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Full compensation and the volume effect: assessing different policy options

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ABSTRACT

According to the Damages Directive victims of infringements of competition law are entitled to full compensation. To achieve this goal overcharges, passing-on, and volume effects should play a role in the calculation of damages (for any purchaser who is not yet the final consumer). Whereas the Damages Directive promotes the passing-on defence for the defendants, it does not regulate volume effects in depth. The computation of these effects requires information on counterfactual prices and quantities. Since this information cannot be observed, the size of the volume effect tends to be uncertain. This paper discusses policy-options that aspire to bring compensation closer to full compensation, given uncertainty about the size of the volume effect. Based on the maximin-principle, a principle for decision-making under uncertainty, not allowing a passing-on defence appears to be an attractive option since this may lead to the minimization of the maximum gap between actual and full compensation.

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KEYWORDS Damages directive; cartel overcharges; passing-on; volume effect; full compensation

1. Introduction

In discussions on the quantification of harm caused by infringements of competition law, one generally makes a distinction between the overcharge, the passing-on effect, the volume effect and the deadweight loss.¹ Cartels tend to lead to an increase in the price that direct purchasers

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¹See EU policy documents: RBB Economics, Study on the Passing-on of Overcharges (2016) <<https://ec.europa.eu/competition/publications/reports/KD0216916ENN.pdf>>. European Commission (2019), Guidelines for national courts on how to estimate the share of overcharge which was passed on to the indirect purchaser 2019/C 267/07, OJEU C267.

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have to pay for the products bought from the cartel. The overcharge refers to the extra costs paid by the direct purchaser. The direct purchaser may pass-on part of the price increase to indirect purchasers / consumers. This, in turn, leads to the volume-effect. An increase in the price that indirect purchasers have to pay will generally lead to a decrease in the quantity sold by the direct purchasers. Hence, the direct purchasers will lose the profit they would have made on each unit sold in the alternative situation.

In practice, there are “many” judgments regarding the overcharge, “some” judgments regarding passing-on, and “hardly any” judgments where the volume effect² plays a role.³ As a matter of fact, pass-on is predominantly discussed only to the extent that a passing-on defence is excluded and the necessity to quantify this damage component is, hence, avoided.⁴ Take the European trucks cartel in which for 14 years the major truck producers MAN, Volvo/Renault, Daimler, Iveco, DAF and Scania colluded on truck pricing⁵: The most dominant jurisdictions for damages litigation are Germany,⁶ the Netherlands,⁷ Spain⁸ and the United Kingdom.⁹ Also, for instance, in Italy, Belgium and Portugal the first judgments quantifying the cartel overcharge in the trucks cartel were passed quite recently. In terms of damage quantification in the trucks cartel many of the procedures so far only deal with initial questions of whether

²This occurs in the form of lost profit – for the remainder of the paper we will stick to the more economic term volume effect.

³There is, furthermore, no European case in which the deadweight loss was assessed. There is to the best of our knowledge only one Chilean case, in which, a pharmacy cartel was held to pay not only compensation for the overcharge but also for the deadweight loss, see C-1940-2013, judgment of 17.12.2019, 10° Juzgado Civil de Santiago.

⁴Note, however, that in a French dairy products case the Court of Appeal recently found the pass-on rate was partial rather than full (the court applied three different rates), see Paris Court of Appeals ruling of November 24, 2021 (no. 20/04265). In France pass-on is more readily accepted (under old law, under which the burden of proof to show that there was no pass-on rested with the claimants). This can lead to a denial of compensation, see, for example, *Vania v Carrefour*, Paris Court of Appeal, 5 January 2022 (no. 19/22293) and *JJSBF v Carrefour*, Paris Court of Appeal, 14 April 2021 (no. 19/19448). For the latest developments regarding private enforcement of competition law in France see Mélanie Thill-Tayara and Marion Provost, France: practical insights into private antitrust litigation, 24 June 2022, Global Competition Review.

⁵European Commission, CASE AT.39824 – Trucks.

⁶For trucks: BGH, judgment of 23.9.2020 – KZR 35/19 – “LKW I”; KZR 19/20 and KZR 20/20 (both trucks) oral hearings on 13.4.2021.

⁷For trucks: Rb Amsterdam judgment of 15.5.2019, ECLI: NL:RBAMS:2019:3574; Rb Amsterdam judgment of 12.5.2021, ECLI:NL:RBAMS:2021:2391.

⁸For trucks: Marcos <https://almacenderecho.org/estadisticas-sobre-acciones-de-danos-causados-por-el-cartel-de-fabricantes-de-camiones>; <https://almacenderecho.org/jurisprudencia-menor-sobre-los-danos-causados-por-el-cartel-de-camiones>.

⁹For trucks: UK Competition Appeals Tribunal, Trucks cartel, Cases No: 1284/5/7/18 and 1290-1295/5/7/18 (T), 4.3.2020 and recently 1284/5/7/18 (T) *Royal Mail Group Limited v DAF Trucks Limited and Others*, same as 1290/5/7/18 (T) *BT Group PLC and Others v DAF Trucks Limited and Others* (2023 CAT 6).

any harm can be excluded upfront or if its existence is established. The lower courts in Italy,¹⁰ in Belgium,¹¹ in Portugal¹² and in Spain put actual numbers for the amount to be compensated.¹³ The judges restrict their judgments to the overcharge, in some cases after excluding pass-on.

From the point of view of any claimant who is not the final one in the supply chain, apart from claiming the overcharge, claiming the volume effect is a relevant component. This can be supported from an economics point of view. These are the two essential damage heads: the overcharge (depending on the level within a long supply chain, it should be more accurately called “passed-on overcharge”) and the volume effect. This leads to a number of questions: what is the problem if there appear to be “hardly any” cases where the volume effect plays a role?, what are the causes of the problem?, and how can it be solved? The current court cases widely apply the law as it stood prior to the Damages Directive,¹⁴ which is why we need to ask the question of whether the changes introduced by the Directive can be expected to change the status quo towards bringing it more in line with true full compensation.

2. Full-compensation and the quantification of harm

The central concepts may be conveniently explained using an example, depicted in [Figure 1](#), where a cartel sells products to a direct purchaser who sells products to the indirect purchasers who are final consumers. [Figure 1](#) also provides a starting-point for the quantification of harm caused by infringements of competition law.¹⁵ Cartel damage is typically split between the overcharge (A), the passing-on effect (B), the volume effect (C) and the deadweight loss (D).

¹⁰Tribunale di Napoli judgment of 6.7.2021 – No. 6319/2021: resulting in 15%.

¹¹Ondernemingsrechtbank Gent, Afdeling Kortrijk judgment of 29.4.2022 – A/18/02226: resulting in 7.5%.

¹²See CDC, ‘Trucks cartel: Portuguese competition court grants a 15.4% compensation and applies its national law in line with recent EU case law’, Lexology, 23 January 2023.

¹³Also in Germany there are a few examples of quantification: LG Dortmund put a number but in a case related to the railway cartel: LG Dortmund judgment of 30.9.2020–8 O 115/14, juris (15%, where a liquidated damages clause played a major role); OLG Celle judgment of 12.08.2021–13 U 120/16 in the chip board cartel (12%).

¹⁴See Directive 2014/104/EU of the European Parliament and of the Council of 26 November 2014 on certain rules governing actions for damages under national laws for infringements of the competition law provisions of the Member States and of the European Union (Damages Directive), OJ L 349, 5.12.2014, p. 1–19.

¹⁵Presentation based on: RBB Economics, Study on the Passing-on of Overcharges (2016), p. 10. <<https://ec.europa.eu/competition/publications/reports/KD0216916ENN.pdf>>. A similar figure can be found in the 2019 Guidelines.

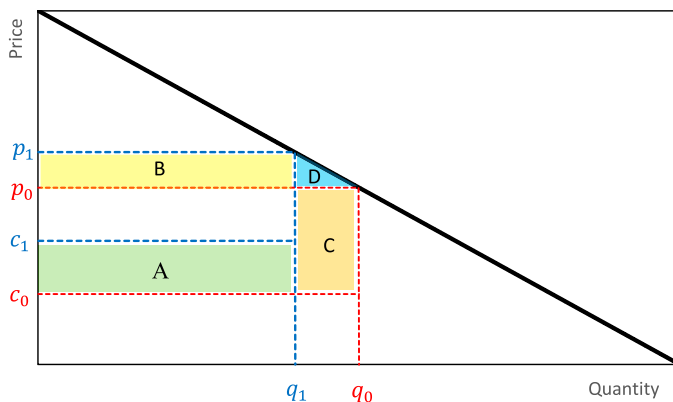


Figure 1. Quantification of harm.

