

Study on the Passing-on of Overcharges

Final report

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Catalogue number: KD-02-16-916-EN-N

ISBN 978-92-79-61486-6

DOI: 10.2763/590101

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The following law firms have assisted Cuatrecasas, Gonçalves Pereira in the preparation of this Study in conducting an in-depth review of national law and case-law relevant to pass-on across the EU Member States, as well as certain related procedural mechanisms: Accura Advokatpartnerselskab, Arendt & Medernach SA, BarentsKrans N.V, Chiomenti Studio Legale, Haver & Mailänder Rechtsanwälte, Magnusson International Verein, Matheson Law, Michael Kyprianou & Co. LLC, SC VVGB Altra (VVGB Associés) and Wolf Theiss Rechtsanwälte GmbH & Co. KG. A full list of the individual lawyers from each law firm who have contributed to the Study, as well as the jurisdictions they have covered, is provided in the [Appendix](#).

ACKNOWLEDGMENTS

The authors would like to thank the team at DG COMP of the European Commission for all their assistance and guidance over the course of this Study, including in particular Szabolcs Lorincz and Filip Kubik. In preparing the Study, we have also benefitted greatly from discussions with many colleagues and fellow practitioners. We would like to thank them all for their time and valuable insights. Finally, we would like to thank Sébastien Broos (RBB Economics) and Isabel Gómez Baraibar, Nieves Bayon and Sofia Lluch (Cuatrecasas, Gonçalves Pereira) for their assistance in preparing the document.

Executive Summary

Introduction

This Study is intended to provide judges, and other practitioners who are not economic experts, with practical guidance on obtaining and assessing economic evidence in relation to pass-on in the context of competition law infringements. Drawing on relevant economic theory and quantitative methods, as well as relevant legal practice and rules, it sets out a framework for evaluating the plausibility of claims, for quantifying the effects of pass-on, and, accordingly, for assessing the total extent of the harm suffered by a claimant.

EU Directive 2014/104 establishes that any person who has suffered harm caused by a competition law infringement may claim full compensation for that harm. This includes the possibility of indirect claims, which arise when those that are not directly affected by such an infringement (notably, indirect purchasers) are nevertheless harmed as a result of changes in the behaviour of directly affected firms (the direct purchasers) as well as, potentially, other intermediate firms.

There are three distinct elements that make up the recoverable harm potentially suffered by a claimant. First, there is the increase in the claimant's costs ("**the overcharge**") that may be brought about by the infringement: in legal terms, actual harm or direct loss (*damnum emergens*). Such harm may arise directly or because of "upstream" pass-on by a direct or indirect purchaser that supplies the claimant.

Second, the adverse impact of the overcharge on the claimant may be reduced if it passes on some or all of that overcharge to its own customers, by means of a price increase. This is the "**passing-on**" effect. Whilst such "downstream" pass-on reduces the actual harm suffered by the claimant in question, it will do so at the expense of causing harm further downstream. Indeed, the pass-on effect at one level of the supply chain implies an overcharge of the same magnitude at the next level downstream; they are two sides of the same coin.

In litigation, pass-on can, therefore, serve as a "sword", where an indirect purchaser alleges that an overcharge has caused it harm because of upstream pass-on. It can also be used as a "shield", where a defendant alleges that downstream pass-on by a claimant has reduced the actual harm the latter has suffered.

Third, to the extent that a claimant suffers a loss of sales volumes as a consequence of pass-on, it will lose the profit margins associated with those sales. This so-called “**volume effect**” constitutes recoverable loss of profit (*lucrum cessans*) in legal terms and forms part of the overall damage calculation. Whenever a firm increases its prices, it will almost invariably suffer such a loss of sales volumes. It is the extent of this prospective loss, which hinges on the sensitivity (or elasticity) of a firm’s demand to price increases, that tempers the extent of passing-on in the first place.

Case-law and legal framework

Directive 2014/104 establishes the new legal framework for pass-on. The Directive, and its national implementing legislation, will become the principal legal basis for adjudication of pass-on issues by national courts in the EU as this new regime becomes effective. The Directive, notably, confirms the availability of the pass-on defence (with defendants carrying the burden of proving that pass-on has occurred) and establishes a legal presumption of pass-on for indirect purchasers (provided certain conditions are met). It further provides that national courts should be able to estimate pass-on.

Prior to the Directive, the Court of Justice of the European Union had developed case-law on pass-on, principally in the area of reimbursement of taxes or charges unlawfully levied in breach of EU law, which forms part of the *acquis communautaire*. This case-law has *inter alia* stressed the importance of an adequate case-by-case economic analysis to prove pass-on. For their part, national courts have, to date, had limited experience of pass-on questions. Notably, they (and experts) have relied heavily on certain basic parameters (such as the number of firms affected by an overcharge) to assess pass-on when it has been alleged and have tended to adopt rather simple or theoretical approaches to quantification. They have not typically considered the volume effect in their quantification of damages. Experience in the US is far more developed; albeit borne from a very different legal context (for instance, the existence of opt-out class actions). All of these experiences will be of (varying) relevance for national courts: in some circumstances, providing legal parameters for their work and, in others, offering useful practical insight into what may be reasonable means of going about their task and what difficulties they may face.

The Study provides an overview of this past case-law and experience, as well as setting out the key provisions of the Directive.

The economics of pass-on

Pass-on and the associated volume effects arise because of the incentives that a firm may have to respond to increases in its costs by raising prices. Economics can play an important role in identifying such incentives and the sensitivities of pass-on effects to the specific features of the case at hand. As such, it provides a structure for establishing the coherence and plausibility of claims about pass-on, and a framework within which qualitative and quantitative evidence can be evaluated.

Relevant cost effects

Economics suggests that it is changes in a firm's variable (or, more precisely, marginal) costs which will usually have the most immediate influence on pricing decisions. At the same time, fixed costs (i.e. costs that do not vary with the level of output) are predicted to affect those decisions in some specific situations and, notably, over the longer term. On the other hand, small cost changes may have no influence on prices – at least not immediately – if firms incur “menu” costs in adjusting prices, if there are rigidities affecting output adjustment, or if relevant change in costs is not identified as such.

The effects of competition

The extent to which a firm can increase price profitably will depend on the volume of sales it will lose as a result. This, in turn, will depend on the extent to which competitors are themselves affected by the overcharge (pass-on of “industry-wide” overcharges is generally predicted to be greater than for “firm-specific” overcharges of the same magnitude), and the intensity of competition on the market, including the way those rivals will respond to any passing-on by affected firms.

Under textbook conditions of perfect competition, a firm which is the only supplier to experience a cost increase due to an infringement (i.e. the overcharge is firm-specific) will be unable to pass on that overcharge at all. On the other hand, if all competitors are affected, i.e. the impact of the overcharge is industry-wide, the extent of pass-on in this perfectly competitive environment is predicted to depend on the relative price elasticities of supply and demand. Notably, 100% pass-on of industry-wide overcharges is predicted when industry supply is perfectly elastic (i.e. the supply curve is flat).

Where competition is imperfect – and few markets, if any, are likely to resemble the textbook model of “perfect” competition in practice – the pass-on of industry-wide overcharges is generally predicted to increase as competition intensifies, whereas the pass-on of firm-specific overcharges will tend to decrease. However, even under monopoly, a firm can be expected to pass on some of the effect of an overcharge affecting marginal costs. In these imperfectly competitive settings (involving monopoly and oligopoly markets), economic theory indicates that the curvature of demand, i.e. the way that the slope or elasticity of demand changes as price changes, can have an important influence on the magnitude of pass-on. Pass-on rates that exceed 100% are possible, as are much lower rates, as a result. Nevertheless, the influence of demand curvature is predicted to diminish as competition intensifies.

In general, predictions regarding the extent of pass-on will depend on the precise nature of competition, *inter alia*. The more complete the information that is available on relevant facts of the case at hand, the better the guidance that economic theory is likely to be able to provide to courts on the magnitude of pass-on effects.

The impact of buyer power

In some settings, buyer power acts as a constraint on the pricing behaviour of suppliers. It might be supposed that this would automatically enable such buyers to resist the pass-on of overcharges too. However, this may or may not be the case. Instead, a detailed analysis of the characteristics of specific negotiations and the context in which they take place is required to establish pass-on implications.

The relationship between pass-on and volume effects

In general, the pass-on and volume effects will have opposite effects on the harm suffered by a claimant. When the affected purchaser is a monopoly on the downstream market, the volume effect will generally exceed the pass-on effect (though the difference will shrink as the overcharge diminishes). As a result, a measure of the overcharge alone will understate that harm. Outside monopoly, however, the relationship between the pass-on and volume effects in imperfectly competitive settings will also depend on the strategic responses of competitors. If competitors would respond to an increase in the affected firm’s prices by also raising their own prices, this will tend to reduce the harm, all else being equal. Conversely, if rivals would expand their output in response to a reduction in the affected firm’s sales, then this will tend to magnify the harm.

Quantifying the impact of pass-on

Sound economic analysis will take into account all available evidence and, if possible, be supported by robust empirical analysis. This Study presents a number of approaches to estimating the passing-on and volume effects. The focus is on quantitative approaches. Where the availability of suitable data is limited, however, experts may have to rely on more qualitative evidence (e.g. documents and statements on how firms set prices).

Sequential approaches

Experts may consider estimating the three components of damages separately or sequentially. Quantification of the overcharge that increases the claimant's costs will typically constitute the first step. If that overcharge is positive, even if small, the next step is to consider whether and, if so, to what extent this has been passed on. Where pass-on has occurred, it is then relevant to consider the extent to which the claimant has lost sales volumes as a result.

Pass-on effects

The main challenge in estimating the pass-on effect is to obtain a measure of the **relevant price increase** (on the downstream market). Doing so requires a measure of the counterfactual price which would have prevailed 'but for' the infringement. The pass-on effect can then be computed by multiplying the estimated price increase by the volume of the firm's sales.

Where relevant data is available, experts may adopt a **direct approach** to this task, i.e. using price information directly to estimate the increase brought about by passing-on of the overcharge. This will involve the use of comparator-based techniques, as can also be used to estimate the initial overcharge. Candidate benchmarks for the counterfactual price include the prices of (i) the affected product before or after the infringement period (the "before/during/after" approach), and (ii) the same or similar products in different geographies, that were not subject to the infringement (a "benchmarking" approach). A combination of these two techniques (a "difference-in-differences" approach) may yield more robust results.

Economics indicates that the change in prices resulting from an overcharge can also be calculated by multiplying the relevant part of the overcharge (i.e. the absolute amount by which marginal costs have been increased) by a **measure of the relevant pass-on rate**. This is the rate at which changes in costs are

translated into changes in prices. A pass-on rate can be estimated where cost and price data are observable, including using multi-variable regression techniques. Evidence in respect of firm's pricing policies will also offer relevant insight. An expert might also draw on pre-existing estimates of pass-on rates.

An important practical consideration is whether pass-on rates estimated in a different set of circumstances provide an appropriate measure of the pass-on rate in the case at hand. For example, pass-on rates might differ according to the scale of the cost changes concerned or according to the input that is affected. This may be a particular issue when such pass-on rates are used to estimate the effects of a (small) overcharge that cannot be identified directly.

Volume effects

The volume effect can be computed by multiplying the margin the purchaser would have earned 'but for' the infringement (i.e. **the counterfactual margin**) by the **reduction in volume sold** that results from passing on the overcharge.

If the purchaser has passed on only part of the overcharge (that is, the pass-on rate is below 100%), then the observed margin during the infringement period can be very different to the counterfactual margin. Information on the pass-on effect can be used to make an appropriate adjustment. Alternatively, the expert may consider using comparator-based techniques to recover a measure of the counterfactual margin.

To quantify the reduction in volume sold, comparator-based techniques can again be deployed. Alternatively, the expert may consider using a measure of the elasticity (or price sensitivity) of demand for the product or service in question, combined with an estimate of the pass-on effect on price. Because the elasticity varies with price changes, this will deliver an approximate estimate of the volume loss.

Moreover, the choice of the appropriate elasticity is important. When a whole market is subject to an overcharge (and all firms are affected similarly), economics suggests that an estimate of the aggregate market demand elasticity is likely to provide the best measure of the proportionate impact on any firm's sales, since it captures the consequences of a market-wide increase in prices. However, a measure of the affected firm's own-price elasticity of demand may provide a better starting point when an overcharge is firm-specific. Nevertheless,

in this case, any volume loss estimates may also need to account for the impact of competitors' price (alternatively, output) responses.

Further, at the cost of imposing additional structure, economic theory can simplify the volume effect calculation by replacing the need for a measure of elasticity, albeit an appropriate account of competitors' response will still be required.

Holistic approaches

Experts may consider adopting a holistic approach which calculates total damage in an integrated way, accounting simultaneously for the pass-on and the volume effects. Discount and simulation approaches constitute two such approaches, both drawing on formal economic models. By introducing additional (assumed) structure to the calculation, these approaches may reduce the data requirements to allow an expert who already has an estimate of the initial overcharge to put a specific value on the purchaser's total economic loss.

Ranking and reliability

The reliability of the damage estimate will depend primarily on the quality of the information (or data) used and the nature of the assumptions adopted.

In general, the holistic approaches rely on economic models that make relatively strong assumptions about firm and consumer behaviour. These models can only provide a reliable basis for predicting market outcomes, therefore, if these assumptions reflect the realities of the market. Hence, motivation for relevant modelling choices will be especially important in these cases.

In contrast, the sequential approach does not rely to the same extent on particular behavioural assumptions. Instead, comparator-based techniques, which can be used to derive estimates of counterfactual prices, margins, and volumes, depend mostly on finding suitable benchmarks that are uncontaminated by the infringement, as well as gathering sufficient data to control for confounding influences, notably using multi-variable regression analysis. Other, less sophisticated, techniques may also be considered where the available data are limited or when using more sophisticated analyses would be disproportionate. The costs and benefits of adopting alternative approaches should be identified.

The accuracy with which the pass-on rate can be estimated depends largely on the amount of information (notably, data) available. For instance, when there is not sufficient relevant data available, experts may have to rely on pass-on rates

derived in different circumstances, assuming thereby that the relevant pass-on rate is the same. Where such assumptions prove critical to the estimates of harm, they should be tested against relevant facts.

The assumptions which underpin a particular quantification exercise should be set out transparently, and their plausibility explored. This includes a description of data sources and any data manipulations that have been undertaken. Where possible, the sensitivity of estimates to the specific assumptions adopted and the quality of the data used should be explored. For instance, the expert may evaluate how results vary if plausible adjustments to key assumptions are made. Moreover, where detailed data analysis has been conducted, the expert can obtain statistical measures of the potential margins of error associated with the estimated parameters of interest.

