thereby determining the harm suffered from the

price effect.[12] The Commission could have linked the (rebuttable) presumption on price effects, namely that the entire overcharge corresponds to the price effect unless pass-on is demonstrated, with a (rebuttable) presumption on quantity effects—something that is economically conclusive.[13]

If the harm suffered from the price effect is presumed to be the overcharge, the harm suffered from the quantity effect must be zero. Furthermore, if the passing-on defense of a defendant is successful, this implies that it was possible to properly quantify the pass-on from the direct purchaser to the indirect purchaser. This typically also implies that the plaintiff was harmed from a quantity effect.

The overcharge hast two relevant economic properties. The first property is that the price effects, i.e. the pass-on adjusted overcharges along the vertical value chain, add up to the original (the pass-on unadjusted) overcharge. The second property relates to the quantity effect. If there is no pass-on—so that the overcharge is identical to the price effect—there can also be no quantity effect. In turn, if there is pass-on and the overcharge therefore overestimates the true harm from the price effect, there generally will also be harm from a quantity effect.

A plaintiff should therefore benefit from a (rebuttable) presumption that this pass-on implied a quantity effect of at least the size of the pass-on. This would require the defendant to show first that part of the overcharge was passed on, reducing its liability on overcharge damage, and to then show that the quantity effect is less than the amount passed on. If only the former is shown, the presumption would imply that the quantity effect just offsets the pass-on, which is similarly accurate to the presumption that overcharges are equal to the price-effect.

From the perspective of a defendant it is not immediately obvious why an *at par* treatment of price and quantity effects would be useful. *A priori*, a defendant seems to be better off with a system that neglects this head of damage and thereby systematically underestimates the true harm suffered. Such a conclusion is, however, premature as price and quantity effects are interdependent. Unless this interdependence is not understood and damage is systematically underestimated, even the defendant may be better off with quantity effects being explicitly treated in the analysis.

In contrast to the (rebuttable) presumption on the overcharge, which is to the benefit of the plaintiff, the defendant could also benefit from a (rebuttable) presumption of a quantity effect. If a defendant cannot demonstrate pass-on, but the plaintiff demonstrates a quantity effect, this is direct evidence that part of the overcharge was passed-on and that the overcharge therefore is an overestimation of the true harm suffered from the price effect.

III. DAMAGE QUANTIFICATION IN ABUSIVE CONDUCT CASES

A. Damage Caused by Abusive Behavior and the Counterfactual Scenario

[12] While the overcharge is a likely overestimate of the true price effect, the overcharge alone is likely to underestimate total damage if pass-on occurred.

[13] *See* Maier-Rigaud, *supra* note 7.

To estimate damages resulting from abusive conduct, the actual infringement situation has to be compared to a hypothetical counterfactual situation in the absence of the abuse. The damage is then the difference in the wealth of economic actors affected by the abusive behavior in both scenarios.[14] To calculate the damage caused by an exclusionary abuse, the situation that would have occurred in the market absent the exclusionary abuse has to be assessed in order to calculate what profits competitors would have been able to obtain in the counterfactual scenario and what prices the purchasers would have had to pay. While this is clear from a conceptual point of view, the practical application is often fraught with severe difficulties.

The primary candidate for the counterfactual scenario is the market before the exclusionary conduct took place.[15] In most cases, there will be no comparable geographic or product market that comes close to the market under consideration as the counterfactual would need to exhibit similar concentration, cost structures, and demand conditions as the factual scenario.

As an exclusionary abuse typically unfolds in time and in different phases, a comparison with a unique moment in time only provides an incomplete picture of the effects. It thus needs to be considered how the market would have developed but for the anticompetitive conduct; for example, this is particularly important in markets with network effects where competition is for the market. If the dominant firm prevented a competitor from winning the critical mass of consumers that led to a tipping of the market, the situation prior to the abuse may not be a particularly sensible counterfactual scenario as the other firm would have realized substantial profits in the absence of the abuse in the meantime.

A further conceptual problem consists in establishing what is implied by “but for the exclusionary abuse,” as there are a multitude of possible strategies conforming to competition law that a dominant firm could have followed which are likely to have entailed very different market outcomes. For instance, in case of exclusion through a retroactive rebate, several possibilities, ranging from a linear price to a two-part tariff to an incremental quantity discount, could be appropriate counterfactual pricing schemes, all giving rise to potentially different market outcomes.