- (A) A cartel may demand a higher price c_1 than would have prevailed in the absence of a cartel, the *counterfactual price* c_0 . This price increase implies a cost increase for the direct purchaser. The *overcharge* reflects the extra costs paid by the direct purchaser. Area A in Figure 1 represents the overcharge. The overcharge may be computed as: $(c_1 - c_0) \times q_1$.
- (B) The overcharge may be an overestimation of the harm suffered by the direct purchaser. This is because the direct purchaser may pass-on part of the cost increase to the indirect purchasers. This leads to an increase in the price paid by the indirect purchasers. The price increase is the difference between the actual price p_1 and the price that would have prevailed otherwise, i.e. the *counterfactual price* p_0 . Area B in Figure 1 represents the *passing-on effect*. This effect may be computed as: $(p_1 - p_0) \times q_1$.
- (C) If there is passing-on, there will also be a *volume effect* (unless demand is perfectly inelastic or, equally unrealistic, unless there were no profit margins to be earned in the but-for scenario. Given both situations in which there would not be such a thing as a volume effect are highly exceptional, in the continuation of this paper we will follow the line that when there is an overcharge, there will be pass-on and there will be a volume effect.) An increase in the price will generally lead to a decrease in the quantity. This decrease is equal to the difference between the actual quantity q_1 and the quantity that would otherwise have been sold, the *counterfactual quantity* q_0 . Consequently, the direct purchaser will lose profits on those sales. The profit margin in the counterfactual

situation is $(p_0 - c_0)$. Area C in [Figure 1](#) represents the volume effect. This effect can be computed as: $(p_0 - c_0) \times (q_0 - q_1)$.

- (D) Finally, if there is a volume effect there will also be a *deadweight loss*: the welfare loss suffered by the consumers that would have bought the product at the price level before the price increase. Area D in [Figure 1](#) represents the deadweight loss. The deadweight loss can be computed as: $\frac{1}{2} \times (q_0 - q_1) \times (p_1 - p_0)$.

There is a clear relation between the overcharge, the passing-on effect, the volume effect and the deadweight loss. If, and only if, there is an overcharge there can be passing-on. Confronted with a price increase under basically all market conditions the typical reaction of any company would be some degree of pass-on (unless only one firm is affected by the overcharge – then it cannot pass-on anything as other firms would reap its profits). If there is passing-on there will be a volume effect and a deadweight loss (unless demand is perfectly inelastic).

Both the direct purchaser and the consumers will be harmed by a price increase by the cartel. The harm suffered by the direct purchaser is equal to $A - B + C$. That is: the direct purchaser pays the overcharge (A), passes-on part of the overcharge to its consumers (B), and loses some profit due to a decrease in the quantity sold (C). The harm suffered by consumers is equal to $B + D$. That is: the consumers pay a higher price for the products they still buy after the price-increase (B) and they suffer a deadweight loss (D).

The Damages Directive specifies in art. 3.1 that “any natural or legal person who has suffered harm caused by an infringement of competition law is able to claim and to obtain full compensation for that harm”. This implies that the direct purchaser should receive compensation equal to $A - B + C$, and that consumers should receive compensation equal to $B + D$. The quantification of all these components is crucial in order to achieve full compensation.

The quantification of harm is complicated because information is required on prices and quantities in the counterfactual situation, that is the situation that would have prevailed in the absence of a cartel. The counterfactual situation cannot be observed, but must be reconstructed. An extra complication is that the party that can be assumed to be best informed about the counterfactual price or quantity is not necessarily the party that has an incentive to reveal this information. This is shown in [Table 1](#). In this table, c_0 , p_0 , and q_0 refer to the counterfactual situation.

Starting with the actual situation, p_1 , q_1 and c_1 are in principle observable. In order to claim the overcharge, information on c_0 is required. According to the Damages Directive, the burden of proof is with the claimant. The defendant is, however, probably best informed on c_0 . For a passing-on defense, information on p_0 is required. Given the information from the previous step, information on the passing-on rate would be helpful order to calculate p_0 . According to the Damages Directive, the burden of proof is with the defendant. The claimant is, however, probably best informed on p_0 . In order to claim the volume effect, information on q_0 is required. According to the Damages Directive, the burden of proof is with the claimant. Given the information from the previous step, this implies that information is required on how the quantity responds to a change in the price. This information is incorporated in the demand curve. Providing proof of the counterfactual quantity will generally be challenging for any of the litigants.

3. Problem analysis

There are manifold examples of quantifications of overcharges, in particular thanks to the Spanish jurisprudence in the trucks cartel¹⁶ but also in some other cases.¹⁷ This is less so with a view to the passing-on effect which the courts tend to avoid by not granting the passing-on defence.¹⁸ As a consequence the volume effect is not broached. We need to point out here that in the cases we currently see in the courts (e.g. the trucks cartel cases) national law dating back to before the Damages Directive was applied. Therefore, the allocation of the burden of proof can still be different than under the new European regime. This is notably the case in Germany but also in Spain where under old

¹⁶Marcos <https://almacenederecho.org/jurisprudencia-menor-sobre-los-danos-causados-por-el-cartel-de-camiones>.

¹⁷For Germany, Rengier, Lukas, Kartellschadensersatz in Deutschland – die ersten 15 Jahre in Zahlen und Lehren für die Zukunft, WuW 2018, 613ff; Klumpe, Gerhard/Thiede, Thomas, Ergänzende Überlegungen zu Lukas Rengier, Kartellschadensersatz in Deutschland, WuW 2018, 613, NZKart 7 (2019), 136ff; see the yearly overview, eg for 2021: Jean-François Laborde, Cartel damages actions in Europe: How courts have assessed cartel overcharges (2021 ed.), Legal Practices, Concurrences N° 3-2021, pp. 232-242.

¹⁸Due to the rational apathy of lower levels in the supply chain, see eg LG Dortmund judgment of 27.6.2018–8 O 13/17, BeckRS 2018, 13951, paras 122; LG Frankfurt am Main judgment of 30.3.2016, 2 O 6 O 464/14, juris, para 160; OLG München judgment of 8.3.2018 – U 3497/16 Kart, NZKart 2018, 230, para 87, similarly LG Stuttgart judgment of 30.4.2018–45 O 1/17, juris, para 64; BGH judgment of 28.6.2011 – KZR 75/10, BGHZ 190, 145, para 75; LG Kiel judgment of 18.4.2019 – 6 O 108/18, NZKart 2019, 435; Rechtbank Gelderland judgment of 29.3.2017, ECLI:NL:RBGEL:2017:1724, paras 4.15; likewise not granted in 1284/5/7/18 (T) Royal Mail Group Limited v DAF Trucks Limited and Others, same as 1290/5/7/18 (T) BT Group PLC and Others v DAF Trucks Limited and Others (2023 CAT 6).

Table 1. Availability of and incentives to reveal Information, and the allocation of the burden of proof.

	Incentive	Availability	Burden of proof and possible facilitations of proof As stipulated in the Damages Directive
A. Overcharge $(c_1 - c_0) \times q_1$	The <i>claimant</i> has an incentive to provide evidence that supports claiming the overcharge. Providing evidence that indicates a lower value of c_0 would imply a higher level of the overcharge.	The <i>defendant</i> is probably best informed about the increase in c caused by the cartel because the increase is a consequence of cartel behaviour. The claimant may also have information on an increase in c since the claimant pays the increased price.	According to Directive burden of proof with claimant; (rebuttable) presumption of harm (Art. 17 [2]) as to existence of overcharge
B. Passing-on $(p_1 - p_0) \times q_1$	The <i>defendant</i> has an incentive to provide evidence that supports the passing-on defense. Providing evidence that indicates a lower value of p_0 leads to an increase in pass-on. By providing evidence of a low value of p_0 the defendant on the one-hand supports the passing-on defense, but on the other hand provides evidence that the claimant may use in claiming the volume effect. Indirect purchasers have an incentive to prove the amount of the "passed-on overcharge", which is equal to the amount the defendant can deduct via the passing-on defense.	The <i>claimant</i> has information on the increase in p in response to an increase in c since the increase in p is a consequence of the claimant's behaviour. The indirect purchaser is in a similar situation to the direct purchaser (called claimant in this table) with a view to the overcharge. The direct purchaser has the best information about the price increase – about how much he increased p in response to an increase in c . The indirect purchaser may also have some information on an increase in c . Also the carteliser may have some information since his price increase set this chain in motion.	Burden of proof with defendant (Art. 13) In case of an indirect purchaser claim, burden of proof with that claimant (Art. 14 [1]): (rebuttable) presumption of pass-on as regards its existence as such (Art. 14 [2]): as the second condition the existence of a cartel overcharge at the beginning of the supply chain is required – this proof can be facilitated by an interaction with the presumption in Art. 17 (2)
C. Volume effect $(p_0 - c_0) \times (q_0 - q_1)$	The <i>claimant</i> has an incentive to provide evidence that supports claiming the volume effect. Providing evidence that indicates a	The <i>claimant</i> can be expected to have some information regarding the market where his products are sold. What is the quantity that would have been sold if	Rests with the claimant (Art. 12 [3])

(Continued)

Table 1. Continued.