The judge's role of assessing economic evidence of pass-on

Where pass-on is invoked, national courts are charged with assessing economic evidence of pass-on as part of their task of evaluating its existence and extent in accordance with national legal rules of evidence, causation and standard of proof (within the framework of EU rules in relation *inter alia* to burden of proof and presumptions, as well as the principles of effectiveness and full compensation). This judicial task will necessarily involve consideration of all relevant evidence adduced by the parties, including evidence of a factual nature (such as a firm's pricing policies). These, and other issues of particular relevance to courts' assessment of economic evidence of pass-on, are also addressed in this Study.

Disclosure

The Study considers a number of ways for courts to manage effectively the access of parties to documentation and information held by other parties to litigation or other non-litigating firms, in order to prove pass-on. Judges should take adequate control of such disclosure processes, ensuring fulfilment of the principles of reasonableness and proportionality. Economic experts can assist judges in this task; e.g. by assessing whether pass-on is sufficiently plausible in the circumstances of the case, or explaining why access to certain data can be expected to result in better estimates of pass-on effects. Mechanisms for ensuring the adequate confidentiality of business secrets which have to be shared are also relevant.

Use of economic experts

The rules on expert evidence vary significantly between the EU Member States. Nevertheless, judges may employ a number of aids and mechanisms to maximize the usefulness of that evidence; including: (i) the use of qualified court-appointed experts and/or party experts; (ii) the exchange of information, and discussion of approaches, by experts (whether appointed by the parties or by the court) with a view to narrowing issues; and (iii) the testing of conflicting evidence. The Study provides some insight into these types of procedural tools.

Parallel Proceedings

Courts may be called to consider the existence of separate judicial proceedings where pass-on in the same or similar circumstances is (or has been) an issue. Courts have a duty in such cases to try to avoid inconsistent rulings and, accordingly, to ensure results which are coherent from an economic (as well as a legal) perspective; albeit such duties are by no means absolute. More generally, the economic treatment of similar issues in other proceedings may offer useful insight or serve as a point of contrast. The Study considers what mechanisms may be available to courts in these circumstances.

39 steps: a checklist for judges

Finally, to assist national courts in assessing economic evidence in relation to the quantification of pass-on and volume effects, this Study contains a practical checklist of issues which may arise, organised around a set of key questions. This is designed to help courts understand and evaluate the economic evidence adduced.

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Introduction

1. Article 16 of EU Directive 2014/104¹ (the “**Directive**”) provides that the European Commission is to **issue guidelines on how to estimate the share of pass-on of the overcharge to indirect purchasers**. Such guidelines (the “**Pass-on Guidelines**”) may, building on the Commission’s practical guide on quantifying harm for breaches of competition law (“**EC Practical Guide**”),² include economic tools for estimating pass-on as well as practical guidelines for judges on how to assess economic expert evidence. This Study is aimed to assist the Commission in that work.

A. Scope of the Study

2. In the preparation of this Study, its authors, RBB Economics and Cuatrecasas, Gonçalves Pereira, have carried out the following principal tasks:
 - On the economics side, a review, analysis, and exposition of the economics of passing-on, and a detailed appraisal of quantitative techniques for evaluating passing-on and volume effects. As such, this complements previous analysis of overcharge effects. This has included careful consideration of the principal factors identified in economic theory as affecting the extent of the passing-on and volume components of antitrust damages. It has also involved careful consideration of different quantification methods and their information requirements.
 - On the legal side, a thorough and in-depth analysis of case-law, practice, rules and proceedings in relation to pass-on in all EU Member States. This has included, where possible, insight from non-published cases and extrajudicial settlement scenarios. The work has been carried out where necessary with the support of local counsel in certain jurisdictions³ and with the benefit of additional input from a number of judges, experts and

¹ 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 law for infringements of the competition law provisions of the Member States and of the European Union [2014] OJ L349/1.

² 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, 11 June 2013, SWD(2013) 205 and the Commission’s Communication 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, [2013] OJ C167/07 (“**2013 Communication**”).

³ For a full list of the Subcontractors, see the [Appendix](#).

stakeholders involved in some of the most relevant cases.⁴ In addition, a review has been carried out of relevant EU law and, with the assistance of local experts, a comparative review has been conducted of North American law and practice in this area.

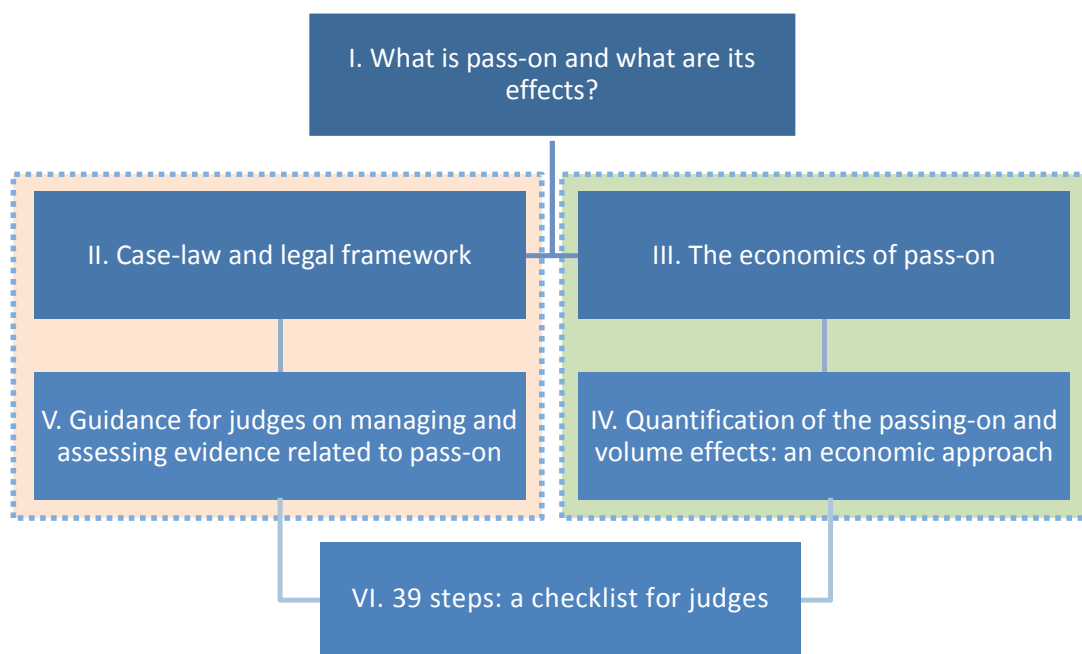
3. The objective of the Study is to provide practical guidelines to national judges (as well as insight for practitioners) on how to assess economic evidence of passing-on when pass-on is raised by parties to private litigation arising out of a breach of competition law, with particular focus on quantitative methods of estimation.

B. Structure of the Study

4. The Study is split into six parts as follows:
 - I. **What is pass-on and what are its effects?**, which describes the contexts in which pass-on of overcharges resulting from competition law infringements may arise and provides a basic introduction into its economic effects.
 - II. **Case-law and legal framework**, which sets out past law and practice related to pass-on, including case-law of the Court of Justice of the European Union and national rulings on pass-on in competition damages cases, as well as insight from the law in the US. Finally, this section identifies the relevant provisions for pass-on in the Directive and provides a key for cross-reference to the relevant sections of the Study which relate to those provisions.
 - III. **The economics of pass-on**, which first sets out a primer on the microeconomics of firms' pricing decisions and their relationship with firms' costs and the competitive environment, before considering in detail the factors affecting the pass-on of industry-wide and firm-specific overcharges by direct and indirect purchasers, as well as the associated volume effects.
 - IV. **Economic methods of quantification**, which presents a number of different empirical approaches to quantifying passing-on and volume effects, identifying the key parameters of those effects that need to be estimated, and evaluating methods for doing so.

⁴ This has included, for example, speaking to judges, lawyers and/or economists involved in leading cases such as *Air Cargo*, *National Grid* and *Cooper Tire* in the UK, *Air Cargo* in the Netherlands, *DOUX Aliments* in France, *Cheminova* in Denmark and *Car Glass* in Germany.

- V. Guidance for judges on managing and assessing evidence related to pass-on**, which includes practical recommendations on issues such as causation, disclosure, dealing with economic expert witnesses and other types of evidence, as well as on how to coordinate parallel proceedings on related pass-on issues.
 - VI. Checklist for judges**, which is a practical tool, organised around a list of 39 questions, to assist judges in the assessment of economic evidence of pass-on, based on the contents of this Study.
5. The Study offers practical and in-depth insight into the economics of pass-on and its quantification, while also illustrating from a more legal perspective how economic evidence of this kind may be framed within the judicial function of assessing damages claims. The structure of this Study can be represented as follows:



1. What is pass-on and what are its effects?

6. In this first section of the Study, we offer a brief overview of the variety of situations in which direct and indirect claims for damages may be affected by passing-on. We also provide an introduction to the passing-on effect itself, as well as the intrinsically-related volume effect, and to their influence on and contribution to the magnitude and distribution of damages resulting from competition law infringements.

1.A. Potential claims at different levels of the supply chain

1.A.1. Direct and indirect purchaser claims

7. EU law establishes that any person who has suffered harm caused by a competition law infringement may claim compensation for that harm,⁵ including direct and indirect purchasers of the products or services which have been affected by the infringement.⁶ Specifically, **indirect purchasers** are defined in the Directive as any person “*who acquired, not directly from an infringer, but from a direct purchaser or a subsequent purchaser, products or services that were the object of an infringement of competition law, or products or services containing them or derived therefrom*”.⁷ It is the pass-on to such indirect purchasers which is the focus of this Study.⁸
8. Indirect purchaser claims arise when such purchasers are harmed as a result of changes in the behaviour of directly affected firms (the **direct purchasers**). This may happen if a direct purchaser (as well, potentially, as subsequent intermediate purchasers) responds to an overcharge by raising its own prices. In this case, some of the effects of the infringement will be “passed on” (or “passed through”)⁹ to that firm’s own customers, i.e. to indirect purchasers. Such passing-on, if it occurs, will reduce the actual loss suffered by the directly affected firm, whilst shifting some of that damage to indirect purchasers. At the same time, it will generally lead to a decrease in the volume of sales for the direct purchaser – all else equal – as its own sales price(s) are increased, thereby causing it a loss of profit.¹⁰ (Indeed, this adverse volume effect may more than offset the impact of the passing-on effect.) Indirect purchasers’

⁵ Article 3(1) of the Directive; CJEU rulings: See to this effect judgment in *Courage and Crehan*, C-453/99, EU:C:2001:465 and judgment in *Manfredi*, C-295/04, EU:C:2006:461.

⁶ Article 12(1) of the Directive.

⁷ Article 2(24) of the Directive.

⁸ In accordance with Article 16 of the Directive, previously cited.

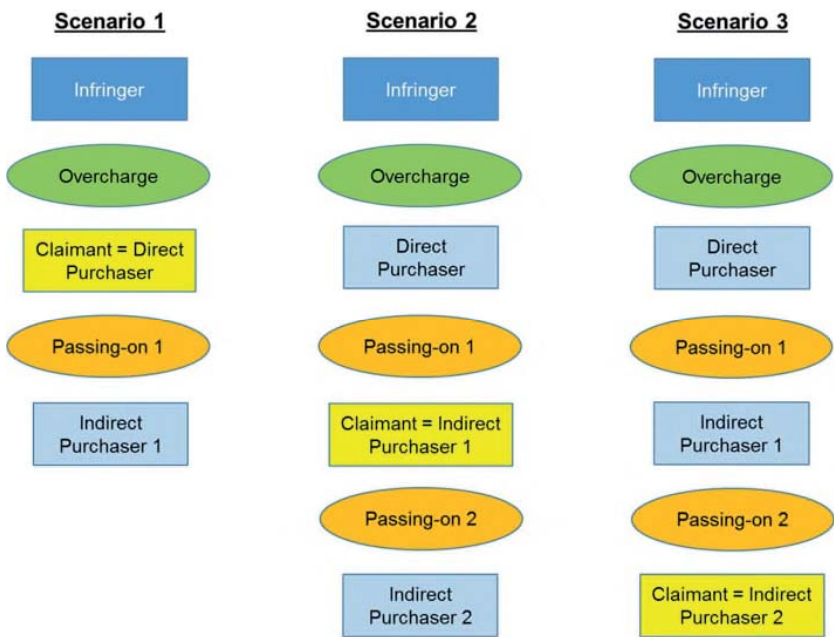
⁹ We use the terms pass-on, pass-through, passing-on etc. interchangeably in this Study. See further [Annex A](#) for a glossary of terms used in this Study.

¹⁰ See Article 12(3) of the Directive and, *inter alia*, paragraph 26 below.

customers may be affected too, as the effects of the infringement are passed on further down the supply chain; that is, indirect purchasers may be affected at further, lower, levels of the supply chain.

9. In summary: passing-on potentially has a role both as a cause of reduced actual loss (i.e. direct overcharge harm) to a given purchaser and as a cause of such actual loss further down the supply chain, as well as being a prospective cause of loss of profits on sales where a purchaser has passed on all or part of the overcharge.
10. Depending on the nature of the supply chain and the setting for the passing-on, claimants may potentially include a broad range of categories of persons. One may distinguish, for example (i) between direct and indirect purchasers, and (ii) between customers at the end of a supply chain and those at intermediate levels. For explanatory purposes, three typical and relatively simple scenarios in which pass-on arises are illustrated in **Figure 1** below. We will draw on these stylised examples in a number of sections of this Study to aid the explanation of relevant economic theory and methodologies.

Figure 1: Some pass-on scenarios



11. In Scenario 1, the Claimant (highlighted in yellow in the left hand panel of **Figure 1**) is a direct purchaser that makes a claim against a competition law infringer that has overcharged for the goods it supplies to that purchaser.

What is pass-on and what are its effects?

The Infringer raises the passing-on defence, arguing that the actual loss suffered by the Claimant is reduced by virtue of the fact that it has passed on part or all of the overcharge to its own customer – Indirect Purchaser 1.

12. In Scenario 2, the relevant claimant (Indirect Purchaser 1, highlighted in yellow in the central panel of **Figure 1**) is an indirect purchaser supplied by the Direct Purchaser. In this scenario, the indirect purchaser who is the claimant is not an end customer. This claimant argues that it has suffered harm as a result of the infringement because the Direct Purchaser has passed on some of the impact of the overcharge, as indicated by Passing-on 1. At the same time, in this case the Infringer may argue that the damage suffered by Indirect Purchaser 1 has been limited by the latter's ability to pass on all or some of the adverse effects to its own customer – Indirect Purchaser 2 – via Passing-on 2.
13. In Scenario 3, the claimant (Indirect Purchaser 2, highlighted in yellow in the right hand panel of **Figure 1**) is an indirect purchaser and end customer. The basis for the claim is that harm arising from the original overcharge has been passed on sequentially by both the Direct Purchaser and Indirect Purchaser 1. Note that, because this indirect purchaser is an end customer, no pass-on defence can be raised by the Infringer.
14. It is worth noting that in these different scenarios one may be assessing either what is referred to as "upstream pass-on" or, alternatively, "downstream pass-on" or, indeed, both. In the case of the passing-on defence invoked by a defendant (competition law infringer), we will be discussing the existence and extent of pass-on downstream of the claimant – this is downstream pass-on. This is also sometimes referred to as the use of pass-on as a "shield" because it may allow infringers to avoid or reduce their liability. In the case of an indirect purchaser claim, the claimant will be invoking the existence of pass-on upstream by the direct purchaser and possibly intermediate indirect purchasers – this is upstream pass-on. The use of pass-on by indirect purchasers in this way has sometimes been referred to as the use of pass-on as a "sword" because it allows them to claim damages in respect of infringements that have not affected them directly. In the case of claims by indirect purchasers who are not end customers, both upstream and downstream pass-on may be in play.