In principle, the counterfactual scenario would have to be characterized by an oligopolistic equilibrium in which the dominant firm maximizes profits under the constraint of complying with competition law. In some cases, e.g. in a case of pure bundling, it might be possible to construct such a probable counterfactual scenario by calculating the market outcome and the profits the competitors of the dominant firm would have made absent the bundling, i.e. in case the products had also been sold independently. In other cases of exclusionary abuses, e.g. strategic barriers to entry, the construction of an economically sound counterfactual is likely to be difficult.

[14] In what follows, only the case of exclusionary abuse is considered, as an exploitative abuse is conceptually equivalent to damage caused by a cartel.

[15] Focusing on the market prior to the introduction of the exclusionary strategy may turn out to be problematic as the market structure may have completely changed as a result of the abuse.

A possible solution in these cases could consist of a simulation of the market that may indicate the possible development of the market absent the abusive behavior. To apply simulation techniques, however, the relevant data have to be available to estimate and/or calibrate the model. If these data are lacking, they have to be substituted by reasonable assumptions.

Thus, estimating damage in exclusionary abuse cases often has to rely on a more or less rough estimation of the lost profits of competitors and the damage that accrued to the customers. Here, the conditions of the relevant market have to be considered, including the size and geographic extent of the market, the importance of entry barriers, the type of products traded (homogenous, differentiated, intermediate or final goods), the market development, the degree of innovation, etc.

This shows that the type of abuse plays a critical role in the derivation of the counterfactual and, therefore, also in the precision with which damages can be estimated.

B. Example: Quantification of Damage in Case of an Exclusionary Abuse

Damage estimation in exclusionary abuse cases is generally much more complex than in cartel cases for several reasons. First, exclusionary behavior typically exhibits different phases, some of which will potentially affect economic actors positively and others negatively. An exclusionary abuse has a negative impact on the direct competitors as well as the suppliers of firms that were forced to exit the market, while the customers of the products of the dominant company benefit from the low prices in that phase.[16] Second, a predatory strategy may result in the exit of a competitor, whereas other practices may result in entry being barred.

In what follows, the complexity of damage quantification is illustrated using an example of exclusionary abuse that aims at the market exit, or at least the marginalization of an actual competitor:

Phase One: In phase one of an exclusionary abuse, the profits of competitors and their market shares decline until the competitor(s) leave(s) the market or until the market shares of the competitor(s) stabilize on a comparatively low level. Depending on the type of abusive behavior, the dominant firm may still earn profits, as e.g. with retroactive rebates. It may, however, also realize losses, as in the case of predatory pricing.[17]

The impact for customers of the firms in case of an exclusionary strategy like predatory pricing or margin squeeze is in all likelihood positive. They pay lower prices

[16] This may be one of the reasons there is almost no literature focusing on the calculation of damages in exclusionary abuse cases. A notable exception is the contribution by Chiara Fumagalli, Jorge Padilla, & Michele Polo, *Damages for Exclusionary Practices: A Primer*, in COMPETITION LAW AND THE ENFORCEMENT OF ART. 102, 203-220 (I. Kokkoris & F. Etro eds. 2010). *See also* Maier-Rigaud & Schwalbe, *supra* note 3.

[17] The question is not necessarily whether overall profits are positive or negative but rather whether there is a profit sacrifice that would require at least probabilistic future recoupment to make the strategy profitable, or whether exclusion may be compatible with profit maximization considering only the first phase. Both scenarios are possible and depend on the abuse.

for the products than they would have paid in the absence of the predatory strategy. These effects can propagate and reach also indirect purchasers that would equally benefit from the predatory prices. Different effects on purchasers arise if the abuse leads to an increase in input prices (raising rivals' cost) or a refusal to deal. Here, the cost of competitors rise so that the price level on the downstream market tends to increase and customers pay higher prices than in the absence of the infringement. Repercussions on indirect purchasers are also likely in this case.

Phase Two: In a case where the abuse led to exit, the competitor is not only unable to realize any profits in phase two but may even have to bear sunk costs.[18] In a case where the competitor remains in the market—albeit with lower market shares—it would be able to realize profits in the second phase, but they may be substantially lower than in the absence of the abuse. In both cases, the bulk of the damage to the firm consists of lost profits. The dominant firm, in contrast, has reached its goals in the second phase and is able to reap the benefits of increased market power by setting higher prices and earning higher profits.

The effects of the abuse on the customers in phase two are analogous to those of a cartel as direct and indirect purchasers pay higher prices. In addition, there is also damage in the form of reduced choice. In particular in markets with differentiated products the elimination of competitors reduces the product variety and thereby diminishes consumer welfare. Proving and quantifying such damage is, however, difficult. Suppliers of the dominant company face a lower demand due to the reduced quantities supplied by the dominant firm. This results in harm in the form of lost profits.