		Burden of proof and possible facilitations of proof As stipulated in the Damages Directive
Incentive	Availability	
higher value of q_0 leads to an increase in the volume effect (for given values of p_0 and c_0 , i.e. if the profit margin is constant). Providing evidence that suggests a relatively elastic demand (implying a price increase from p_0 to p_1 leads to a relatively large reduction in the quantity from q_0 to q_1).	the price had been equal to the counterfactual price? Information on the price elasticity of demand would be required. The <i>defendant</i> has information regarding the increase in c caused by the cartel. (See above) The <i>claimant</i> has information on the increase in p in response to an increase in c . (See above) The computation of the volume effect is especially challenging since information on three counterfactuals is required.	

law a rule prevails according to which the defendant when advancing the passing-on defence, has to show that there was no such thing as a volume effect that upset this effect.¹⁹ This disadvantageous allocation of the burden of proof from the defendants' point of view may be another reason hampering their successful passing-on defence.²⁰ However, this cannot be clearly extracted from the case-law to this day because other

¹⁹Germany in 2011 with BGH judgment of 28 June 2011 – KZR 75/10, BGHZ 190, 145; as evidenced by OLG Celle judgment of 12 August 2021–13 U 120/16, openJur, para 301 according to which the defendant omitted to do so – to some extent this rule seems to have been modified by BGH judgment of 23 September 2020 – KZR 4/19. According to one interpretation the volume effect is now linked to the question of whether adjustment of profit as to pass-on is unreasonably favouring the defendant rather than being part of his burden of proof, see Huttenlauch/Dengler/Voges (2021), *Jüngere Entwicklungen im Kartellschadenersatzrecht* (Teil 1), 202, 207; according to Weitbrecht (2021), 'Die Passing-on Defense nach Schienenkartell V' [2021] WuW 86, 88 the requirement was dropped altogether; Spain in 2013 with the TS judgment of 7 November 2013, ECLI:ES:TS:2013:5819. This mechanism was actually taken up again by Cento Veljanovski, *Cartel Damages. Principles, Measurement, and Economics* (Oxford University Press 2020) 347 to suggest a system in which claiming the volume effect is facilitated from the claimants' point of view. And remember that in France the claimant needed to show that there was no such thing as pass-on, as referred to in footnote 4.

²⁰Furthermore, European competition law prior to enacting the Directive and its Articles 5 and following did not have wide disclosure rules. The enhanced disclosure regime took effect in Member States on the day of the enactment of the Directive, also for cases that are litigated according to old substantive law.

reasons for not granting the passing-on defence prevail (such as rational apathy which would cause no lower level in the supply chain to sue). A noteworthy exception in which both, actual values for pass-on and the volume effect, were established by the court is the Danish case “Cheminova”:²¹ after establishing a pass-on of 50%, the volume effect was quantified at 20% of the overcharge. An important argument when arriving at these numbers was the fact that the pesticides market was a market characterized by monopolistic competition.²² As a matter of fact the lack of some of the crucial information was mentioned in the proceedings, together with the reason why the pragmatic quantification proposals by the European Commission were followed.²³ There are, furthermore, some judgments which refer to the theoretical necessity to consider the volume effect without quantifying it for the case at hand.²⁴

As explained before, if there is passing-on there will also be a volume effect. Hence, in cases with a successful passing-on defence one would also expect damages claims based on the volume effect. But, apparently, this hardly ever happens. It appears to be difficult to claim compensation for harm caused by the volume effect. This is problematic, because this may lead to under-compensation of the direct purchaser. If the direct purchaser effectively claims the overcharge and the seller effectively brings a passing-on defence, but the direct purchaser is unable to claim the volume effect, then the direct purchaser receives less than full-compensation. Also, but that is not the focus of this paper, the deterrence level may be negatively impacted.

With the Damages Directive the burden of proof for the volume effect shifted to the claimant (which was previously not necessarily the case in the context of the passing-on defence as the German and the Spanish examples show). Hence, according to current law the claimant side is burdened with the quantification. And the challenges discussed below play out to the claimants’ detriment. What the Damages Directive did do, however, is facilitate the passing-on defence (and also indirect

²¹ Judgment of the Danish Maritime and Commercial Court Søg og Handelsretten of 15 January 2015, *Cheminova A/S vs Akzo Nobel Functional Chemicals BV and others*, SH2015.U-0004-07.

²² See judgment SH2015.U-0004-07, pp. 82, 42.

²³ See judgment SH2015.U-0004-07, p. 42 with reference to European Commission, 2013, Practical Guide, 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, par. 178 og 191 and p. 82.

²⁴ Germany in 2011 with BGH judgment of 28 June 2011 – KZR 75/10, BGHZ 190, 145; Spain in 2013 with the TS judgment of 7 November 2013, ECLI:ES:TS:2013:5819; in Hungary Metropolitan Court of Appeal, 5 December 2019, 20.Gf.40.302/2019/5-I; There is also a consideration in the ongoing proceeding of Rechtbank Rotterdam judgment of 26.9.2018, ECLI: NL:RBROT:2018:8001, paras 7.22, in particular as of paras 7.36ff; *Sainsbury’s Supermarkets Ltd v MasterCard Inc* [2016] CAT 11 [434] & [455].

purchaser claims by way of the pass-on presumption).²⁵ Let us be very clear: If the Directive has, therefore, increased the chances that pass-on will be subtracted, it is contrary to the goal of full compensation not to give claimants a feasible mechanism to claim the volume effect. After all it might be the only damage component remaining, for instance if pass-on is full. It is worse for the claimants to receive $A-B$ rather than A . The current court practice is interesting in this regard: Judges avoid dealing with pass-on. By ruling out pass-on they seem to avoid having to assess the volume effect without risking to overly disadvantage the claimant.

A partial explanation as to the why there are no cases about the volume effect is the fact that the passing-on defence is in essence denied in European courts. One can speculate if without the prospect of the subtraction of pass-on, claimants lack incentives to sue for the volume effect.²⁶ Apart from explanations found in how procedural law is set up, not suing for volume effects can clearly be traced back to a quantification challenge: The reason why it may be difficult to claim a loss caused by the volume effect, probably originates in the fact that a relatively large amount of information on counterfactuals is required, i.e. counterfactual non-cartelized price c_0 , counterfactual direct purchaser price p_0 , and counterfactual quantity q_0 . Without information on these counterfactuals, it is impossible to quantify the volume effect. To a large part of this information no party has easy access.²⁷

4. The economics of the volume effect

As indicated before, we observe “many” judgments regarding the overcharge A , “some” judgments regarding passing-on B , and “hardly any” judgments where the volume effect C plays a role. In other words, the *de facto* compensation received by a direct purchaser will in “many” cases be equal to A ,²⁸ in “some” cases equal to $A - B$ and in “hardly

²⁵Franziska Weber, *Der Kartellschaden – eine rechtsvergleichende und rechtsökonomische Untersuchung unter besonderer Berücksichtigung der Mengeneffekte entlang einer Kartellabsatzkette* (Mohr Siebeck 2021) 217.

²⁶In theory claimants could provide the court with the whole calculation of “ $A-B+C$ ” if they had a true interest in the sum rather than A . In jurisdictions like Germany and Spain according to old law claimants should in principle profit from the defendant having to prove the lack of volume effects to successfully bring a passing-on defence.

²⁷As indicated in Table 1, there is only a partial overlap with the information needed to calculate pass-on. See also European Commission, Guidelines 2019/C 267/07, para 137.

²⁸As a consequence of uncertainties and costs involved in civil litigation, in practice the compensation received by the claimant may be smaller than A . Cf. Peter van Wijck and Franziska Weber, ‘The Abstract Presumption of Harm in the Damages Directive: Overconcern of Overcompensation’ (2021) 18 European Competition Journal 204–227.

any” cases equal to $A - B + C$. Full-compensation of the direct purchaser would imply that the direct purchaser receives a compensation equal to $A - B + C$. If passing-on takes place, there will also be a volume effect. In light of the current impossibility of claiming C accurately and the court practices that followed from it, it becomes crucial if A or $A - B$ is “closer to” $A - B + C$. If it is too complicated (or impossible) for the direct purchaser to claim C , would it be better if a passing-on defence is possible or not? The answer clearly depends on the ratio of C and B . In the following we seek to give guidance about the conditions under which A or $A - B$ is closer to $A - B + C$ despite not knowing C ’s exact value. This is a second-best approach.