1.A.2. Illustrative examples

15. Pass-on may potentially occur in a wide variety of situations. Some cases, notably in which direct purchasers simply resell the overcharged product or service, may, depending on specific facts and market dynamics, provide relatively more straightforward scenarios. Others, such as those in which

Study on the Passing-on of Overcharges

products or services are incorporated as inputs into downstream products or services, may be more complex. In **Box 1** and **Box 2** below we provide some examples which may help to illustrate the potential pass-on scenarios and the factual complexity that can arise in relation to pass-on.

Box 1: Examples of possible pass-on scenarios

Pass-on scenarios may include situations where a direct or indirect purchaser, for example:

- *retails or distributes the affected product, essentially unmodified*; e.g. a wholesaler that sells cement purchased from participants in an import cartel;
- *uses the affected product or service as an input or component in the manufacture or sale of downstream products or services*; e.g., a mobile telephone manufacturer whose devices incorporate an electronic component which has been subject to an infringement and priced excessively; or
- *transforms the affected input (possibly in conjunction with others) into a product which it sells to others*; e.g., a manufacturer of confectionery products that uses sugar supplied by a cartel participant.

Box 2: Examples of possible pass-on scenarios along more complex supply chains

Claims for damages may also originate along more complex, and extended, supply chains, such as for example:

- *an indirect purchaser which sells downstream products or services that incorporate or utilise a product or service purchased from a firm which incorporates a product or service purchased directly or indirectly from the cartel*; e.g. a retailer that sells cars which incorporate mobile phone technologies that utilise components that have been subject to a cartel, or a manufacturer who uses the services of a shipper that, in turn, obtains airfreight services provided by airlines from a freight forwarder, where the airlines and the freight forwarder have engaged in separate cartel activities; or
- *a purchaser who utilises the cartelised product in undertaking its business operation more generally*; e.g. an electricity company that uses power cables whose supply has been the subject of a cartel; or
- *the alleged passing-on of so-called "ambient costs" which have been affected by a cartel*; as considered in a classic illustration in which the costs a law firm incurs providing coffee to its employees are inflated as a result of overcharges caused by a coffee cartel.

1.A.3. Examples of broader groups of potentially affected parties

16. Since a price-increasing overcharge will typically reduce demand for the infringer's outputs, it is also liable to reduce the infringer's own demand for inputs. Consequently, there is scope for that overcharge to cause damage to the infringer's upstream suppliers, as well as downstream of the infringement in this way too.¹¹

¹¹ See, for example, Han, Schinkel, and Tuinstra (2008).

What is pass-on and what are its effects?

17. Furthermore, the Directive specifically contemplates situations in which a buyer-side infringement (e.g. a buyers' cartel) causes a lower price to be paid to a direct supplier which may, in turn, be passed on upstream in the form of lower prices paid to (indirect) suppliers of that direct supplier.¹² For example, such could be the case if an industrial milk buyers' cartel were to have reduced the price paid for milk to dairies and this reduction, in turn, was passed on to dairy farmers by the dairies. The extent of any upstream pass-on of such "undercharges" would likely depend on the specific nature of the negotiations between indirect and direct suppliers, and the effect of a reduction in downstream prices on these, as well as the impact of the infringement on volumes purchased. This is considered further in Section III.B.6 below, in the context of the impact of buyer power on pass-on more generally.
18. Further, the direct or indirect purchaser's pass-on of overcharges in price increases may cause its rivals to change their market behaviour (even if they are unaffected by the original overcharge or the pass-on of that overcharge directly), thereby affecting these rivals' customers adversely too. This could be classed as an "umbrella" passing-on effect.
19. An increase in the prices of the infringing firms' products will tend to reduce demand for complementary products, as well as increasing demand for substitute products. Hence, suppliers of complementary products are also liable to incur damages as a result of the infringement, whilst suppliers of substitute products are liable to gain. Further, these 'spill-over' effects will have knock-on consequences of their own down the supply chain.
20. Accordingly, the passing-on of overcharges may have broader effects; that is, there could potentially be effects on parties other than direct and indirect purchasers and these could include effects other than a passing-on of cost. Such broader effects do not fall within the scope of the Pass-on Guidelines foreseen in the Directive and, accordingly, are not the subject of this Study.

I.A.4. A note on causation

21. All of the scenarios of pass-on considered above (and particularly those that involve more remote or collateral effects) raise issues from the point of view of causation as a matter of law which national courts will need to consider in the context of civil damages claims. Economic methods to address these issues are presented in this Study, with a particular focus on the scenarios set out in Section I.A.1 above. We will briefly touch on the discrete requirements of causation in Section V.A below and go on in the remainder of Section V to provide guidance on how judges may go about meeting those requirements in

¹² See Article 12(4) and paragraph 43 of the Preamble to the Directive.

their assessment and management of procedures and evidence in competition litigation cases.

I.B. The basics of passing-on

I.B.1. Introduction

22. For illustrative purpose, we will introduce the passing-on effect and the corresponding output effect by reference to Scenario 1 above, the simplest vertical structure in which these effects may arise, namely one in which there are three levels to the supply chain.

- the **upstream level**, where the competition infringement has taken place;
- the **direct purchaser level**; and
- the **indirect purchaser level**, consisting of an **end customer**

I.B.2. Impact on direct purchasers

23. We take as given that the upstream level is subject to an infringement that causes at least some suppliers to set prices above competitive levels (e.g. because the market is cartelised). This has an immediate negative impact on the direct purchaser. The price of one of its inputs is inflated, leading to an increase in its costs. In other words, there is an overcharge. However, by raising its own price in turn, the direct purchaser might be able to pass on some or all of the cost increase to its customers. Therefore, estimating antitrust damages when direct purchasers are not end customers raises the question of whether the illegal price increase has been passed on further downstream to indirect purchasers, which, in turn, affects the distribution of damages between undertakings at different levels of the supply chain.

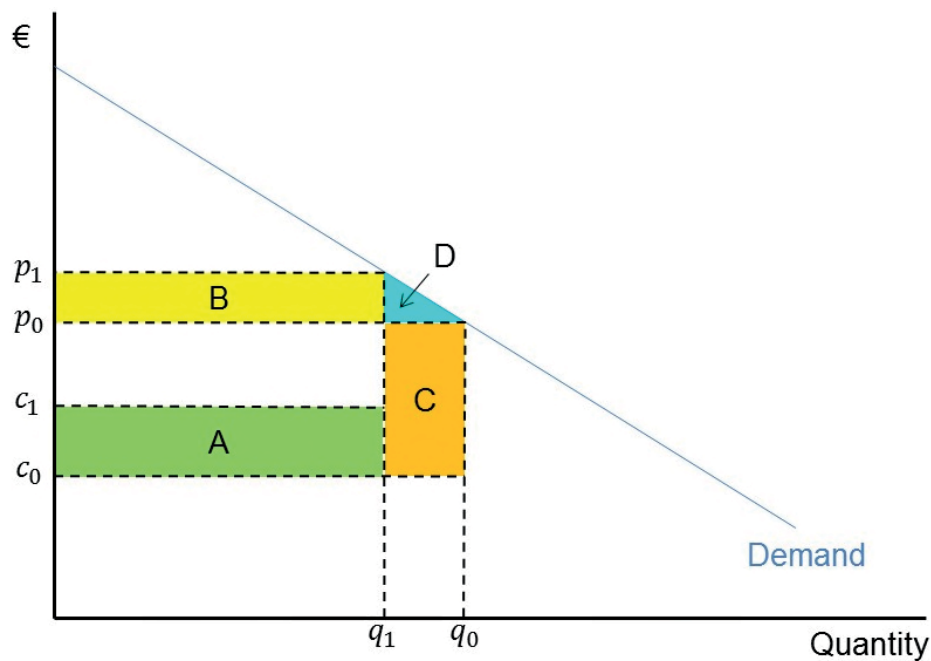
24. **Figure 2** below identifies the **three components** that contribute to the quantum of antitrust damages suffered by the direct purchaser as a result of the illegal price increase at the upstream level. The figure shows the impact that the input price increase has on the direct purchaser's costs of supplying products or services further downstream.¹³ When the purchaser raises its price to its own customers (i.e. indirect purchasers) in response to an overcharge, this gives rise to a passing-on effect. At the same time, that increase in prices

¹³ The impact of the input price increase is represented in terms of units of the direct purchaser's output. If two units of the input are used to produce each unit of the direct purchaser's output, a €1 increase in the unit price of the input will translate into a €2 increase in the direct purchaser's unit costs.

can be expected to result in reduced demand for the direct purchaser's products or services – i.e. a volume effect.

25. The values of prices and costs are represented on the vertical axis; quantity is represented on the horizontal axis. The downward-sloping demand curve gives the relationship between the quantity demanded and the price charged, with fewer units being demanded the higher is the price charged (linear or constant slope demand is illustrated). Absent the infringement, the direct purchaser would have sold q_0 units of output at a price p_0 and incurred a (constant) unit cost c_0 on each unit sold. At that price, it would have earned a margin of $p_0 - c_0$ on each sale made. However, as a result of the overcharge, which increases the direct purchaser's unit cost to c_1 , the direct purchaser charges a higher price, p_1 , and sells a reduced quantity of output, q_1 .

Figure 2: Impact of an overcharge with two layers of downstream purchasers¹⁴



26. The **three components** of loss resulting from the infringement are, therefore, as follows:

- **Area A - the overcharge (or cost) effect:** The direct purchaser is harmed by the illegal price increase, as it faces higher costs. As shown in **Figure 2** above, its unit costs increase from c_0 to c_1 . The harmful impact

¹⁴ The notation used in this figure is explained in paragraph 25.

Study on the Passing-on of Overcharges

of this cost increase on the direct purchaser's profit from supplying output q_1 is given by Area A. The area can be computed by multiplying q_1 , the actual level of output, by the amount of the unit cost increase, c_1 minus c_0 .

$$\text{Overcharge effect} = \text{Area A} = q_1 \times (c_1 - c_0)$$

This is equivalent to multiplying the volume of input purchased with the increase in the price of the input.¹⁵ (Note that the increase in the direct purchaser's unit costs, $c_1 - c_0$, equals the increase in the input price, i.e. the original unit overcharge, if – but only if – one unit of input is used to produce each unit of output at the downstream level. If, on the other hand, two units of the input are used to produce each unit of the direct customer's output, for example, a €1 increase in the unit price of the input will translate into a €2 increase in the direct customer's unit costs.)

- **Area B - the passing-on effect:** To minimise the adverse effect of the overcharge, the direct purchaser may pass on at least some of the marginal cost increase in its own prices. In this case, while Area A still corresponds to the harmful impact from the cost increase, it is not the only factor that determines the damage suffered by the direct purchaser. If the direct purchaser increased prices from p_0 to p_1 , it will have gained extra revenue – and profit – given by Area B. This area can be computed by multiplying the observed level of output, q_1 , with the downstream price increase, p_1 minus p_0 .

$$\text{Passing-on effect} = \text{Area B} = q_1 \times (p_1 - p_0)$$

- **Area C - the “lost business” or volume effect:** Where the direct purchaser raises prices to its own customers (indirect purchasers), the latter will generally make fewer purchases, leading to a reduction in the volume of the direct purchaser's sales. In the figure, the lost sales volume corresponds to the difference between q_0 and q_1 . The lost profit from this reduction in sales is given by Area C, which is obtained by multiplying this lost volume with $p_0 - c_0$, the profit margin secured by the direct purchaser in the counterfactual (i.e. the margin that would have been earned, in the absence of the infringement, without any overcharge or passing-on effect).

$$\text{Volume effect} = \text{Area C} = (p_0 - c_0) \times (q_1 - q_0)$$

¹⁵ In cases where the possibility of input substitution can be put to one side.

What is pass-on and what are its effects?

27. In economic terms, therefore, the overall damage sustained by the direct purchaser in this case is given by:

$$\text{Damage} = \text{Overcharge effect} - \text{Pass-on effect} + \text{Volume effect}$$

Or, in terms of the areas identified graphically in **Figure 2**:

$$\text{Damage} = \text{Area A} - \text{Area B} + \text{Area C}$$

28. This Study will focus on the estimation of Area B (the passing-on effect) and Area C (the volume effect). The overcharge effect, Area A, was considered in detail in the EC Practical Guide.¹⁶

I.B.3. Relationships between the components of loss

29. As is apparent from **Figure 2**, the relative magnitudes of the overcharge (Area A) and pass-on (Area B) effects will depend on the extent of cost pass-on; more specifically, the proportion of the increase in the direct purchaser's relevant unit costs that is passed on in its own prices.
30. At the same time, the volume effect (Area C) also contributes to the overall extent of the damage. Simply subtracting the pass-on effect from the overcharge effect leads to an underestimation of the loss sustained by the direct purchaser (and the indirect purchaser), on account of this volume effect.
31. Consideration of the overcharge term alone will provide an accurate measure of the overall loss suffered by the direct purchaser only if the pass-on effect exactly offsets the volume effect; i.e. Area B equals Area C. If, instead, the pass-on effect is greater than the volume effect, then taking into account only the overcharge will overstate the overall damage sustained by the direct purchaser. Conversely, if the pass-on effect is smaller than the volume effect then consideration of the overcharge alone will result in the damage sustained by the direct purchaser being under-stated.

I.B.4. Impact on end customers

32. In **Figure 2** above, the direct purchaser serves end customers. Importantly, any pass-on by the direct purchaser causes prices paid by these end customers to be inflated, resulting in adverse welfare effects for those end customers. (As they are end customers, there is no scope for them to pass-on any of the impact themselves.)

¹⁶ See EC Practical Guide at paragraphs 136-174.