Phase Three: Phase three begins when the abusive practice has ceased, typically, at least in follow-on suits, before the cease and desist decision by the competition authority. This phase is, in some sense, the reversal of the first phase, although the damage calculation in this phase is likely to be extremely difficult due to the added complications in the form of behavioral or structural remedies that may have been imposed by the competition authority.

Generally speaking, the third phase will see a return to competitive conditions, implying the entry of new competitors or the re-entry of the firms that exited, or corresponding increases in market shares of the firms that were marginalized. As a result of these developments the profits of the dominant firm decrease irrespective of any potential fine imposed by the competition authority and the profits of competitors would increase. The third phase ends once a situation obtains that comes close to the situation that would have existed but for the infringement.

An important aspect of phase three concerns the remedies that the competition authority may impose. In contrast to cartel cases that typically end with a cease and desist order and the imposition of fines, abusive practices trigger behavioral or structural remedies. As a result, assessing harm in the context of such cases may involve taking into account potential benefits that are due to remedies imposed by the competition authority.

[18] Of course it would be incorrect to add the sunk costs to a calculation of damages based on lost profits. A firm can either claim the sunk costs or the lost profits but not both.

And outside the context of follow-on claims, the abusive practice may have resulted in permanent changes of the market structure that are not impacted by compensatory payments so that the third phase does not lead to an approximation of the situation prior to the infringement. Even if a decision by a competition authority exists, a dominant firm may have been able to build up a reputation of fighting market entry with predatory prices. In such a case entry would not be observed immediately and may eventually occur only after a long time has passed.

A similar problem exists in case of an exclusionary abuse targeting potential competitors that are kept from considering entry. In such cases they are harmed in the form of lost profits that they may have been able to realize after entry. Or this exclusion could have led to entry in another, less profitable market.

In this context it is also important to consider the technology a potential competitor would have used upon entry, i.e. whether it would have deployed a superior, inferior, or identical technology. Without additional evidence that the company could have produced more efficiently, it may be useful to assume that such a competitor would have entered using the same technology, exhibiting a similar efficiency as the dominant undertaking.

In order to estimate the damages that accrued to the different actors in the different phases, a comparison to the counterfactual is necessary. In order to fully utilize all available information, it seems appropriate to consider several realistic counterfactual scenarios that are compatible with the underlying characteristics of the markets in question.

Different scenarios can be generated by employing different factual and hypothetical comparator methods. They can also be generated by varying some of the crucial determinants of the outcome in a simulation model used in the hypothetical comparator approach, which would further increase the robustness of results. As an exclusionary abuse can target the revenues or costs of competitors, it is useful to estimate the change in profits of the competitors through a separate analysis of the development of revenues and costs. Such an approach could facilitate the distinction between changes in profit that are due to the abusive conduct and those that are not.

For this purpose, all those factors that bear no causal relationship with the incriminated behavior have to be controlled for. The extent to which the factors have an impact on the profits follows from the respective multivariate regressions. In principle these econometric methods allow an estimation of the impact of these factors on cost, revenues, and profits and to determine to what extent the changes in profits can be explained by these factors. Depending on the case at hand, however, this may be difficult, so it is of central importance to identify all these factors and to control for them in an econometric analysis. Otherwise, it cannot be excluded that changes in profits are attributed to the abusive conduct although the changes had—at least in part—different causes.

IV. CONCLUSION

This article attempts to shed some more light on two facets that have been treated only perfunctorily by the literature and the policy debate surrounding the green

and white papers, as well as the proposed Directive on actions for damages, despite their importance for successful private enforcement of competition law in the European Union. Using a standard Cournot model, the magnitude of quantity effects was demonstrated relative to price effects that have been the focus of the debate on damages actions. It was argued that the EU debate has not managed to fully emancipate itself from legal categories that derive their meaning exclusively from U.S. law and therefore have (or should have) no particular economic or legal relevance in an EU context.

Section 3 discussed the particular difficulties of quantifying damages in the context of Article 102 TFEU. These difficulties are due to the need to establish an appropriate counterfactual and are further exacerbated by the effects of behavioral or structural remedies. Exclusionary abuses that entail both positive and negative effects, such as tying, that also reduce transaction costs generate the need to net the harm and the gains that typically emerge across time, rendering the quantification of damage in abuse of dominance cases particularly difficult.