Figure 2 illustrates the crucial importance of the ratio between B and C for the exercise at hand. The length of the arrows represents the size of A , B and C . Assuming a passing-on rate of 50%, the length of B is half the length of A (i.e. $B = 0.5 \times A$). Figure 2(a) shows an example with relatively small volume effect and Figure 2(b) shows an example with a relatively large volume effect.²⁹ More specifically, in Figure 2(a) the length of C is less than half the length of B (i.e. $C < 0.5 \times B$), and in Figure 2(b) the length of C is more than half the length of B (i.e. $C > 0.5 \times B$). In Figure 2(a) $A - B$ is “closer to” $A - B + C$ than A . In such a setting, it would be better that a passing-on defence is allowed even if claiming the volume effect is impossible. Allowing a passing-on defence would lead to under-compensation since $A - B < A - B + C$, but the result would be closer to full-compensation than obtaining the full amount of the overcharge A . In Figure 2(b) A is “closer to” $A - B + C$ than $A - B$. In such a setting, it would be better that a passing-on defence is not allowed if claiming the volume effect is impossible. Not allowing a passing-on defence would lead to overcompensation, since $A > A - B + C$, but the result would be closer to full-compensation than the result that would be obtained if a passing-on defence was allowed (the result of $A - B$).

The examples illustrate that it is important to consider the relation between passing-on and the volume effect. This relation depends on a number of factors, i.a. the shape of the demand curve.

Elaborating on Figure 1, the relation between passing-on and the volume effect can be further illustrated using a numerical example. Specifically, we consider a linear demand function given by

²⁹The example in Figure 2(a) shows $B = 0.5 \times A$ (i.e. a passing-on rate of 50%) and $0.5 \times B < C < B$. The example in Figure 2(b) shows $B = 0.5 \times A$ and $0 < C < 0.5 \times B$. Note that $A < A - B + C$ if $C > B$.

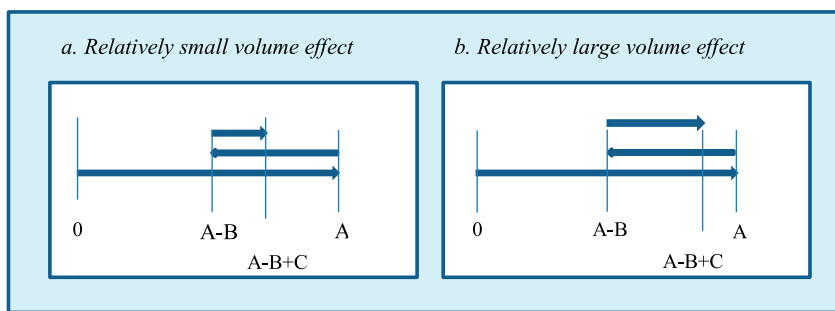


Figure 2. Relatively small and large volume effects. A. Relatively small volume effect. B. Relatively large volume effect.

$p = 10 - q$.³⁰ Figures 3(a and b) illustrate the implications of an increase in the price paid by the direct buyer from $c_0 = 1$ to $c_1 = 2$ and a passing-on rate of 50% (i.e. $\Delta c = 1$ and $\Delta p = 0.5$).³¹ Later, different passing-on rates will be considered.

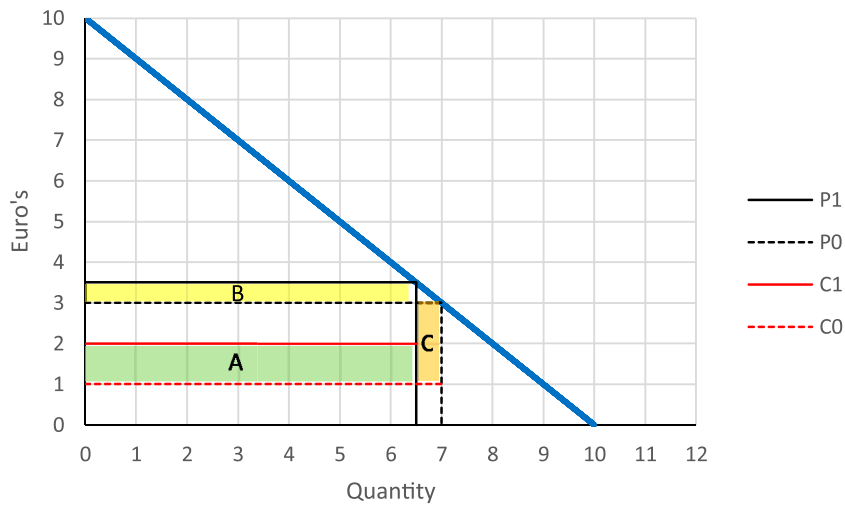
Figure 3(a) shows an example where the counterfactual price charged by the direct purchaser is equal to 3 ($p_0 = 3$) and the counterfactual quantity is 7 ($q_0 = 7$). Here, the increase in c implies $C/B = 0.31$. This corresponds to the situation shown in Figure 2(a) ($C < 0.5 \times B$). Figure 3(b) shows an example with $p_0 = 5$ and $q_0 = 5$. Here, the increase in c implies $C/B = 0.89$. This corresponds to the situation shown in Figure 2 (b) ($C > 0.5 \times B$). These examples illustrate how the ratio of the volume effect and the pass-on depend on the counterfactual situation.

Comparing Figures 3(a and b), we may observe that the consequences of an increase in the prices paid by the direct purchaser, given the passing-on rate, depend on the counterfactual situation.³² A larger value of the counterfactual quantity, leads to a larger value of the overcharge A and, given the passing-on rate of 50%, to a larger value of the

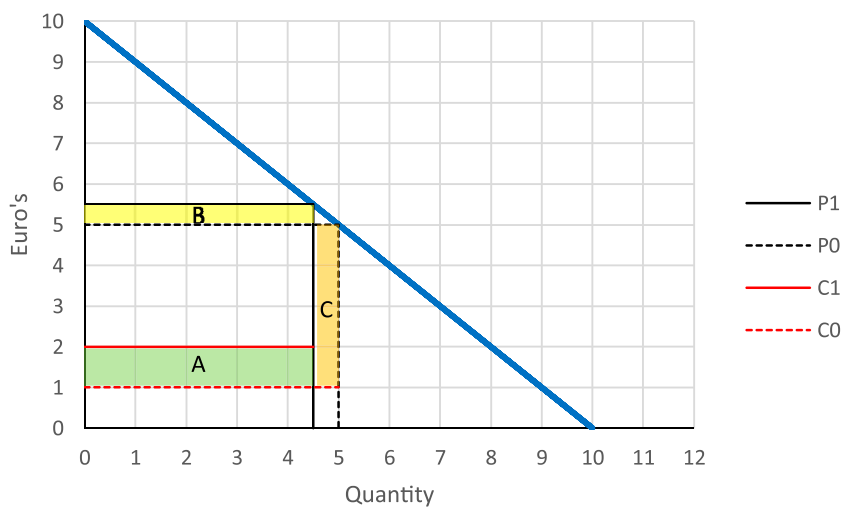
³⁰We did the same exercise on the basis of a constant elasticity demand curve. Since that did not lead to additional insights, we did not include this in the paper.

³¹For convenience we take the price increase by the cartel and the passing-on rate as given. Alternatively, the price increase and the passing-on rate can be assumed to follow from profit maximizing behaviour, depending on market conditions. Since we are mainly interested in the relation between the passing-on effect and the volume effect, explicitly modelling the passing-on rate would yield an unnecessary complication. It can, however, easily be seen that the passing-on rate will be 50% if the direct purchaser is a monopolist facing constant marginal costs and a linear demand curve. See: Gunnar Niels, Helen Jenkins, and James Kavanagh, *Economics for Competition Lawyers* (2nd edn, Oxford University Press 2016) 448. More generally, in case of Cournot competition with N identical competitors facing constant marginal costs and a linear demand curve, the passing-on rate will be $1/(N+1)$. See: Adriaan Ten Kate and Gunnar Niels, 'To What Extent are Cost Savings Passed on to Consumers? An Oligopoly Approach' (2005), 20 *European Journal of Law and Economics* 323–337.