33. The quantum of the loss suffered by end customers can be broken down into two components, namely:
- **A downstream overcharge effect**, because end customers will pay more for the units they continue to consume, on account of the pass-on of the original, upstream overcharge to end customer prices by the direct purchaser; and
 - **A lost consumption effect**, arising because consumption will be reduced from q_0 units to q_1 units on account of that increase in the end customer price.
34. As illustrated by **Figure 2**, the overcharge effect at the end customer level is equal to the pass-on effect at the level immediately 'upstream' (Area B); i.e. the direct purchaser level in the present example. The price increase applied by the direct purchaser (which if multiplied by volume sold gives the passing-on effect) corresponds exactly to the unit overcharge suffered by end customers (which, multiplied by the volume purchased, gives the overcharge effect). In other words, if the direct purchaser raises prices by €5, for example, as a result of the infringement, end customers pay €5 more for each unit of the product that they purchase. Hence, the profit gained by the direct purchaser as a result of passing-on is just a transfer from end customers.
35. The reduction in consumption brought about by the passing-on of the overcharge causes an additional welfare loss for end customers (analogous to the lost output effect described previously). A measure of this additional welfare effect is given by the difference between the value – as indicated by the height of the demand curve in **Figure 2** – that end customers would have derived from the lost consumption, and the price, p_0 , that they would have paid for it absent passing-on. It is represented by the so-called deadweight loss triangle – Area D – in **Figure 2**.
36. We do not consider further the lost consumption effect (or the deadweight loss represented by Area D in **Figure 2**) in this Study because this effect lies beyond its scope and that of the Pass-on Guidelines as defined in Article 16 of the Directive. To recall, this Study relates to estimating the share of the overcharge which has been passed on to indirect purchasers (actual harm) and the linked volume effect (loss of profit). Deadweight loss relates to another category of loss; specifically the loss of utility or satisfaction of end customers which would result from being denied the enjoyment of some consumption as a result of inflated prices. Further, to our knowledge, this category of loss is currently unlikely to be considered recoverable loss in most national EU Member State legal systems (given, *inter alia*, the

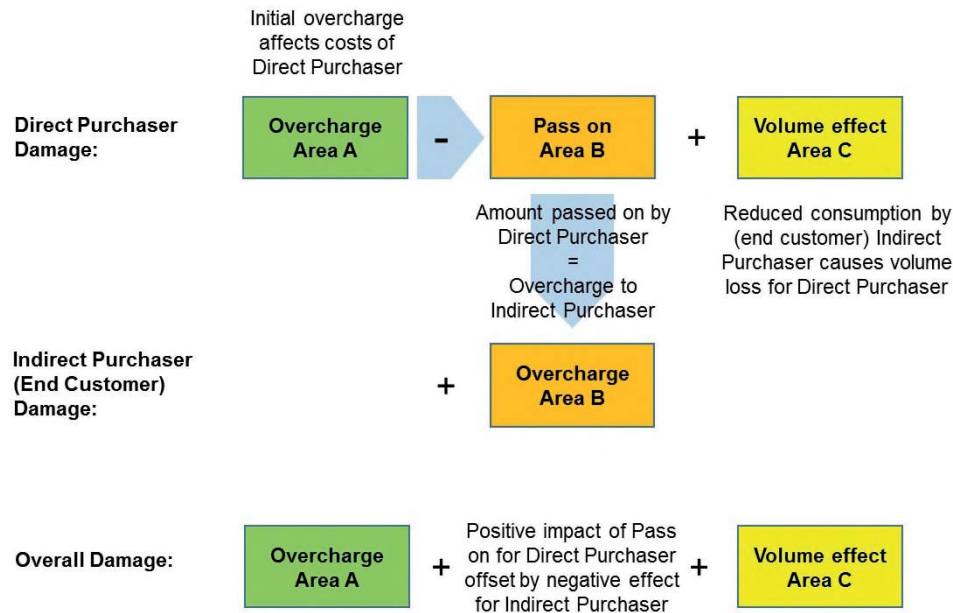
traditional categories of damages accepted by the laws of tort and the requirements of legal standing).

I.B.5. Overall damage to direct purchasers and end customers¹⁷

37. It should be evident from the discussion above that the overcharge effect at one level in the supply chain and the passing-on effect at the previous level are two sides of the same coin. Hence in terms of overall, aggregated damage, these components cancel each other out. Indeed, if pass-on reduces the harm caused to firms at the upstream level, logically, it follows that it results in an offsetting, additional source of damage to firms and/or end customers immediately downstream.
38. In terms of the components of loss illustrated in **Figure 2** above, in a simple case involving **only** two levels (direct purchasers and end customer indirect purchasers), the overall damage arising from the original overcharge is the sum of (1) the initial overcharge effect (Area A), and (2) the direct purchaser lost output effect (Area C). In other words, the passing-on effect (Area B), which cancels out between the direct purchaser and end customers, is not part of the net overall downstream damage, though the extent of the passing-on of the original price increase is, of course, a key determinant of the magnitude of the volume effect.
39. This is illustrated in **Figure 3** below.

¹⁷ We refer to damage in this section because we wish to refer not to loss in a pure economic sense, but rather to damage in the legal sense of recoverable harm, and thereby set the framework for the discussion in the rest of this Study. It is for this reason, and for the reasons further explained above in [Section I.B.4](#), that the deadweight loss effect (Area D in **Figure 2**) is not included.

Figure 3: Aggregate damages for Direct Purchaser and End Customer

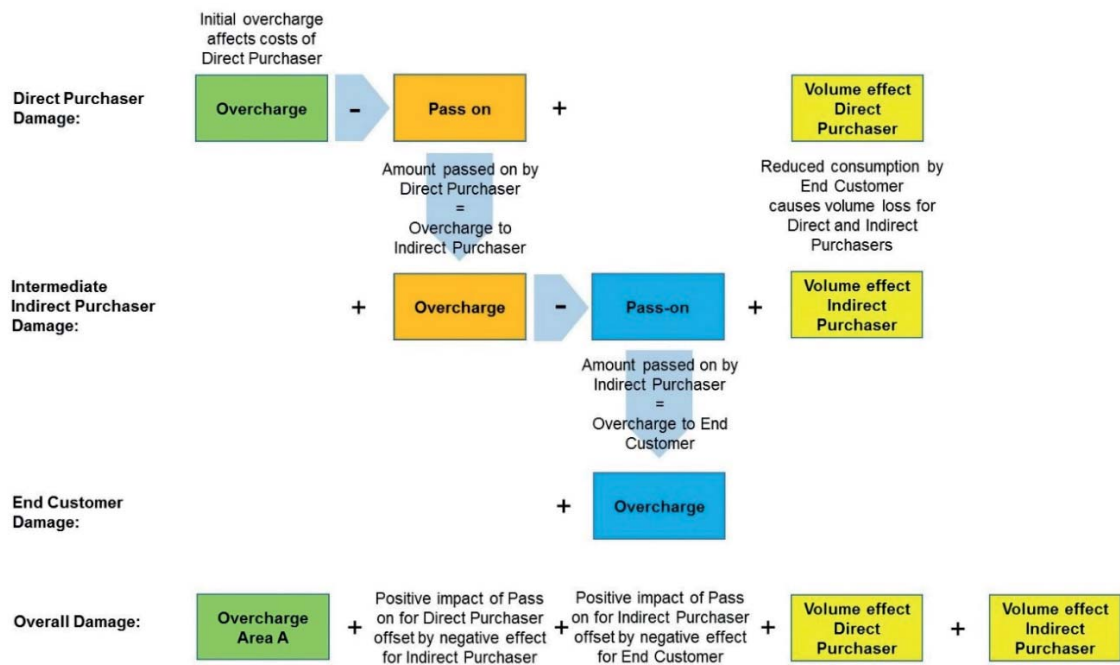


I.B.6. Impact on intermediate indirect purchasers

40. For illustrative simplicity, we have contemplated a scenario above in which direct purchasers sell to end customers. In other words, there are no intermediate indirect purchasers. In general, however, it will also be relevant to consider the impact on such indirect purchasers along more extended supply chains.
41. With one modification, **Figure 2** in [Section I.B.2](#) above can also be used to illustrate the various components that make up the loss incurred by intermediate indirect purchasers. In this case, Area A represents the profit lost by indirect purchasers at a given level in the supply chain as a result of pass-on by direct (or other indirect) customers immediately upstream of them, rather than the original overcharge itself. Moreover, Areas B and C represent the possible passing-on and volume effects respectively that may have to be taken into account to compute the loss suffered by the indirect purchaser in question.
42. Significantly, as noted above, the overcharge effect at one level in the supply chain and the passing-on effect at the previous level are two sides of the same coin. Hence, they will offset each other and cancel out in terms of aggregate damages. This is illustrated schematically in **Figure 4** below.

What is pass-on and what are its effects?

Figure 4: Aggregate damages including an intermediate indirect purchaser



II. Case-law and legal framework

II.A. Introduction

43. Pass-on is a concept recognised in the Directive, as well as in certain prior national and EU case-law. It is consistent with general principles of tort law, including the principle that compensation should only be payable in respect of losses actually sustained and the need to avoid the unjust enrichment of claimants. It has also been cited in the context of the principle of *compensatio lucri cum damno*, which requires courts to take into account any benefits that a claimant may have obtained as a result of the loss.¹⁸
44. In EU competition damages law, pass-on finds its origin in the standing which has been recognised to indirect purchasers. Specifically, and in line with the jurisprudence of the Court of Justice of the European Union ("CJEU") in this area,¹⁹ the Directive provides that any person who has suffered harm caused by a competition law infringement may claim compensation for that harm. This includes direct and indirect purchasers of products or services affected by a competition law infringement.²⁰
45. Pass-on is intimately linked to the question of causation of harm²¹ and the possibility in many market situations that persons at different levels of the supply chain may have been negatively affected by an anti-competitive infringement. It is the principle which permits national courts to attribute harm caused by an infringement between the different levels of the supply chain that have been affected by the infringement; i.e. principally between indirect and direct purchasers which have co-existing standing to claim. It thereby forms a key aspect of achieving the EU law objective of full compensation: that is, that victims of competition law infringements should be compensated for actual damage suffered (direct loss, loss of profits and interest) – they should not be either over-compensated (where, for example, part of the harm has been passed on to a third party) or under-compensated (where, for example, pass-on of any overcharge may have generated loss of sales on the downstream market due to the consequent increase in prices).

¹⁸ See, for example Opinion of AG Mancini in *Pauls Agriculture v. Council and Commission*, C-256/81, EU:C:1983:91, paragraph 5.

¹⁹ Judgment in *Courage and Crehan*, EU:C:2001:465, paragraph 26; and judgment in *Manfredi*, EU:C:2006:461, paragraph 61.

²⁰ It also includes direct and indirect suppliers when the infringement of competition law relates to a supply to the infringer (Article 12(4) of the Directive).

²¹ As to which see Section V.A below.

46. Directive 2014/104/EU establishes the new legal framework for pass-on in the EU. The Directive, and its national implementing legislation, will become the main legal basis for adjudication of pass-on issues by national courts (together with the underlying *acquis communautaire*) as and when the Directive becomes effective.²² In [Section II.F](#) below we set out the principal terms of the Directive of relevance to pass-on, together with cross-references to the sections of the Study relevant to each of those provisions (see **Box 8**). In the following sections, we provide an overview of pre-existing case-law, legal practice and legislation relating to passing-on in the US and the EU, as follows: pass-on in the US in [Section II.B](#), CJEU case-law on pass-on in [Section II.C](#), the approach of national courts to pass-on in [Section II.D](#), and national legislation on pass-on in [Section II.E](#). It should be emphasised that this law and practice predates the Directive and its application in national antitrust damages actions in future cases where the Directive applies may have to be reconsidered in the light of the provisions of the Directive.

II.B. Pass-on in the US

47. The approach to pass-on in the EU and the Directive represents a key difference with the system for competition law damages established in the US.
48. On policy grounds, and as early as in 1968 and 1977, the US Supreme Court declared the allegation of pass-on inadmissible as a matter of Federal US antitrust law.²³ The Supreme Court reasoned that it would be too difficult to apportion damages down the entire distribution channel and thus only direct purchasers should be compensated. In 1989, the US Supreme Court held however that Federal antitrust law did not pre-empt State law from recognizing indirect purchaser standing.²⁴ As a result, some States have passed legislation or interpreted existing State law to allow indirect purchasers to bring damages actions.²⁵ These laws can result in duplicative

²² The Directive is to be implemented into national law by 27 December 2016 (Article 21(1)). Its temporal application is regulated by Article 22.

²³ See *Hanover Shoe, Inc. v. United Shoe Mach. Corp.*, 392 U.S. 481 (1968) ("**Hanover Shoe, Inc.**") and *Illinois Brick Co v. Illinois*, 431 U.S. 720 (1977) ("**Illinois Brick Co.**") (finding that only direct purchasers suffer antitrust injury and may sue for treble damages under § 4 Clayton Act). But see *In re ATM Fee Antitrust Litigation*, 686 F.3d 741 (9th Cir. 2012) ("**In re ATM Fee Litigation**") (citing the following as exceptions to the general rule because in these cases there is either no apportionment to be done or because if standing is not recognised infringers will be left undeterred: (i) pre-existing cost-plus contract (ii) co-conspirator exception (iii) ownership and control exception).

²⁴ *California v. ARC America Corp.*, 490 U.S. 93 (1989).

²⁵ See, e.g., *In re CRT Antitrust Litigation*, 2013 U.S. Dist. LEXIS 137945 (N.D. Cal. June 20, 2013) ("**In re CRT Litigation**") (citing the following States as States in which indirect purchasers may bring claims on the basis of State law: Arizona, California, District of Columbia, Florida, Hawaii, Iowa, Kansas, Maine, Michigan, Minnesota, Mississippi, Nebraska, Nevada, New Mexico, New York, North Carolina, North Dakota, South Dakota, Tennessee, Vermont, West Virginia, and Wisconsin). The law on whether and to what extent

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recovery where the direct purchasers and multiple levels of indirect purchasers are awarded damages based on the same underlying conduct in separate trials or settlement negotiations. There is currently a debate among practitioners and academics in the US as to whether Federal and State antitrust actions should be tried together and whether damages should be apportioned.²⁶

49. As antitrust infringers are not permitted to raise the pass-on defence as a matter of Federal law, pass-on theories are generally analysed in the context of indirect purchaser cartel damages actions. In indirect purchaser class actions, a representative purchaser brings an action on behalf of him or herself and other similarly situated individuals who allege they have been affected by a cartel, generally known as “the class”.²⁷ If the action is properly certified to proceed to trial as a class, the court’s judgment will bind the entire class except for those who were not adequately represented or decided to opt-out from the procedure.²⁸
50. The fact that pass-on generally arises in class action litigation and at class certification stage, results in some key differences with competition law damages actions in the EU:

indirect actions are allowed in certain States is still evolving, including through legislative action. See American Bar Association, ‘Indirect Purchaser Lawsuits: A State-by-State Survey’ (McCarthy et al. eds. 2010). A small number of States also permit State Attorneys General to bring *parens patriae* actions seeking damages on behalf of all indirect purchasers residing in their territory. See § 4C Clayton Act, 15 U.S.C. § 15c.

²⁶ For example, *Competition* (the Journal of the Antitrust and Unfair Competition Law Section of the State Bar of California) devoted in 2014 an entire issue of the journal to this topic with claimant and defence perspectives on questions like ‘Should Federal and State Class Antitrust Actions be tried Together?’ and ‘Should Damages Be Apportioned for Federal and State Antitrust Violations?’ *Competition* vol. 23, no. 2 (2014). Currently, it is up to each individual state to legislate (or decide via judicial order) how to handle the intersection of State and Federal antitrust actions. This has resulted in different approaches to this issue. While some States like Illinois and Utah direct courts to avoid duplicative recovery: Ill. Comp. Stat. 740 10/7(2); Utah Stat. § 76-10-919(7) & (8) (“*In an action by indirect purchasers, any damages or settlement amounts paid to direct purchasers for the same alleged antitrust violations shall constitute a defense in the amount paid on a claim by indirect purchasers under this chapter so as to avoid duplication of recovery of damages.*”); others like Kansas and Wisconsin do not, and do not allow pass-on to be raised by defendants. *Cox v. F. Hoffman-La Roche, Ltd.*, 2003 WL 24471996, at *3 (Kan. Dist. Ct. Oct. 10, 2003); *K-S Pharmacies Inc. v. Abbott Labs.*, 1996 WL 33323859, at *12 (Cir. Ct. Wisc. 1996). Yet other States, like California and New York, allow defendants to prove pass-on as an affirmative defence in actions where direct and indirect purchasers are involved. *Clayworth v. Pfizer, Inc.*, 49 Cal. 4th 758, 787 (2010); *In re TF-TLCD (Flat Panel) Antitrust Litigation*, 2012 WL 6709621, at *2 (N.D. Cal. 2012); N.Y. Gen. Bus. Law § 340(6). Further, some proposals, notably, the one made by the Antitrust Modernization Commission in 2007, have suggested that Congress should overrule the Supreme Court’s decisions in *Illinois Brick Co.* and *Hanover Shoe, Inc.* and allow for the full adjudication of such claims in a single Federal forum, (Antitrust Modernization Comm’n, Report and Recommendations, April 2007, available at http://govinfo.library.unt.edu/amc/report_recommendation/toc.htm).

²⁷ See generally Klonoff, Bilich and Malveaux, ‘Class Actions and Other Multi-party Litigation, Cases and Materials’ (West, 3d ed. 2011) at Chapter 1.

²⁸ See *Hansberry v. Lee*, 311 U.S. 32 (1940) (holding that extending *res judicata* effects on those who are not adequately represented is contrary to a due process guaranteed by the XIV Amendment of the USA Constitution).

- a) The pass-on analysis refers generally to the effects on an entire market level, as opposed to on a specific claimant. The available data provided in discovery is generally extensive, and the process is generally long, costly and burdensome for the entire industry affected by the wrongful conduct. Pre-certification discovery may take several months or years and, if certification is granted, merits discovery may take as long as 3-4 years. It is common for there to be an extensive use of subpoenas requesting transactional data and depositions, including of third parties who often bear their disclosure costs themselves.
 - b) Pass-on is generally analysed by the courts only as a threshold issue in the context of class certification. This is because, once certification is granted, many actions are settled. In determining whether to certify an indirect purchaser class, the focus is generally on expert methodology and the ability to prove class-wide injury with common evidence and a single method or formula.
51. In this sense, US case-law does not offer directly applicable judicial reasoning for use in the EU. On the other hand, given the depth of experience in antitrust damages actions, US cases and, above all, practice, are extremely helpful in providing additional insight and guidance in what is a nascent area in the EU and we refer where appropriate to such practice in the course of this Study.

II.C. CJEU case-law on pass-on

II.C.1. Introduction

52. The CJEU has had the opportunity to consider pass-on in a series of cases relating to the reimbursement of taxes or charges unlawfully levied in breach of EU law.²⁹ This case-law has, in turn, been cited with approval by the CJEU in the context of claims for recovery arising from breaches of competition law.³⁰ It has, further, been cited and applied by a number of national courts in their analysis of pass-on in the context of antitrust damage claims,

²⁹ See *inter alia* judgment in *Ireks-Arkady v. Council and Commission*, C-238/78, EU:C:1979:226; judgment in *Just*, C-68/79, EU:C:1980:57; judgment in *Amministrazione delle finanze dello Stato v. San Giorgio*, C-199/82, EU:C:1983:318; judgment in *Bianco and Girard v. Directeur général des douanes and droits indirects*, C-331/85, EU:C:1988:97; judgment in *Comateb and Others v. Directeur général des douanes and droits indirects*, C-192/95, EU:C:1997:12; judgment in *Dilexport*, C-343/96, EU:C:1999:59; judgment in *Michailidis*, C-441/98, EU:C:2000:479; judgment in *Lady & Kid and Others*, C-398/09, EU:C:2011:540.

³⁰ See judgment in *GT-Link v. De Danske Statsbaner*, C-242/95, EU:C:1997:376, paragraph 26.

including by the highest courts of Germany and Spain.³¹ The CJEU case-law (and the national case-law applying it) predates the Directive, however, and its application in national antitrust damages actions in future cases where the Directive applies will have to be reconsidered in the light of the provisions of the Directive. This case-law is, nevertheless, of relevance in the discussion of pass-on as a matter of EU law.³²

II.C.2. CJEU approach to pass-on

53. The CJEU recognizes that pass-on is a relevant consideration for courts in determining the level of harm suffered at different levels of the distribution chain. The principle was first evinced by the Court in *Ireks-Arkady*³³ and has since been consolidated by reference to the underlying rationale that the claimant should not receive more than its real harm and thereby be “unjustly enriched”. However, given that it constitutes a restriction on a right derived from the legal order of the European Union when it is used as a defence (that is, it is an exception to the EU law right to receive compensation for harm suffered as a result of a breach of EU law), the case-law has interpreted it in a restrictive manner.³⁴
54. So, for instance, the CJEU has established that, even if pass-on of costs may be considered normal commercial practice, no presumption of pass-on can be established.³⁵ Equally, the burden cannot be placed on the claimant to prove that pass-on has not taken place (whether as a matter of law or because the claimant is required to produce documentary evidence to this effect).³⁶ Such requirements would be contrary to the effective application of EU law.
55. Rather, **pass-on is a question of fact to be determined by the national court on the basis of a free assessment of the evidence adduced**

³¹ See Germany, Federal Court of Justice, KZR 75/10, German *Carbonless Paper*, judgment of 28 June 2011 (“**German Carbonless Paper (2011)**”); in Italy, Milan Court, 16319/2013, *Brennercom S.p.A. v. Telecom Italia S.p.A.*, judgment of 27 December 2013 (“**Brennercom v. Telecom Italia (2013)**”); and in Spain, Supreme Court in Case No. 5819/2013, *Nestlé and ors v. Ebro Puleva and ors*, judgment of 7 November 2013 (“**Spanish Sugar II (2013)**”). See further Section II.D below.

³² The Directive explicitly invokes the *acquis communautaire* at paragraph 12 of the Preamble.

³³ Judgment in *Ireks-Arkady v. Council and Commission*, EU:C:1979:226, paragraph 14.

³⁴ Judgment in *Weber's Wine World and Others*, C-147/01, EU:C:2003:533, paragraph 95; judgment in *Lady & Kid and Others*, EU:C:2011:540, paragraph 20.

³⁵ Judgment in *Comateb and Others v. Directeur général des douanes and droits indirects*, EU:C:1997:12, paragraph 25; judgment in *Weber's Wine World and Others*, EU:C:2003:533, paragraphs 96-97.

³⁶ Judgment in *Amministrazione delle finanze dello Stato v. San Giorgio*, EU:C:1983:318, paragraph 14; judgment in *Michailidis*, EU:C:2000:479, paragraph 36; judgment in *Weber's Wine World and Others*, EU:C:2003:533, paragraph 111.

before it following an economic analysis in which all the relevant circumstances are taken into account.³⁷

11.C.3. Evidencing pass-on

56. When addressing the means of proving pass-on, the CJEU and Advocate General opinions have emphasised their view that isolating the passing-on effect can be a difficult exercise and therefore requires a thorough economic analysis, given the large number of factors that may influence pricing.³⁸ So, for instance, a review of cost documentation or accounts are unlikely to be sufficient to capture all the factors on the basis of which price is determined (many of which are, in fact, extraneous to the price setter in question).³⁹
57. Advocate General Geelhoed (at paragraphs 73-80 of his Opinion in *Commission v Italy*⁴⁰, cited with approval by the CJEU in its judgment in the same case) analyses the economic factors which he considered relevant to the assessment of pass-on, highlighting *inter alia* the following factors:

73. It will first be necessary to examine whether a charge which increases prices is actually passed on in the price of a product. The fact that the price of the product is increased does not automatically mean that the price increase is directly connected with the charge imposed. In the light of the dynamic of market conditions and prices it is by no means certain as to what effect a charge will have on the level of a price. Prices of products are not static. In general producers regularly adjust their prices depending on the circumstances of the market. With the exception of the cost price, a trader will base his pricing policy *inter alia* on factors such as expectations concerning the development of the market and the position of a particular product on the market. A charge increasing the cost price is only one of the factors in determining the price. [...]

78. These considerations lead me to the conclusion that it will be virtually impossible to demonstrate the degree to which the economic burden resulting from the charge has been passed on. In order to do so it is necessary to conduct a thorough analysis of the market, taking into account a large number of variables such as the structure of the market concerned (more or fewer providers) and the availability of possible substitutes for the product affected by the charge. Account must also be taken of the fact that market conditions are dynamic in nature and that prices fluctuate according to changes in supply and demand. This makes it particularly difficult to establish what effect a charge has on the level of the retail price. In order to establish that effect it would ultimately be necessary to establish how the prices and the sales would have developed if no charge had been imposed.

58. On the question of how to evidence pass-on as a consequence, the Advocate General goes on to state:

³⁷ Judgment in *Weber's Wine World and Others*, EU:C:2003:533, paragraphs 96 and 100. Judgment in *Alakor Gabonatermelő és Forgalmazó*, C-191/12, EU:C:2013:315, paragraph 30.

³⁸ See: Opinion of AG Caporti in *Ireks-Arkady v. Council and Commission*, EU:C:1979:203; opinion of AG Mancini in *Pauls Agriculture v. Council and Commission*, EU:C:1983:91; opinion of AG Mancini in *Amministrazione delle finanze dello Stato v. San Giorgio*, EU:C:1983:247.

³⁹ See, for example, Opinion of AG Mancini in *Amministrazione delle finanze dello Stato v. San Giorgio*, EU:C:1983:247.

⁴⁰ Opinion of AG Geelhoed in *Commission v. Italy*, C-129/00, EU:C:2003:319.

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81. The foregoing also has consequences for adducing evidence. This must be aimed at establishing a large number of economic indicators from which it can ultimately be deduced that the recovery of the charges concerned would lead to unjust enrichment. It is obvious that such an analysis cannot be expected from the producer. In any event I note that it is insufficient merely to examine the accounts to prove that an amount has been passed on and that there has been the alleged enrichment resulting therefrom. This is also the conclusion dictated by the case-law of the Court. [...]

83. Therefore, in the light of the economic principles set out above, it will not be possible to establish whether and to what extent there has been enrichment as a consequence of the recovery of charges paid but not due until a thorough economic analysis has been made of the market concerned.

59. A further point is raised by the Advocate General's statements. The measurement of pass-on must take account of what the price setter would have done *in the absence* of an overcharge.⁴¹ That is, to prove the defence, the defendant must demonstrate to the requisite legal standard that the price would have been different (i.e. lower) without the overcharge (and that the merchant would not have applied the price it actually applied anyway). To this end, a counterfactual would be required to show what would have occurred to prices in the absence of the overcharge.⁴²

II.C.4. Volume effects

60. Finally, the CJEU has constantly underlined the need for defendants not only to prove the extent to which pass-on has reduced actual losses to the claimant, but also to factor in any loss of sales profit to the claimant caused by that pass-on (what we have elsewhere called the "volume effect"). Accordingly, where pass-on is used as a defence, the national court's analysis of harm should include a consideration of the negative impact of any passing-on of the unlawful overcharge through higher sales prices on the claimant's sales volumes (and therefore profit) in the downstream market where it sells.⁴³
61. The CJEU's requirement to take into consideration the volume effect is linked to the principle of unjust enrichment which underlies the CJEU's reasoning in this line of cases. According to this principle, for the pass-on defence to succeed, the defendant should show that awarding damages would result in

⁴¹ Opinion of AG Geelhoed in *Commission v. Italy*, EU:C:2003:319, paragraph 77. This was one of the reasons why the US Supreme Court rejected as a matter of US Federal Antitrust Law the possibility to raise pass-on theories in damages actions. *Hanover Shoe, Inc.*: "Even if it could be shown that the buyer raised his price in response to, and in the amount of, the overcharge and that his margin of profit and total sales had not thereafter declined, there would remain the nearly insuperable difficulty of demonstrating that the particular plaintiff could or would not have raised his prices absent the overcharge or maintained the higher price had the overcharge been discontinued."

⁴² If it can be satisfactorily proven or assumed that pass-on rates will be constant in all events (i.e. with or without the overcharge) then the pass-on effect may be obtained using the estimate of the overcharge multiplied by that pass-on rate; see [Section IV.B.1.1](#) below.

⁴³ See: Judgment in *Comateb and Others v. Directeur général des douanes and droits indirects*, EU:C:1997:12, paragraphs 29-32; judgment in *Michailidis*, EU:C:2000:479, paragraphs 34-35; judgment in *Weber's Wine World and Others*, EU:C:2003:533, paragraphs 98-99.

unjust enrichment to the claimant; and this should include consideration not only of direct overcharge harm (i.e. that which has not been passed on but has been absorbed by the claimant) but also of the harm resulting from the volume effect.

II.C.5. Conclusion

62. The foregoing overview of the CJEU's case-law on pass-on - developed in the context of claims for the reimbursement of taxes unlawfully levied prior to the adoption of the Directive - illustrates the Court's perception at the time of the difficulties of assessing pass-on and its view that a thorough economic assessment will generally be necessary to measure its existence and extent. Methods for carrying out such economic assessment, offering a range of possible solutions for courts and experts to quantify the effects of pass-on, are the subject of this Study (see, in particular, [Sections III and IV](#)).

II.D. The approach of national courts to pass-on

63. Pass-on has been addressed in only a very few national cases in the EU.⁴⁴ As such, there remains a dearth of jurisprudence on the analysis and quantification of pass-on by courts at national level. Moreover, these cases all pre-date the Directive and certain approaches will need to be reassessed in future cases, for instance as regards legal presumptions and burdens of proof. Nevertheless, precisely because judicial experience in relation to the issue is so limited, it is useful to identify the key themes that come out of the existing cases and the approach taken to assessing evidence related to pass-on so that national judges can, where appropriate, draw on that experience.