³²In Figure 3(a): $A = 6.5$, $B = 3.25$, and $C = 1$, hence $C/B = 0.31$. In Figure 3(b): $A = 4.5$, $B = 2.25$, and $C = 2$, hence $C/B = 0.89$.



a. Relatively small volume effect



b. Relatively large volume effect

Figure 3. (a) Relatively small volume effect. (b) Relatively large volume effect.

passing-on effect B. A larger value of the counterfactual quantity, implies a smaller value of the counterfactual price and a smaller value of the counterfactual margin. Hence, the volume-effect C will be smaller.³³

³³In Figure 3(a) the counterfactual margin is $p_0 - c_0 = 3 - 1 = 2$, the volume reduction is $q_0 - q_1 = 7 - 6.5 = 0.5$. Hence the volume effect is $2 \times 0.5 = 1$. In Figure 3(b) the counterfactual margin is $p_0 - c_0 = 5 - 1 = 4$, the

Consequently, in case of a linear demand curve larger values of q_0 lead to lower values of C/B . We can relate this back to our starting point: If $C < 0.5 \times B$ (Figure 2a) allowing a passing-on defence would be the better option (leading to compensation closer to full compensation). If $C > 0.5 \times B$ (Figure 2b) not allowing a passing-on defence would be the better option in terms of the proximity to full compensation.

In the preceding examples, we assumed a passing-on rate of 50%. We now consider values between 0.1 and 0.7. Figure 4 shows how C/B depends on the counterfactual quantity and the passing-on rate α . The x -axis shows five values of q_0 , y -axis shows C/B . The yellow column corresponds to the situation in Figure 3(a) (the counterfactual quantity is 7 and the passing-on rate is 0.5). Figure 4 shows that an increase in the counterfactual quantity and a decrease in the passing-on rate lead to a decrease in C/B . As mentioned before, for low values of C/B , allowing a passing-on defence would be the better option.

4.1. The relation between passing-on and the volume effect

The previous examples illustrate how the relation between passing-on and the volume effect depends on a number of factors. It is straightforward to construct examples where the volume effect is larger or smaller than the passing-on effect. Along those lines Maier-Rigaud (2014) presents the results of simulations of a Cournot model, leading to the conclusion that B will generally be larger than C but B may be smaller than C .³⁴ Based on theoretical models also Kosicki and Cahill,³⁵ Hellwig,³⁶ and Verboven and Van Dijk³⁷ conclude that the volume effect may or may not be larger than the passing-on effect. Having said that, empirical information appears to be hardly available. An exception

volume reduction is $q_0 - q_1 = 5 - 4.5 = 0.5$. Hence the volume effect is $4 \times 0.5 = 2$. In other words: In Figure 3(a and b) an increase in the price paid by the indirect purchasers leads to the same reduction in the quantity. In the case with a relatively large counterfactual quantity and a relatively small counterfactual price, the counterfactual margin is relatively small. Consequently, the volume effect will be relatively small.

³⁴Maier-Rigaud considers a three-level value chain. In the counterfactual scenario m producers sell their product to n retailers who sell to consumers. There is a homogeneous product. Consumer demand is represented by a linear demand curve and the cartel acts as a monopolist ($m = 1$). See: Frank P. Maier-Rigaud, 'Toward a European Directive on Damages Actions' (2014) 10 Journal of Competition Law and Economics 341–360.

³⁵George Kosicki and Miles B. Cahill, 'Economics of Cost Pass Through and Damages in Indirect Purchaser Antitrust Cases' (2006) 51 The Antitrust Bulletin 599–630.

³⁶Martin Hellwig, 'Private Damages Claims and the Passing-On Defense in Horizontal Price-Fixing Cases – An Economist's Perspective', in Jürgen Basedow (ed), *Private Enforcement of EC Competition Law* (Kluwer Law International 2007).

³⁷Frank Verboven and Theon van Dijk, 'Cartel Damages and the Passing-On Defense' (2009) 57 The Journal of Industrial Economics 457–491.

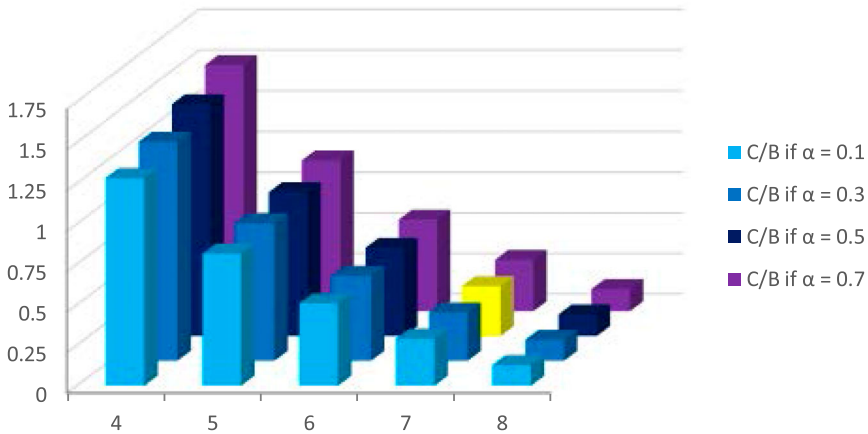


Figure 4. Different counterfactuals and passing-on rates.

is the Cheminova case mentioned before; in this case it was concluded that the volume effect was relatively small: $C = 0.4 \times B$.³⁸ Computing A, B and C in a numerical example is straightforward. In practice, providing proof of C is the most complicated part. The 2019 Guidelines presents a concise discussion of method for the quantification and estimation of volume effects, especially a comparator-based approach and an elasticity approach. The reconstructions of the counterfactual situation remains, however, the most problematic part in the exercise.³⁹ From a policy perspective, the main challenge is how to deal with uncertainty regarding the size of the volume effect.

5. Policy options

Even if it is not yet possible to measure C exactly, theoretically C must exist. After we have explored the relation between B and C, we turn to

³⁸The “seller” in the case, AKZO, participates in a cartel. The “direct buyer” is Cheminova. A is the overcharge paid by Cheminova, B is the part of the overcharge Cheminova passes-on its customers and C is the volume-effect, i.e. Cheminova’s loss in profits caused by the fact that customers buy less. The calculation of the volume effect in Cheminova, crucially depends on two pieces of information. The first is a passing-on rate of 50% (based on theoretical insights) and the second is a price-elasticity of -0.66 (based on market research). A price-elasticity of -0.66 implies $\varepsilon_p = (dq/dp)(p/q) = -0.66$. The findings in Cheminova can be conveniently illustrated using Figure 3. A price-elasticity of -0.66 is consistent with a counterfactual situation where by $p_0 = 4$ and $q_0 = 6$, since that leads to $\varepsilon_p = (dq/dp)(p/q) = -1 \times (4/6) = -0.66$. Starting from this counterfactual, the findings in Cheminova can be easily reconstructed. For instance, a price increase of 1 (so, from $p_0 = 4$ to $p_1 = 5$) would be consistent with an increase in the price demanded by the seller equal to 2. If $c_0 = 2$ and $c_1 = 4$, we find $A = 5 \times (4 - 2) = 10$. $B = 5 \times (5 - 4) = 5$ and $C = (4 - 2) \times (6 - 5) = 2$. Hence, the volume effect would be 40% of the pass-on. (So: $B = 0.5 \times A$, $C = 0.2 \times A$, and $C = 0.4 \times B$).

³⁹Guidelines par. 139–152. The elasticity approach is applied in the Cheminova case.

policy options that might help to bring compensation closer to full compensation. That is, we are looking for policy options that lead to compensation closer to $A - B + C$ (without generating excessive legal costs).⁴⁰ These options play with full or partial amounts of the components A, B and C. They can be seen as policy-changes relative to the current policy in the EU.

5.1. Option 1: current policy

The current policy as introduced by the Damages Directive leads to a sequential procedure in our home jurisdictions Germany and the Netherlands. First, the direct purchaser may claim the overcharge. Next, the seller may opt for a passing-on defence. Finally, the direct purchaser may claim the volume effect. Given that courts disable the second step – possibly at least a partial reason is the anticipation of being unable to carry out the third step – the final step is in essence never reached. The burden of proof after the introduction of the Damages Directive is allocated such that overcharge and volume effect have to be proven by the claimant and pass-on by the defendant.⁴¹ A mitigating factor to each litigant only being able to provide the information actually in his/her hands, is an extended disclosure regime that the Directive introduced. This increases both parties' possibilities to also access/operate with information in the hands of the other party. It provides no solution to information which no litigant or third party has, which is often the case with the information necessary to prove the volume effect. This implies that the issue cannot be solved by thinking of redistributions of the burden of proof. Therefore, rather than fine-tuning the allocation of proof, one needs to lower the requirements for the standard of proof. Lower accuracy may be the result compared to a high standard of proof.⁴² With allowing estimations rather than calculations of harm to assess the volume effect the Directive already takes a step into that direction.⁴³

⁴⁰The payment of damages is, in fact, a redistribution of welfare. The legal costs involved in bringing about the redistribution represents a real welfare loss. Hence, avoiding excessive legal costs is socially beneficial.