II.D.1. Application of pass-on – “defensive” and “offensive”

64. Pass-on has been used as both a “sword” and as a “shield” by parties in litigation in the EU. By “sword” we refer to the situation where a claimant alleges that there has been upstream pass-on of an overcharge which has caused it harm. By “shield” we refer to the situation where a defendant

⁴⁴ As part of this project, Cuatrecasas, Gonçalves Pereira, with the support of its Subcontractors, has conducted a thorough analysis of national case-law as it relates to the issue of pass-on in all the EU Member States during at least the last 10 years prior to the date of writing. A statistical analysis of the findings can be found at [Annex B](#). In this section, we provide an overview of the approach of national courts to pass-on. Further details of individual cases are described during the course of this Study by reference to the particular issues to which they are relevant or offer examples. The Study also includes insight from a number of competition law damages cases which were still pending before national courts at the time of writing or which have been settled without a judgment on the merits, where we have direct knowledge of the arguments employed on pass-on or have obtained insight from discussions with certain stakeholders (judges, economists and legal practitioners).

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alleges that there has been downstream pass-on by a claimant which reduces its harm (in terms of actual loss). Pass-on has been used significantly more frequently as a shield, as a defence to damages claims made by direct (or sometimes indirect) purchasers, than as a sword in indirect purchaser claims.⁴⁵

65. There is, however, a growing trend of indirect purchaser actions which must, inherently, include upstream pass-on as part of the basis for their claim to have suffered harm. In some cases, upstream pass-on may arguably be more straightforward (e.g. where indirect purchases are realised through subsidiaries,⁴⁶ agents or intermediaries of cartelists) or may be based contractually or otherwise on the relevant cartelized cost.⁴⁷ In others, it may be a particularly key issue in evidence, such as in *German Car Glass* (2015)⁴⁸ (see **Box 3** below). It should be noted, in this context, that the Directive establishes a presumption of pass-on to indirect purchasers, where certain minimum conditions are met, which is likely to facilitate indirect purchaser claims.⁴⁹

Box 3: German Car Glass (2015)

Regional Court Düsseldorf, 14d O 4/14, German Car Glass, judgment of 19 November 2015.

A follow-on action was brought by motor insurance company, HUK-Coburg, against members of the Car Glass Cartel, which was found to have infringed competition law and was fined by the Commission in November 2008 in connection with the supply of glass to the OEM (car manufacturer) market in the EEA.

The claimant argued that replacement car glass was also affected by the Cartel and suffered an overcharge. The claimant took the view that the insurance companies are to be considered as indirect purchasers, given that their clients (the insured) purchased car glass from repair shops who in turn purchased replacement car glass directly from OEM car manufacturers or indirectly from the car glass producers (via wholesalers). The claimant alleged that the overcharge on the replacement glass had been passed on to the repair shops upstream by their suppliers and then to the insurance companies, given that the insured had their cost covered by insurance, such that the claimant and other insurance companies bore the alleged overcharge.

⁴⁵ Of the 71 court decisions reviewed in the preparation of this Study, the pass-on theory was raised as a defence on 53 occasions, 12 times as part of an indirect purchaser claim and 6 as both.

⁴⁶ This is, in fact, one of the express situations in the US where the standing of direct purchasers is still recognized as such ("ownership and control exception"; as per *In re ATM Fee Litigation*). See also the position of the German Federal Court in **Box 4** below.

⁴⁷ By way of example of a case where upstream pass-on is argued in this way, note the MIF Litigation. Multilateral Interchange Fees (MIFs), which are the object of litigation in the UK, Austria and Belgium concerning harm allegedly caused by these fees to merchants in their payment of inflated Merchant Service Charges (MSCs) to acquiring banks, have been argued to be passed on to merchants given the way MSCs can be set contractually, as well as statements to this effect by the European Commission, *inter alia*, in its Decision of 19 December 2007 (COMP/34579). See, further, [Section IV.A.3.2](#) below.

⁴⁸ Regional Court Düsseldorf, 14d O 4/14, *German Car Glass*, judgment of 19 November 2015 ("**German Car Glass (2015)**").

⁴⁹ Article 14(2) of the Directive.

The Court dismissed the claim. While recognising that – for the case at hand – it might be assumed that the Cartel inflated sales prices vis-à-vis the direct OEM purchasers, the Court concluded that the claimants had failed to demonstrate sufficiently that there was any causal link between the cartel behaviour in the OEM market and the pricing of replacement glass by car manufacturers. This was particularly the case considering the very substantial price mark-ups charged by the car manufacturers for replacement glass (as compared with the prices charges in the OEM market for the same glass), which the claimants had not adequately explained.

The claimants' expert carried out an analysis of the price developments in both the replacement and the OEM (car manufacturer) markets before, during and after the Cartel period to try to establish a correlation. This was done using publically available price data since the claimant did not have access to data from the car manufacturers (who were not parties to the proceedings). No multivariable regression or correlation analyses were run; rather, the claimants sought to establish a link between the cartelised product prices and the replacement glass prices through the observation of pricing patterns on the two markets. The Court considered, however, that this analysis failed to evidence sufficiently any direct causal link between the pricing at the OEM level and the way pricing functioned in the replacement glass market. In the absence of this causal link, there was insufficient evidence of pass-on effects (causal relationship) and, in fact, no work on the estimation of pass-on levels was required or performed.

Following the Federal Court ruling in German Carbonless Paper (2011), the Court clarified that: (i) the burden was on the claimant to prove passing-on; and (ii) there existed no general presumption of pass-on: the claimant had to evidence that there was a direct causal link between the Cartel and any price increase and must rule out any such increase having been caused by other factors. In particular, such other factors might include: price elasticity of supply and demand; the duration of the Cartel; and/or the intensity of competition at the direct purchaser level.

This ruling is pending appeal before the Higher Regional Court of Düsseldorf.

11.D.2. General approach

66. With a few exceptions, the limited case-law that has entered into the merits of pass-on in the EU has not done so with the assistance of economic experts, or if it has, quantitative analysis has not been carried out. The assessment of pass-on has generally been restricted to what one might classify as threshold questions around the likelihood of pass-on having occurred. Where experts have intervened, they have generally relied on insights from economic theory to argue for or against the existence and extent of pass-on and have sought to support their contentions with publicly available documentation such as market study reports and the particular characteristics of the market in question.⁵⁰

⁵⁰ See, for example, Appeals Court of Paris, Case No. 10/18285, Case No. 10/18285, *DOUX v. Ajinomoto & CEVA*, judgment of 27 February 2014 ("**DOUX Aliments (2014)**"), First Instance Court of Valladolid, Case No. 248/2009, *Galletas Gullón & ors v. Acor*, judgment of 20 February 2009, *Spanish Sugar II* and Maritime and Commercial Court, Case no. U-4-07, *Cheminova A/S v. Akzo Nobel Functional Chemicals BV and Akzo Nobel Base Chemicals AB*, judgment of 15 January 2015 ("**Cheminova (2015)**").

67. Rules on burden of proof and the use of presumptions have also played an important role. Some courts have imposed the burden of proof on the claimant to prove the absence of downstream pass-on.⁵¹ A number of national courts have held that pass-on is likely to occur under normal market conditions such that this has operated as a *de facto* presumption of downstream pass-on by the claimant.⁵² Such positions, where it is applied to the pass-on defence (downstream pass-on), will need to be revised in light of the Directive.⁵³
68. In other cases, courts have expressly rejected a presumptive approach to pass-on and have, instead, advocated that cases be assessed on their individual merits and facts. So, for instance, the German Federal Supreme Court held in *German Carbonless Paper* (2011) (as further described in **Box 4** below) that a defendant in Germany would have to prove each of the following three elements to plead successfully the passing-on defence:
- a) the increase of price by the claimant to its clients was due to the passing-on of the damage and not to any other circumstance;
 - b) the pass-on was economically plausible in light of the particular market dynamics in question (including elasticity of demand, price evolution and product characteristics); and
 - c) the claimant had not suffered any other economic disadvantage, as, for example, the reduction of its sales due to the increase of the price.
69. This third element (c) is the so-called volume effect and forms part of the claimant's loss when pass-on has occurred. The existence of this effect is consistent with CJEU case-law (and economic theory) and is important to highlight. At the same time, however, we should note that the approach of conditioning the success of the pass-on defence on proving the inexistence of a countervailing volume effect (such that unjust enrichment to the

⁵¹ See, for example, French cases such as *DOUX Aliments* (2014) and judgment of 16 February 2011 of the Appeals Court of Paris, Case No. 08/08727, *Le Gouessant v. Ajinomoto & CEVA* ("**Le Gouessant (2011)**").

⁵² See, in particular: *Le Gouessant* (2011); judgment of 28 January 2014 of the Higher Regional Court of Karlsruhe, 6 U 183/03, *Vitamin Prices* (but note the subsequent jurisprudence of the Federal Court of Justice contradicting this approach in *German Carbonless Paper* (2011)); the judgment of 13 September 2013 of the Italian Supreme Court, 21033/2013, *Libralon S.r.l. e Studio Elle S.r.l. v. Agenzia del Territorio*; and the judgment of 3 October 2011 Appeals Court of Madrid, Case No. 370/2011, *Nestlé & ors v. Ebro Puleva and ors* ("**Spanish Sugar II (2011)**") (overturned on appeal before the Spanish Supreme Court).

⁵³ Article 13 establishes that defendants hold the burden of proof to prove the pass-on defence and Article 14 that indirect purchasers have the burden to prove that overcharges have been passed on to them. Conversely, Article 14(2) establishes a presumption of pass-on to indirect purchasers when certain conditions are met.

claimant can be established) may arguably need to be reconsidered in future cases where the Directive applies.⁵⁴

Box 4: German Carbonless Paper (2011)

Federal Court of Justice, KZR 75/10, German Carbonless Paper, judgment of 28 June 2011.

The printing company ORWI brought a follow-on action against a member of the EU Carbonless Paper Cartel, SD Papier, following the European Commission's decision of 20 December 2001. Technically, the claimant was an indirect purchaser in that the cartelists distributed the cartelized paper products through wholesalers. However, in the case at hand the respective wholesaler was a 100% subsidiary of the defendant cartel.

The German Federal Court overruled the findings of the lower courts (Regional Court Mannheim (22 O 74/04, 2005) and Higher Regional Court Karlsruhe (6 U 118/05 (Kart.), 2010)) that only direct purchasers would be entitled to claim damages and found that, on the contrary (and with reference to the CJEU jurisprudence in *Courage* and *Manfredi*) competition law required that indirect purchasers be entitled to claim damages, in particular because in many cartel cases it was precisely the indirect purchasers who actually suffered the damage.

The Federal Court held further that: (i) the concept of *Vorteilsanrechnung*, which largely equates to the passing-on defence, has always been an instrument of German law in respect of civil liability and has not been recently introduced in the framework of cartel damages claims; (ii) both direct and indirect purchasers are principally entitled to claim damages, the indirect purchasers bear, however, the burden of proof in respect of the passing-on and no presumptions apply; (iii) the passing-on defence is admitted as a matter of law but is limited to the inflated prices (i.e. the overcharge) and does not exclude damages suffered as a result of consequent reduced volume effects; (iv) the defendant bears the burden of proof in respect of the passing-on defence and no presumptions apply.

II.D.3. Reliance on public enforcement agency findings

70. There are also cases where parties have sought to rely on findings of competition authorities to demonstrate the existence of pass-on.⁵⁵
71. In *Arkopharma* (2006), the Commercial Court of Nanterre in France followed a similar approach to the later Appeals Court ruling in *Le Gouessant* (2011). After finding that the cartel caused an industry-wide overcharge which

⁵⁴ Pursuant to Article 12(3) of the Directive, the right of a claimant to claim compensation for loss of profits due to full or partial downstream passing-on is recognised as a separate head of damage. The way in which the different heads intrinsically relate to one another and are, in practice, calculated, may blur a distinction to some degree in practice, as can be seen in some of the methods for calculating the effects of pass-on described in [Section IV.A](#) below. For the CJEU's position on this issue and the underpinning principle of unjust enrichment in its previous case-law, see [Section II.C.4](#) above.

⁵⁵ See, for instance: judgment of 26 February 2015 of the Brussels Court of Appeal, Case No. 1639/2015, *Belgacom SA v. Base Company SA and Mobistar SA*; judgment of 11 May 2006 of the Commercial Court of Nanterre, Case No. 2004FO22643, *Arkopharma v. Group Hoffmann la Roche*, ("**Arkopharma (2006)**") ; judgment of 21 November 2012 of the Metropolitan Court of Budapest, Case No. 22.G.41893/2009, *Showtime Budapest v. Ticketpro* ("**Showtime (2012)**") ; and *Spanish Sugar II* (2011).

affected all direct purchasers (and therefore was likely to be passed on), the Court referred to the European Commission's findings in its Vitamins decision as to the impact of the cartel on the market and on consumers to support the conclusion that passing-on to the consumers was likely to have occurred. In *Showtime* (2012), a Hungarian follow-on damages action, a Metropolitan Court also cited paragraphs of the Hungarian NCA vertical restraint decision to support its finding of pass-on.⁵⁶

72. In *Spanish Sugar II* (2011), one of the factors that the Appeals Court of Madrid took into account when making a presumption of pass-on of the overcharge on industrial sugar were the references contained in the Spanish NCA decision concerning the impact of the cartel on both the industry and "ultimate consumers". The court gave weight to this statement as a factor in its finding of pass-on. On appeal, the Spanish Supreme Court rejected such an approach, finding that issues relating to the existence and quantification of pass-on are within the exclusive jurisdiction of civil courts. The Court's statement in this regard is of interest:

On [pass-on], the final judgement delivered in the administrative proceedings does not have binding effects. All the observations made by the Tribunal for the Defence of Competition, the National High Court and the Supreme Court about this matter are inconclusive. Both appellants and the respondents decontextualize some isolated expressions of the resolutions and purport to use them to support their respective theses, but their allegations in this regard are inconsistent. On the other hand, this is logical because the jurisdiction of the administrative authority and of the administrative law courts that heard the Decision's appeals did not cover the pass-on of the harm of the direct purchasers to their clients, that is, to issue its decisions the administrative law courts, and the Tribunal for the Defence of Competition, did not have to decide who exactly had suffered the damage and to what extent. This issue is an exclusive competence of the civil jurisdiction. (Our translation and emphasis).

73. The Court nevertheless implicitly acknowledged that investigations may contain findings as regards market dynamics, etc., which may contribute to the analysis carried out by the civil court.
74. In these cases, courts have generally based their rulings, not on detailed pass-on analysis undertaken by the competent competition authorities, but rather on general statements in relation to the existence of, for example, industry-wide overcharge or the supposed impact of cartels on the ultimate consumer. Without prejudice to the binding effect of competition authority decisions and the potential usefulness of market analysis contained in such decisions,⁵⁷ the weight that can be granted to such findings has to be properly qualified and contextualized, noting, as the Spanish Supreme Court

⁵⁶ When rendering the judgment, the Hungarian Court took account of the statements contained in paragraphs 160 and 165 of the decision of the Competition Council, according to which the competition law infringement leads to a price increase and the commission will ultimately be reflected in the consumer price, i.e., it results in higher prices for consumers.

⁵⁷ See in this regard *Spanish Sugar II* (2013) and judgment in *Otis and Others*, C-199/11, EU:C:2012:684, paragraph 66.

did in *Spanish Sugar II* (2013), that the assessment of whether and to what extent pass-on has occurred and a person has suffered recoverable damage to the requisite legal standard is a matter lying within the exclusive jurisdiction of civil courts.⁵⁸

II.D.4. Factors relied upon in assessing pass-on

75. When entering into the substance of pass-on arguments, some of the specific factors which EU national courts, and parties, have particularly considered include: (a) the importance of market dynamics and supply and demand elasticities; (b) firm v. industry-wide overcharges; (c) proportion of overcharge cost in the overall production of a product or service; and (d) customer buying power. We deal with each of these briefly in turn with reference to relevant national cases.
76. **The importance of market dynamics and supply and demand elasticities.** Consistent with CJEU practice, a number of national court rulings have underlined the importance of considering market dynamics in the assessment of pass-on, including in particular supply and demand elasticities and the intensity of competition. This was the position evinced by the German Federal Supreme Court in *German Carbonless Paper* (2011) already referred to, where the Court stated:

[I]t is a prerequisite of the 'adjustment of profits' that the price increase, which the victim can pass through to its own customers, has an adequate causality relationship with the price increase resulting from the cartel (...) In order to successfully contend the existence of 'adjustment of profits', the defending cartel must state plausibly in the first place, and by reference to the general market conditions in the relevant market, particularly the elasticity of demand, the development of prices, product characteristics, that the passing-on of the price increases resulting from the cartel can, at least seriously, be taken into consideration.⁵⁹ It follows to demonstrate and, where appropriate, prove that the passing-on does not entail any disadvantage for the purchaser, in particular no loss of sales, through which the price increase (either fully or partially) is offset. The cartel also has to demonstrate, if appropriate, how the own proportion of added value of the reselling purchasers had an impact on the 'adjustment of profit'/'adjustment by benefit' - as is the present dispute, in which ORWI has not resold the carbonless paper unaltered, but including printed forms.⁶⁰ (Our translation)

77. This position was followed by the Regional Court of Düsseldorf in its 2015 ruling in *German Car Glass* (2015), where it stated:

So it is possible that the power of the upstream purchaser to set prices does not depend on the market conditions resulting from the cartel, but on other independent, relevant market conditions or circumstances in the aftermarket. In such a case, the upstream purchaser would have been in a position, independently of the increased acquisition price,

⁵⁸ See further the discussion in [Sections V.B](#) and [V.E](#) below.

⁵⁹ Please note the important discussion of elasticity of demand curvature, as opposed to elasticity of demand, in [Section III](#) below.

⁶⁰ *German Carbonless Paper* (2011), paragraphs 59 and 69.

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to raise its own selling price.⁶¹ Among the factors that are relevant in this context are included the elasticity of supply and demand, the duration of the infringement as well as the intensity of competition at the same market level. If most of the suppliers at that level pay the cartel price and their trading partners have none or limited alternatives, then a transfer of costs may as a matter of principle result from the cartel, when competition in the aftermarket is otherwise functional.⁶² (Our translation)

78. Difficulties have in some cases been raised as to the feasibility of adequately detecting the existence and extent of pass-on of particular cost changes where prices respond principally to other key market drivers.⁶³
79. **Firm-specific v. industry-wide overcharge.** In line with general economic theory, the consensus in existing case-law appears to be that the greater the number of parties affected, the greater the likelihood of pass-on. In the French case *Arkopharma* (2006), for example, the fact that overcharges were imposed by a cartel that involved 80% of the producers of certain vitamins was considered evidence that all or almost all direct purchasers were subject to them and that they had, or could have, passed them on.⁶⁴
80. Other courts have considered the circumstance that only one or a few groups of companies have been affected by the overcharge to be a factor which evidences the inexistence of pass-on.⁶⁵ In Denmark for instance, in *EKKO* (2002),⁶⁶ a court found an absence of pass-on when a company subject to an overcharge was the only one affected in the market and its market share amounted to 2%. In Spain, the Supreme Court in *Sugar Cartel II* (2013) expressed doubts as to the Appeals Court finding that pass-on had occurred because the claimants faced competition from overseas companies that were not subject to the Spanish Sugar Cartel. The Court found the claimants' statements in this regard persuasive and they were, furthermore, supported

⁶¹ Please note that economists draw a distinction between ability to raise prices and incentives. See [Section III](#) below.

⁶² *German Car Glass* (2015), paragraph 221.

⁶³ See, for instance, Commercial Court of Madrid, Case No. 140/2013, *SEGA v. Repsol*, judgment of 19 June 2013 and *DOUX Aliments* (2014), **Box 32**. This is also an issue in dispute in the ongoing MIF Litigation and, in particular the *Sainsbury's MIF Litigation* before the CAT on which judgment was expected shortly at the time of writing (see **Box 21** in [Section IV.A](#) below).

⁶⁴ It is worth noting, however, that the French court did not dismiss the action on the basis that pass-on had in fact occurred. Rather, it found that because all direct purchasers were subject to the overcharge, none of them was disadvantaged *vis-à-vis* its competitors. Therefore, if *Arkopharma* decided to absorb the overcharge, this was due not to the cartel but to its own commercial decisions. This ruling was not appealed.

⁶⁵ See, for example, *DOUX Aliments* (2014) (**Box 32** below) and *Brennercom v. Telecom Italia* (2013).

⁶⁶ Judgment of 3 October 2002 of the Maritime and Commercial Court, Case no. V 15/01, *EKKO A/S v. Brandt Group Norden A/S, AM Hvidevarer A/S, GRAM A/S*, ("**EKKO (2002)**"), **Box 20** below.

by findings contained in the NCA decision on the importance of exportation for the industry (see **Box 5** below).^{67,68}

Box 5: Spanish Sugar II (2013)

Supreme Court, Case No. 5819/2013, Nestlé and ors v. Ebro Puleva, judgment of 7 November 2013.

A group of direct purchasers active in the food market brought a follow-on damages action in Madrid against an industrial sugar manufacturer who had, according to the NCA and judicial review courts, participated in a cartel (the Spanish Sugar Cartel) which fixed prices and allocated customers in Spain between 1995 and 1996.

The defendant raised the pass-on defence. The facts and evidence alleged in this regard were the following:

- The Ministry of Agriculture reported that confectionary product prices in Spain decreased 3.6% in 1995 and 6.3% 1996 and increased in 1997 up to 9.9% in supermarkets and 26.9% in traditional retail stores.
- Sugar represented up to 75% of the costs of certain pastry products.
- The trade associations (of which some of the claimants were members) had admitted in the administrative proceedings that their members had to pass-on the artificial cost increase caused by the Cartel thereby losing competitiveness and reputation in the market.
- The NCA decision contained a statement affirming that the cartel caused damage to both the confectionery industry and final consumers.

The First Instance Court rejected the pass-on defence, holding that the defendant did not prove pass-on because this could not be inferred from the Ministry's report. The Court also rejected the allegation that the claimants had admitted the existence of pass-on.

The Appeals Court however reversed this ruling, holding that pass-on should have been presumed from the 1997 price increases because: (i) sugar represented up to 75% of the costs of some confectionery products; (ii) the evidence necessary for the pass-on analysis (invoices) was no longer retained by the claimants; and (iii) the references contained in the NCA decision indicated that pass-on had occurred (including declarations by the claimants' trade association).

The Supreme Court finally reversed the Appeals Court decision on pass-on, finding that the defendant had failed to meet its burden of proof. The Court held that to prove pass-on it is not only necessary to prove price increases, as the defendant had done, but also the absence of volume effects. The Court reasoned that this is because pass-on does not just refer to the mere transfer of overcharges but to the transfer of loss which comprehends both the overcharges and lost sales. The Court noted that the defendants' expert report had not addressed pass-on and that only the transfer of overcharges had been accredited. In its judgment, the Court pointed to evidence in the administrative case file which indicated that the Cartel had affected the industry's competitiveness vis-à-vis foreign competition. In its view, this circumstance made it "hard" to conceive that the claimants could have passed on their loss.

⁶⁷ The Supreme Court noted: "In addition, it was the Tribunal for the Defence of Competition's Decision itself which affirmed that this price increase affected the competitiveness of the Spanish confectionary industry, damage that was especially serious because of the intense export activity of this industry, which evidences that hardly could the "passing-on" occur, that is the downstream pass-on of the loss". (Our translation).

⁶⁸ Please note the discussion of firm-specific charges in [Section III.B.2](#) below.

81. **Proportion of cost in the overall production of a product.** Some court rulings and legal practice suggest that the larger the proportion of the input cost of a product affected by an overcharge in the end product price, the higher the likelihood that a court will be prepared to find that an overcharge has been passed on, and vice versa (i.e. the less material the cost, the lower the likelihood of passing-on being found).⁶⁹
82. So, for instance, the Spanish Appeals Court in *Spanish Sugar II* (2011) considered the fact that industrial sugar represented approximately 75% of the input cost for certain confectionery products manufactured by the claimants was persuasive in determining that pass-on had occurred - albeit, as we have seen, this position was rejected by the Supreme Court, *inter alia*, on the ground that the overcharge only affected Spanish manufacturers and not their foreign competitors (see **Box 5** above).
83. In *DOUX Aliments* (2014), a French case relating to the Lysine Cartel, the Court of Appeal, on remission from the *Cour de Cassation* found that pass-on of the overcharge on lysine had not, in fact, occurred between poultry producers and supermarkets. In this case, the overcharged lysine only represented 1% of the overall cost of the chickens sold by the claimants. Agreeing with the allegations made by the claimant and its expert, the court concluded that it was unlikely that a 30% increase in an input cost representing only 1% of the total could be used as a reason by them to modify their chicken prices.⁷⁰
84. The lower Commercial Court of Paris had taken a different approach to that seen by the Court of Appeal in *DOUX Aliments* (2014) in the earlier case of *Juva* (2007).⁷¹ In this case, which related to the Vitamins Cartel, the Commercial Court considered vitamins to be such a small part of the finished good that Juva could offset any price increase in vitamins by raising its own prices. Indeed, the court noted that the price of Juva's supplements had, in fact, increased by more than the prices of the vitamins.⁷²

⁶⁹ This issue arises and can be a relevant issue in US competition litigation. See *In re Optical Disk Drive (ODD) Litigation*, Case No. 3:10-md-02143, Dkt. 1444 (N.D. Cal. Oct. 3, 2014). ("In re Optical Disk Drive Litigation") referred to in [Section IV.B.1.1](#).

⁷⁰ Another key consideration in this case was the existence of buyer power (see below) and the way in which prices were set in the particular market in question. This case is further considered below in [Section IV.A](#), **Box 32**.

⁷¹ Commercial Court of Paris, Case No. 2003048044, *Juva v. Group Hoffmann la Roche*, judgment of 26 January 2007 ("**Juva (2007)**").

⁷² For further discussion of overcharges affecting small input costs see [Section IV.B.1.1](#), for example.

Box 6: Juva (2007)

Commercial Court of Paris Case No. 2003048044, *Juva v. Group Hoffmann la Roche*, judgment of 26 January 2007.

Juva, a producer of food supplements, brought a follow-on damages action against Hoffmann la Roche claiming damages for the harm suffered as a result of the Vitamins Cartel sanctioned by the European Commission. Juva claimed that, but for the cartel, it would have obtained higher profit margins. Confronted with the pass-on defence Juva claimed that it had not raised its prices during the cartel period. In addition, it argued that in a market-based economy prices are always fixed to maximize the level of sales. Therefore, if it had increased its prices, this would have resulted in a consequential reduction in its sales volume.

Holding that “*reality contradicted the economic theory relied on by Juva*” the Court dismissed Juva’s action finding that:

- i) Juva was wrong in presenting its economic rule as incontestable (i.e. pass-on leads to reduction of sales volumes). The court cited as an example non-interchangeable products, or products of first necessity, such as health products, which have nil demand elasticity and therefore their sales volumes do not decrease with price increases;
- ii) As a matter of fact, Juva had actually increased its prices and this had not resulted in a reduction of its sales volume. The Court found that between 1990 and 1994 15 tablet box prices had increased annually by 10.25%, 0%, 5.42% and 4.41% respectively and had increased its sales volumes by a 100% over the four year period. The Court also found that prices for 30 tablet boxes had increased annually by 7.6%, 1.48%, 8.86% and 1.38% and sales volumes had increased 500% over the four year period;

Based on information provided by Juva, vitamins were a small cost component and therefore any overcharge could easily be offset with a small price increase of the finished good. As an example, the Court noted that vitamin C represented just 2.6% of the cost of a box containing 15 tablets and 4.1% in the case of a box containing 30 tablets.

85. **Buying power.** Courts have considered buying power a relevant factor for the passing-on analysis. If purchasers of cartelized products or inputs face strong buyers, some courts have considered it highly likely that those downstream purchasers will be able to resist price increases or, conversely, that suppliers will not be able to pass on cost increases.
86. This was the situation, for example, in *DOUX Aliments* (2014) where supermarkets were held to exert buyer power and this, together with the other characteristics of the market in question, was judged to have made pass-on unlikely.^{73,74}

II.D.5. Other factors influencing the approach of courts

87. A number of other important factors have influenced the way in which practitioners and courts have approached pass-on to date. Some of these

⁷³ Buyer power is also an issue which is often raised in US litigation where the ability of buyers to resist prices increases can be evidenced by witness testimony.

⁷⁴ For further discussion of buyer power, see [Section III.B.6](#) below.

relate to evidentiary issues, such as: (a) the difficulties of accessing evidence; and (b) the relevance of qualitative “non-technical” evidence. These are considered briefly below.