⁴¹As said previously in some MS, notably Germany and Spain, the defendant was in the "unlucky" role as to showing with the pass-on defence that there was no such thing as a volume effect. In practice we have never seen cases where this was attempted. Presumably this allocation rule led to a focus on the overcharge in the light of the anticipated inability to fulfil those conditions for the passing-on defence.

⁴²We write "may" as this is not necessarily the case. A high standard of proof may have as a consequence that no action is taken which may lead to a result far from the full compensation principle. A lower standard may lead to some action that, on average may be better than no action.

⁴³See for the general conditions under which the judges' estimation capacity kicks in Art. 17 (1) Directive. For an elaboration of the civil procedural rules on how the volume effect can theoretically be estimated

The following policy options will contain some more radical elements than standard estimations though.

One could say that the current situation is such that the size of the volume effect is basically assumed to be zero, unless the claimant provides proof – or it can be estimated – that the volume effect has a positive size.⁴⁴ Thinking further about the effect of additional facilitations of proof for the volume effect, the following can be said: The Directive does not officially do this⁴⁵ but some Member States with the implementation of the Directive arguably introduced an (abstract) rebuttable presumption of harm that stretches to the volume effect.⁴⁶ However, no Member State gave this presumption a number.⁴⁷ In contrast to the context of the presumption of overcharge where economic studies show that it can actually be 0 in a certain (low) percentage of cases,⁴⁸ the current economic literature on the volume effect conveys a slightly different picture:⁴⁹ as said the situation in which pass-on would not lead to a volume effect is so highly exceptional that it lends itself to the conclusion that in theory there will always be a volume effect. Even for estimations – be it in the context of proving harm or relying on an abstract presumption of harm which then needs to be filled in – the courts need to be provided with sufficient leads to carry out this task. If they are not provided the judges' estimation will need to lead to zero damage payments.⁵⁰ What

in different jurisdictions, see Franziska Weber, 'The Volume Effect in Cartel Cases – a Special Challenge for Damage Quantification?' (2021) 9 *Journal of Antitrust Enforcement* 436–458.

⁴⁴This is a simplified but meaningful look at the consequence of the traditional allocation of the burden of proof in civil litigation combined with major difficulties in proving the damage component in question.

⁴⁵A number of scholars, even though, according to our reading this is not the majority opinion and not supported by the legal interpretation of Art. 17 (2) and accompanying documents, wish to read Art. 17 (2) broader than only being a rebuttable presumption of the overcharge to the benefit of the direct purchaser: Most notably Kersting, see *Kersting*, in: *Kersting/Podszun* (Hrsg.), *Die 9. GWB-Novelle*, 2017, p. 135; *Kersting VersR* 2017, 581, 583; *Marín Castán*, in: *Ruiz Peris* (Hrsg.), *Derecho Europeo de compensación de los daños causados por los cárteles y por los abusos de posición de dominio de acuerdo con la Directiva 2014/104/UE: Proyecto europeo "Training of National Judges in EU Competition Law"*, 2018, p. 330; *Roth*, in: *FFM-KOM, GWB*, 93. Lieferung 4.2019, § 33a, Rn. 103: "Die Kausalitätsvermutung nach Art. 17 Abs. 2 RL 2014/104/EU und § 33 Abs. 2 Satz 1 bezieht sich auf alle Arten von Schäden, die von Kartellabsprachen verursacht sein können"; *van Cleyenbreugel*, in: *Strand/Bastidas Venegas/Iacovides* (Hrsg.), *EU competition litigation: Transposition and first experiences of the new regime*, 2019, S. 206: "the Directive remains silent on the actual harm that is presumed".

⁴⁶Franziska Weber, 'The Volume Effect in Cartel Cases – a Special Challenge for Damage Quantification?' (2021) 9 *Journal of Antitrust Enforcement* 436–458. Roman Inderst and Stefan Thomas, *Schadensersatz bei Kartellverstößen* (2nd edn, Fachmedien Otto Schmidt 2018) 154–155, 455.

⁴⁷Unlike with the case of the overcharge: Hungary and Latvia provide for a rebuttable presumption that cartels cause an overcharge of 10% and Romania provides for a rebuttable presumption that cartels cause an overcharge of 20%.

⁴⁸See Oxera, *Quantifying Antitrust Damages: Towards non-Binding Guidance for Courts* (2009) 91.

⁴⁹Inderst/Thomas, 445–446 and see section "The economics of the volume effect".

⁵⁰This may depend on the Member State in question. Whereas Germany, the Netherlands and Spain seem to be strict, under Belgian law there seems to be generally a higher expectation of coming

may make the claimants' position a bit different from the situation in which they invoke the presumption of harm regarding the overcharge, is the nature of harm resulting from the volume effect. Judges in the Member States may, just as for other scenarios of loss profit whose calculation involves more uncertainties than that of direct damage like the overcharge, be more inclined to estimate the volume effect based on just few leads.⁵¹

Therefore, we simplify that an assumption that $C = 0$, represents current policy.⁵² From economic insights it is clear that the size of the volume effect must be positive in cases with pass-on. We, therefore, observe a tension between the economic and the legal perspective.

What does the current policy mean for the concept of full compensation? Consider the situation where the claimant successfully claims the overcharge, the defendant successfully engages in a passing-on defence, but the claimant is not successful in claiming the overcharge. That is:

- (1) the claimant is able to provide proof of the size of the overcharge A,
- (2) the defendant successfully provides proof of the size of pass-on B,
- (3) and the claimant is unable to provide proof of the size of the volume-effect C (because it is too complicated and/or too expensive).⁵³

In this setting, compensation tends to be equal to $A - B$. Since full-compensation of the direct purchaser would be equal to $A - B + C$ and actual compensation is equal to $A - B$, this implies under compensation equal to C.

Figure 5 provides an illustration of the under compensation for a given size of the overcharge A and a given passing-on rate and different values of the volume effect. Exactly as we did in Figure 2, we consider a case with a

to a positive amount when estimating *ex aequo et bono* based upon an abstract presumption of harm, see D. Simoens, *Buitencontractuele aansprakelijkheid, II, Schade en schadeloosstelling in Beginselen van het Belgisch Privaatrecht*, vol. XI (Antwerpen: Kluwer 1999) 50, nr. 24; H. De Page, *Traité élémentaire de droit civil belge, II* (Brussel: Bruylant 1964) 1062; L. Garzaniti and A. Müller, 'Wat verandert er met de omzetting van de Richtlijn schadevorderingen in België? – Een blik uit de praktijk' (2018) 13 *Competitio* 43–50.

⁵¹See for the options that Member States have developed, Weber (2021), pp. 321 (Germany), 440 (the Netherlands), 543 (Spain).

⁵²Please refer to van Peter van Wijck and Franziska Weber, 'The Abstract Presumption of Harm in the Damages Directive: Overconcern of Overcompensation' (2022) 18 *European Competition Journal* 204–227 for the reasoning why a 0-default leads to undesirable results in the light of economic insights that underline its existence in the abstract. Different to the volume effect, for the case of the overcharge, the past case-law and empirical literature gives an indication about the approximate amount. Therefore, the referenced paper on the overcharge takes a concrete number as a starting point.

⁵³In the 2019 guidelines (par. 155): "the gathering of data and their economic analyses may entail considerable costs for the parties, third parties and the court. These costs may be disproportionate to the amount of damages in question".

passing-on rate of 50% (i.e. $B = 0.5 \times A$) and we look at different levels of the volume effect that may be realized.⁵⁴ Specifically, Figure 5 presents an illustration with $A = 10$, $B = 5$, and $0 < C < 10$. The line $A - B + C$ represents full-compensation. The line $A - B$ represents the compensation in case of a successful passing-on defence. The distance between the line $A - B + C$ and the line $A - B$ represents the under compensation. The red triangle illustrates the under compensation. This demonstrates that the current policy, where C is assumed to be zero, leads to under compensation of the direct purchaser in a setting where a passing-on defence is possible but the claimant is unable to provide proof of the size of the volume-effect.

5.2. Option 2: not allowing a passing-on defence

As discussed, under current policy a passing-on defence may lead to under compensation of the direct purchaser. A possible solution would be: not allowing a passing-on defence. This effectively amounts to the federal US-approach, where a passing-on defence is impossible.⁵⁵ Furthermore, this appears to be consistent with what European courts do. Not allowing a passing-on defence effectively amounts to the situation where only A can be claimed. This approach is consistent with full compensation if and only if $B = C$. In situations where the size of volume-effect in fact is smaller than the size of the passing-on effect, that is if $0 < C < B$, this policy-option necessarily leads to over compensation. This is illustrated by the green triangle in Figure 6. If the size of the volume-effect exceeds the size of the passing-on effect, that is if $C > B$, the policy-options leads to under compensation. This is illustrated by the red triangle in Figure 6.

5.3. Option 3: rebuttable presumption $C = 0.5 \times B$

Option 1 and 2 lead to different problems in terms of over and under compensation of the direct purchaser. Option 1 leads basically always

⁵⁴The assumption of a 50% passing-on rate is made for expositional reasons. A change in the passing-on rate would simply shift the $A-B$ -line upwards or downwards. But it would not affect the line of reasoning. Also for expositional reason, the volume effect on the horizontal axis is confined to the interval $0 < C < 2B$.

⁵⁵*Hanover Shoe Inc. v. United Shoe Machinery Corp.* 392 U.S. 481 (1968), 492–3; paired with this, indirect purchasers are not granted standing, see *Illinois Brick Co. et al. v. Illinois et al.* 431 U.S. 720 (1977). To justify this decision the judges specifically refer to the quantification challenges along the distribution chain, see *Illinois Brick Co. et al. v. Illinois et al.* 431 U.S. 720 (1977), 732–33. In various US American states the situation is different and indirect purchasers do have standing to sue for their damage. However, the passing-on defense is widely not granted. See Joshua P. Davis and Anupama K. Reddy, 'Unintended Consequences of Repealing the Direct Purchaser Rule' (2022) 84 Antitrust Law Journal 341.

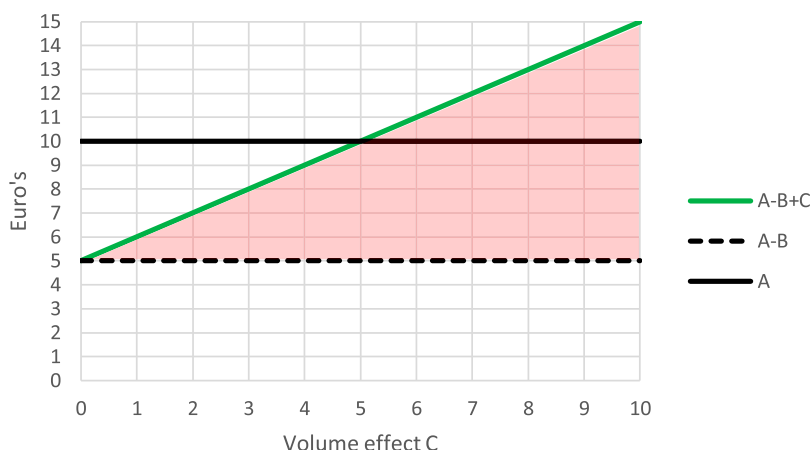


Figure 5. Under compensation as a result of option 1.

to under compensation of the direct purchaser. Option 2 leads to over compensation of the direct purchaser in cases where the volume effect is relatively small. However, it leads to under-compensation when the volume effect is larger than pass-on.

Since (1) and (2) lead to different problems, it seems natural to consider an approach situated between (1) and (2). Option 1, current policy, is consistent with full compensation if and only if $C = 0$. Option 2, not allowing a passing-on defense, is consistent with full compensation if and only if $C = B$. An approach between (1) and (2) would be a policy starting from the assumption that $C = 0.5 \times B$. Specifically, we consider a rebuttable presumption that $C = 0.5 \times B$. In this context, *rebuttable* means that the claimant may try to prove that $C > 0.5 \times B$ or the defendant may try to prove that $C < 0.5 \times B$. Clearly, if providing proof of C is difficult, $C = 0.5 \times B$ will be the default. We do not suggest that the volume effect can typically be expected to be equal to 50% of the pass-on. Rather, it defines a default situated between (1) and (2). And we check under which conditions such a default can be expected to bring compensation closer to full compensation.

Policy option 3 implies that the direct purchaser by default receives compensation equal to $A - B + 0.5 \times B = A - 0.5 \times B$. This is indicated by the blue line in Figure 7. In situations where the size of volume-effect in fact is smaller than half of the size of the passing-on effect, that is if $0 < C < 0.5 \times B$, this policy-option necessarily leads to over compensation. This is illustrated by the green triangle in Figure 7. If the size of the volume-effect exceeds half of the size of the passing-on effect, that is if $C > 0.5 \times B$, the policy-options leads to under compensation.

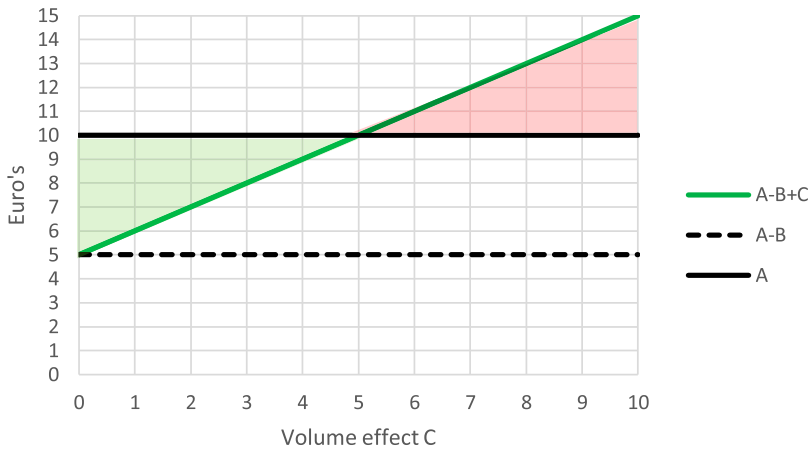


Figure 6. Over and under compensation as a result of option 2.

The essence of policy option 3 is a rebuttable presumption that $C = 0.5 \times B$. The defendant may try to prove that $C < 0.5 \times B$ and the claimant may try to prove that $C > 0.5 \times B$. This requires the calculation of the volume effect. The volume effect is equal to $(p_0 - c_0) \times (q_0 - q_1)$. In principle, q_1 is observable. Furthermore, q_1 and c_0 are known from the computation of the overcharge, and p_0 is known from the computation of the passing-on. Hence, the task is to provide convincing evidence of the counterfactual quantity q_0 . This is the main challenge: how to provide convincing evidence of the quantity q_0 the direct purchaser would have been able to sell if the price had been p_0 rather than p_1 . Since p_0 , p_1 , and q_1 are known, estimating the elasticity of demand would enable the computation of q_0 .⁵⁶

- In order to provide proof that $C < 0.5 \times B$, the defendant would have to show that there is a relatively low decrease in the quantity ($q_0 - q_1$) in response to the increase in the price ($p_1 - p_0$). That is, the defendant would have to show that q_0 is relatively low.⁵⁷
- In order to provide proof that $C > 0.5 \times B$, the claimant would have to show that there is a relatively strong decrease in the quantity ($q_0 - q_1$) in

⁵⁶Cf. Pass-on Guidelines, par. 146-152. Getting a reliable estimate of the price elasticity of demand is not straightforward. One cannot simply regress changes in quantities on changes in prices. Different approaches may be used. One of the options is to use survey data. In practice, confidence intervals tend to be wide. See for instance: Tatiana Andreyeva, Michael W. Long, and Kelly D. Brownell, 'The Impact of Food Prices on Consumption: A Systematic Review of Research on the Price Elasticity of Demand for Food' (2010) 100 *American Journal of Public Health* 216-222.

⁵⁷To be precise: $C < 0.5 \times B$ if $(p_0 - c_0) \times (q_0 - q_1) < 0.5 \times (p_1 - p_0) \times q_1$. Hence $C < 0.5 \times B$ if $q_0 < (1 + 0.5 \times (p_1 - p_0) / (p_0 - c_0)) \times q_1$. In this, $(p_1 - p_0)$ is the increase in the price paid by the indirect purchaser and $(p_0 - c_0)$ is the direct purchaser's profit margin in the counterfactual situation.

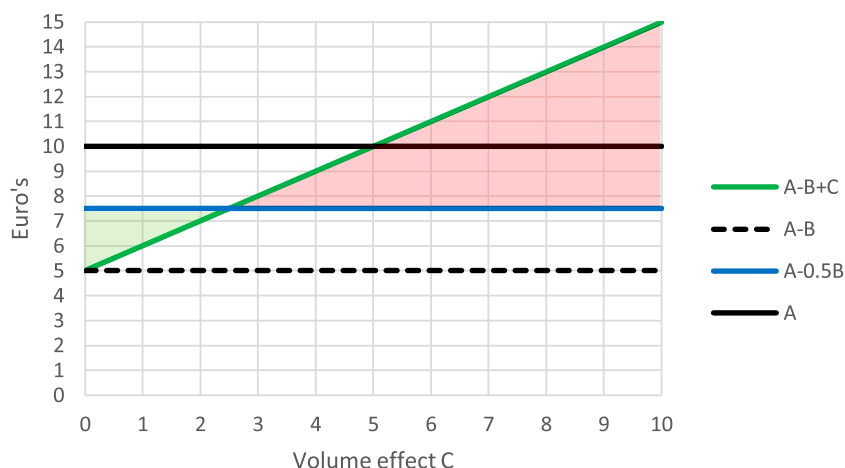


Figure 7. Over and under compensation as a result of option 3.

response to the increase in the price ($p_1 - p_0$). That is, the claimant would have to show that q_0 is relatively high.

We are not the first to suggest a rebuttable presumption to help making claims for the volume effect viable. Maier-Rigaud suggested the consideration of the introduction of a rebuttable presumption that the volume effect is equal to the pass-on, i.e. the rebuttable presumption that $C = B$.⁵⁸ That is, if the defendant provides proof that B is X euro, there is the rebuttable presumption that C is also equal to X euro. To the best of our knowledge a rebuttable presumption that two damage components cancel each other out would be a novum. Different to the (rebuttable) presumption of harm as established by Art. 17 (2) of the Directive which is clearly to the benefit of the claimant, the (rebuttable) presumption suggested here takes a more neutral stance in that it can be either to the benefit of the claimant or to the benefit of the defendant depending on how pass-on and volume effect truly relate to each other.

5.4. Comparing the policy options

Given that full-compensation is the goal, is there anything that can be said about which policy option is preferable? A complicating factor is that the size of the volume-effect will generally be unknown. In such a setting, the selection of a policy option can be approached as decision-

⁵⁸Maier-Rigaud (n 34) 352.

making under uncertainty. With “uncertainty” we refer to the situation where information on the size of the volume effect is absent, basically because it is impossible or too expensive to provide convincing evidence on volume effect. Under conditions of uncertainty, policy options may be selected on the basis of appropriate decision principles, such as the “maximin principle”.⁵⁹ In general terms, the idea is to determine the worst possible outcomes of different policy options and select the policy option that makes the worst outcome as good as possible. Since, or as long as, we do not know the size of the volume effect, it is impossible to get compensation in full compliance with the principle of full compensation. But what we can do, is avoid unnecessary large deviations from full compensation.

Table 2 presents the gap between actual and full compensation for the three policy options under different conditions ($0 < C < \frac{1}{2}B$, $\frac{1}{2}B < C < B$, and $B < C < 2B$).

If it can be assumed that the size of the volume effect will generally be smaller than the size of the pass-on, policy option 3 would be better than policy options 1 and 2, since the maximum gap between actual and full compensation will be maximum $\frac{1}{2}B$ rather than B .

If the size of the volume effect may be larger than the size of the pass-on, policy option 2 would be better, since this policy option would minimize the maximum gap between actual and full compensation. However, if the claimant would be able to prove that the volume effect is large, option 3 may result in a better outcome.

A caveat on the use of maximin principle is in place. The “maximin principle” is one of the principles that may be used for decision-making under uncertainty. By focusing exclusively on the worst possible outcome that may result from selected policy options, the principle fits a rather pessimistic perspective. Alternative principles, such as “minimax regret” or “Hurwicz alpha”, may be used.⁶⁰ In case of “minimax regret” for each state of the world first determine what the best policy is and next compute the regret that will result in case another policy option

⁵⁹An early formulation of the maximin principle can be found in R. Duncan Luce and Howard Raiffa, *Games and Decisions* (Wiley 1957) 278: “each act is appraised by looking at the worst state for that act, and the ‘optimal choice’ is the one with the best worst state.” An example of a paper discussing principles for decision-making under uncertainty and an application to the selection of policy options is Geoffrey M. Heal and Antony Millner, ‘Uncertainty and Decision in Climate Change Economics’ (2014) 8 *Review of Environmental Economics and Policy* 120–137.

⁶⁰See for instance Heal and Millner (2014). An early formulation of “minimax regret” is Loomes, Graham and Robert Sugden, ‘Regret Theory: An Alternative Theory of Rational Choice Under Uncertainty’ (1982) 92 *The Economic Journal* 805–824. Hurwicz alpha is presented in: L. Hurwicz, *Optimality Criteria for Decision Making Under Ignorance*, Cowles Commission Discussion Paper, Statistics, No. 370, 1951.

Table 2. Gap between actual and full compensation.

	$0 < C < \frac{1}{2}B$	$\frac{1}{2}B < C < B$	$B < C < 2B$
Option 1	Under compensation C Max $\frac{1}{2}B$ (if $C = \frac{1}{2}B$)	Under compensation C Max B (if $C = B$)	Under compensation C Max $2B$ (if $C = 2B$)
Option 2	Over compensation $B - C$ Max B (if $C = 0$)	Over compensation $B - C$ Max $\frac{1}{2}B$ (if $C = \frac{1}{2}B$)	Under compensation $C - B$ Max B (if $C = 2B$)
Option 3	Over compensation $\frac{1}{2}B - C$ Max $\frac{1}{2}B$ (if $C = 0$)	Over compensation $C - \frac{1}{2}B$ Max $\frac{1}{2}B$ (if $C = B$)	Under compensation $C - \frac{1}{2}B$ Max $1\frac{1}{2}B$ (if $C = 2B$)

would have been chosen. Based on that, select the policy that minimizes the maximum regret. In case of Hurwicz alpha, the selection of a policy option is based on a weighted average of the worst and the best possible outcomes the different policies. Applied to policy options aimed at the realization of full compensation of the direct purchaser, the “best outcome” is full-compensation. That is, the deviation from full-compensation is zero. In this specific case, the three principles will lead to the identical conclusions.

6. Conclusion

According to the Damages Directive “any natural or legal person who has suffered harm caused by an infringement of competition law is able to claim and to obtain full compensation for that harm”.⁶¹ In the context of cartels, this implies that the direct purchaser should receive compensation equal to the overcharge minus passing-on effect plus volume effect ($A - B + C$). This paper started with the observation that there are “many” judgments regarding the overcharge, “some” judgments regarding passing-on, and “hardly any” judgments where the volume effect plays a role. From the perspective of compensation, this is problematic. Full-compensation of the direct purchaser will not be obtained.

The computation of the overcharge, the passing-on effect and especially the volume effect require information on counterfactual prices and quantities. This information cannot be observed and is not readily available but has to be reconstructed. This is challenging for both parties. In order to claim the overcharge, the claimant has to provide proof of $A = (c_1 - c_0) \times q_1$. In this, c_1 , and q_1 are observable. The problematic part is to provide convincing evidence on the counterfactual non-cartelized price c_0 . For a passing-on defence, the defendant has to provide convincing evidence of $B = (p_1 - p_0) \times q_1$. In this, p_1 , and q_1 are observable. The challenging part for the defendant is to

⁶¹Art. 3 (1).

provide convincing evidence of the counterfactual price p_0 . In order to claim the volume effect, the claimant has to demonstrate $C = (p_0 - c_0) \times (q_0 - q_1)$. Now, if p_0 , c_0 , and q_1 are known from the previous calculations, estimating the elasticity of demand would provide the information required to estimate q_0 , the missing counterfactual quantity required to compute the volume effect. Overall, the volume effect is the most difficult to prove.

In a first-best world the information required for the computation of the volume effect is readily available. In practice, this will not be the case. It may be impossible or too expensive to provide convincing evidence on the volume effect. We considered policy options that aspire to bring compensation closer to full compensation aside. Option (1), representing current policy, boils down to the fact that the size of the volume effect is assumed to be zero, unless the claimant provides proof that the volume effect has a positive size. Option (2) consists of not allowing a passing-on defence; only the overcharge A may be claimed. Option (1) would be consistent with full compensation if $C = 0$; option (2) would be consistent with full compensation if $C = B$. We consider a policy option (3) situated between option (1) and (2): a rebuttable presumption that the volume effect is equal to 50% of the pass-on ($C = 0.5 \times B$).

Option (1) would be a perfect option if the information required for the calculation of the overcharge, pass-on and volume effect is readily available. This, however, appears to be an unachievable ideal. Generally, option (1) will lead to under compensation of the direct purchaser. Option (2) would lead to full compensation of the direct purchaser in the (incidental) case that the volume effect is equal to the size of the pass-on. Otherwise, the effect can be both over- or under-compensation in different circumstances. Of course, policy option (3) only leads to full compensation in the (incidental) case that the volume effect is 50% of the size of the pass-on. The three options only “accidentally” lead to full compensation.

If the size of the volume effect will generally be unknown, the selection of a policy option can be approached as decision making under uncertainty. Based on the maximin principle, option (3) would work well if it can be assumed that size of the volume effect will generally be smaller than the size of pass-on. Theoretical models suggest, however, that the size of the volume effect may be larger than the size of the pass-on. In that case, option (2) would be the better choice. That is, not allowing a passing-on defence may lead to the minimization of the maximum gap between actual and full compensation.

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