88. **Difficulties of accessing evidence.** Obtaining relevant evidence to prove pass-on, when such evidence is in the hands of the counter-party, or even of third parties, raises real challenges. Even where disclosure is available, as in the UK, there may be limited relevant information available. For example, the facts may pertain to periods well before any civil litigation is started (cartels are frequently of long duration and their sanction may post-date the end of the infringement by considerable periods). The Danish case of *Cheminova* (2015)⁷⁵ seems to have been a case in point and, as a result, the judicially-appointed expert resorted to insights from economic theory and reference to market studies to reach his conclusions on pass-on.⁷⁶ Meaningful economic analysis and, in particular, econometric exercises may also require a level of detail in the information which is not always available. The difficulties and solutions that can be used to address data access and availability in economic analysis are considered further in [Section IV.C](#) below, and [Section V.C](#) addresses the opportunities afforded by the new disclosure requirements in the Directive.
89. **Qualitative “non-technical” evidence.** Factual evidence relating to how prices are set and costs considered is important in assessing pass-on and, to date, has been granted significant weight by courts. Such qualitative evidence may relate to contractual arrangements or to price regulation, for example.⁷⁷ One downstream pass-on example took place in the Italian case of *Unimare* (1999).⁷⁸ There, the Cagliari Court of Appeal found that any harm suffered by the claimant as a result of allegedly excessive airport tariffs had been passed on by virtue of the contract that the claimant had with its customer and which imposed the obligation to reimburse any fees paid including any increase thereof. Qualitative evidence may also, in particular, relate to business testimony and practice as to how prices are set by companies.⁷⁹

⁷⁵ *Cheminova* (2015).

⁷⁶ See **Box 23** below in [Section IV.A.3.2](#).

⁷⁷ Cases relating to the impact of price regulation include, in particular, the Gas Insulated Switchgear Cartel litigation in the UK (*National Grid*).

⁷⁸ See Cagliari Court of Appeal, *Unione Agenti Marittimi - Unimare S.r.l. v. Gestione Aeroporti Sardegna – Geasar S.p.A.*, judgment of 23 June 1999. Note, however, that in CJEU jurisprudence, even the requirement to include VAT in downstream invoices may not be sufficient to accredit pass-on (see *Weber’s Wine World*, EU:C:2003:533, paragraph 114).

⁷⁹ See, for instance, *Cooper Tire & Rubber Company Europe Ltd & Ors v. Dow Deutschland Inc & Ors* [2010] EWCA Civ 864 (“**Cooper Tire (2010)**”), referred to further at [Section IV.A](#) below.

II.D.6. Judicial policy considerations

90. Other factors which have been taken into account by national courts relate to what might be termed more judicial policy objectives: (a) the objective of not allowing infringers to get away with the consequences of their infringements; and (b) the fact that the pass-on of the overcharge may have caused loss of sales to the claimant and, therefore, harm. It should be emphasised that these cases pre-date the Directive and the impact of the Directive will need to be considered by courts when they address these issues in cases where the Directive applies.
91. **Infringers not paying for the consequences of their wrongs.** Courts have showed themselves to be concerned at times with cartelists using the pass-on defence to escape liability altogether. This may particularly be the case where downstream customers of the cartel do not have a feasible claim, for instance because their claims are too remote.
92. So, for instance, in *TenneT v. Alstom* (2015),⁸⁰ the District Court of Gelderland held that allowing the pass-on defence would unjustly enrich Alstom (a member of the Gas Insulated Switchgear Cartel) because it would reduce TenneT's damages without it being possible for indirect purchasers downstream of TenneT to bring damages actions due to "*diabolical evidentiary problems, issues regarding limitation and other procedural complications, compared with their relatively small and scattered losses*". This case is further described in **Box 7** below.

⁸⁰ District Court of Gelderland, *TenneT v. Alstom*, judgment of 10 June 2015 (ECLI:NL:RBGEL:2015:3713) ("**TenneT v. Alstom (2015)**"), paragraph 2(29).

Box 7: TenneT v. Alstom (2015)

District Court of Gelderland, *TenneT v. Alstom*, judgment of 10 June 2015 (ECLI:NL:RBGEL:2015:3713).

TenneT, the Dutch operator of a high-voltage transmission network, claimed against Alstom for losses allegedly suffered as a result of the cartel between producers of gas insulated switchgear ("GIS"), following on from the 7 October 2009 decision of the Commission in relation to the GIS Cartel. TenneT claimed that it was affected by the GIS Cartel and held Alstom liable for damage resulting from the Cartel in relation to purchases it had made of GIS from the defendant. The District Court made an interlocutory judgment in 2014,⁸¹ with its final judgment coming in 2015.

Alstom alleged that TenneT had passed on any overcharge to its customers. The District Court held that allowing the pass-on defence would unjustly enrich Alstom. This was because it would reduce TenneT's damages without it being possible for indirect purchasers to bring damages actions. As TenneT is a public company, the court found that it would not be unreasonable to "overcompensate" TenneT because, albeit indirectly, consumers may be able to benefit from its ruling via lower electricity prices or taxes.

93. The need for national courts to apply the law with the aim of competition law infringers not escaping liability is a principle recognised in the Directive (in line with the principle of effectiveness of competition law).⁸² However, to what extent an approach like that applied by the Dutch court in *TenneT v Alstom* (2015) is consistent with the compensatory principle established by the Directive⁸³ will need to be considered in cases where the Directive applies.
94. **Loss of sales by the claimant.** In a number of cases, the possible existence of loss of sales as a result of pass-on (i.e., the output or volume effect) has been sufficient for the pass-on defence actually to be rejected on the basis that unjust enrichment to the claimant (i.e. no harm to the claimant) had not been shown. This was the approach adopted by the German Federal Court in *German Carbonless Paper* (2011) and the Spanish Supreme Court in *Spanish Sugar II* (2013). As noted, these rulings pre-date the Directive and this approach may need to be reconsidered in light of the relevant provisions of the Directive in future cases.⁸⁴

II.D.7. Volume Effects

95. The issue which has received by far the least attention in national case-law to date is, in fact, the issue of the volume effect. The volume effect relates

⁸¹ District Court of Gelderland, *TenneT v. Alstom*, judgment of 24 September 2014 (ECLI:NL:RBGEL:2014:6118).

⁸² Article 12(1) *in fine* of the Directive.

⁸³ For example, Articles 12(1) and 12(2).

⁸⁴ See [Section II.D.2](#) above.

to the decrease in sales caused by the pass-on of overcharges and is expressly recognised as a recoverable head of damage in the Directive.⁸⁵

96. While frequently pleaded as a subsidiary head of damages in the event that pass-on is established, it has seldom been properly considered or quantified. As noted in the previous section, the failure to account for the volume effect was considered a reason for rejecting the pass-on defence in *German Carbonless Paper* (2011) and *Spanish Sugar II* (2013), but no quantification of the effect was performed.
97. In only one case that we are aware of has a national court quantified the volume effect: the Danish case of *Cheminova* (2015). In *Cheminova* (2015), a Maritime and Commercial Court in Denmark found that there had been 50% pass-on and consequential loss of sales amounting to 20% of the overcharges. As a result, the amount of compensation claimed (initially reduced to take into account the partial pass-on effect) had to be increased to take into account the volume effects before reaching a final number.⁸⁶

II.E. National legislation on pass-on

98. Germany, Austria and Malta, are, to date, the only jurisdictions in the EU that have enacted specific legislation on pass-on in competition law damages actions.⁸⁷
99. The Austrian and German legislation leaves it to national courts to decide whether passing-on should be accepted in a particular case on the basis of general tort principles (e.g. offsetting of benefits). The German provision has been applied and interpreted by the Federal Supreme Court in *German Carbonless Paper* (2011).
100. While other Member States do not have legislation on passing-on theories in relation to competition law, they do in the context of tax and/or customs law. This is, for instance, the case for France, which in its tax and customs' code allows the State to raise the pass-on defence to confront reimbursement actions

⁸⁵ Article 12(3) of the Directive.

⁸⁶ This case is considered further below in [Sections IV.A.3.2 and IV.A.4.2](#), **Box 23** (in relation to the pass-on effect) and **Box 25** (in relation to the volume effect).

⁸⁷ Section 33 (3), second sentence, and Section 37 (a)(1) second sentence, of the Competition Acts of Germany (2005) and Austria (2013) respectively provide that: "If a good or service is purchased at an excessive price, harm shall not be excluded on account of the resale of the good or service". Section 27A (8) of the 1995 Maltese Competition Act allows defendants to raise the pass-on defence.

from taxpayers.⁸⁸ The defence is interpreted and applied in a similar way to European tax case-law.⁸⁹

II.F. Directive 2014/104/EU

101. The regulation of the concept and operation of pass-on is the subject of Chapter IV of the Directive, although other relevant provisions of the Directive also need to be considered by judges. For ease of reference, the key provisions are set out in the following schematic table (**Box 8**) which, where relevant, includes cross-references to particular sections of this Study where those provisions are developed or given further treatment:

⁸⁸ Article 1965 FA of the Code Général des Impôts: "*Lorsqu'une personne a indûment acquitté des droits indirects régis par le présent code, elle ne peut en obtenir le remboursement, sauf en cas d'erreur matérielle, que si elle justifie que ces droits n'ont pas été répercutés sur l'acheteur*", and article 352 bis of the Code des Douanes: "*Lorsqu'une personne a indûment acquitté des droits et taxes nationaux recouverts selon les procédures du présent code, elle peut en obtenir le remboursement, à moins que les droits et taxes n'aient été répercutés sur l'acheteur.*"

⁸⁹ See *supra* [Section II.A.](#)

Box 8: Provisions in the Directive affecting pass-on

Concept	Rule or Principle	Directive Provision	Further treatment in this Study
Standing	Any victim of a competition law infringement has standing to claim, including both direct and indirect purchasers.	Article 12(1)	Section I.A considers possible categories of claimants.
Full compensation for harm	Victims are entitled to be placed in the position in which they would have been absent the infringement and can accordingly recover actual loss, loss of profits and interest.	Article 3	Section I.B on components of damage, Section III on economic theory and Section IV for methods of quantification. Judicial guidance is provided in Sections V and VI .
Full compensation for harm	Member States should avoid: (i) compensation of harm exceeding that caused by the infringement of competition law to the claimant; and (ii) the absence of liability of the infringer.	Article 12(1)	Sections II.C and II.D provide examples of how the CJEU and some national courts have dealt with this issue to date. (Such rulings will have to be read in the light of the Directive and national implementing legislation).
Actual loss	Actual loss (<i>damnum emergens</i>) typically equates to the overcharge (the price difference between what was actually paid and what would otherwise have been paid in the absence of the infringement) and should not exceed the actual overcharge harm suffered at each level of the supply chain.	Paragraph 39 of the Preamble (see also Article 12(2))	Section I.B on components of damage, Section III for economic theory and Section IV for methods of quantification. Judicial guidance is provided in Sections V and VI .
Loss of sales	Loss of profit on sales (<i>lucrum cessans</i>) caused by the passing-on of overcharges (leading to higher downstream sale prices and reduced sales) constitutes recoverable harm.	Article 12(3)	Section I.B on components of damage, Section III for economic theory and Section IV for methods of quantification. Judicial guidance is provided in Sections V and VI .

Study on the Passing-on of Overcharges

Pass-on defence	Competition law infringers faced with damages claims may invoke the passing-on defence to reduce or reject entirely the actual loss that should be compensated to specific claimants (direct or indirect purchasers). The burden of proof lies with the defendant.	Article 13	See Section I.A for how the pass-on defence can come into play and Section II.C for the treatment of burden of proof by the CJEU. Section II.D contains examples of legal treatment by national courts to date, prior to the Directive.
Indirect purchaser claims	Indirect purchaser claimants may use passing-on as an element of proof of causation in their claims for damages. The burden of proof lies with the claimant, but there is a rebuttable presumption of pass-on to the indirect purchaser in certain circumstances.	Article 14	See Section I.A for how pass-on can be invoked by indirect purchasers. Section II contains examples of legal treatment by national courts to date, prior to the Directive. Section V.A discusses briefly the issue of presumptions and causation.
Estimating pass-on	National courts must have the power to estimate the share of any overcharge that was passed on. The European Commission shall issue guidelines to assist courts to estimate the share of any overcharge that has been passed on.	Articles 12(5) and 16	The object of this Study. In particular, Section III on economic theory, Section IV for methods of quantification and Sections V and VI for practical guidance for judges on managing and assessing evidence.
Disclosure	Reasonable and proportionate disclosure of relevant evidence may be ordered from parties or third parties, where adequately justified and where parties have been properly heard.	Articles 5, 13 and 14(1)	Section IV.C on issues of data collection and Section V.C on disclosure.
Avoiding contradictory findings	Member States should apply procedural mechanisms to ensure that actual loss awarded to claimants at a particular level of the supply chain does not exceed the overcharge harm suffered at that level.	Article 12(2)	Section V.E on parallel proceedings.
Avoiding contradictory findings	National courts should take due account of parallel claims and prior rulings with respect to different levels of the supply chain, as well as relevant information from public enforcement decisions.	Article 15	Section V.B on types of evidence and Section V.E on parallel proceedings.

III. The economics of pass-on

102. The application of economic principles and theory can offer valuable assistance in assessing the price effects of overcharges resulting from competition law infringements. In particular, careful consideration not just of the impact on a firm's costs, but also the relevance of the market context in which that firm operates, is often essential in understanding the way in which an overcharge may have changed a firm's pricing behaviour and that of its competitors. Economics provides the tools to do this.
103. Notably, economic analysis can provide a helpful framework for establishing the coherence and plausibility of claims in respect of passing-on, as well as identifying the likely sensitivities of passing-on effects to the characteristics of the relevant market environment.
104. Nevertheless, it is essential that economic analysis is practically-minded and responds to and is consistent with the factual and other evidence pertaining to an individual case. The economics must 'fit' with the relevant market context. In particular, the framework of assumptions that underpin any economic analysis must reflect the relevant realities of the market at hand. (See [Section V](#) below for further guidance and recommendations for courts on assessing evidence on pass-on in practice.)
105. In this section, we begin with an outline of the economics of firms' pricing behaviour. We then proceed to highlight the key factors identified by economic theory as influencing the pass-on effects exhibited in such pricing. Further detail is contained in [Annex D](#).

III.A. The economics of pricing behaviour

III.A.1. Introduction

106. Mainstream economic theory typically contemplates the pricing behaviour of firms that act rationally, and can be expected to adjust prices where this will increase profits.⁹⁰ One implication is that a firm will have an incentive to adjust its pricing and/or output (where these are typically inter-related) whenever this will increase its revenues by more than its costs, or will reduce its revenues by less than its costs.
107. To illustrate, if selling one more unit of output would bring €2 of extra revenue to the firm (taking into account any reduction in price needed to sell that extra

⁹⁰ Economic methods can, however, be usefully applied even if different objectives prevail.

output) but would cost €3 in terms of extra production costs, then this expansion would not be attractive to the firm. On the other hand, if an increase in price which would result in a €3 reduction in revenue (because the revenue lost from the sales contraction that results would outweigh the increased margins earned on retained sales) would also cause €4 of costs to be avoided, then profits would be increased as a result.

108. In practice, there may be costs associated with the process of price adjustment itself, such as so-called “menu” costs. These costs may cause firms to adjust prices relatively infrequently – leading to prices being somewhat “sticky” – or to do so only when a sufficiently substantial change in price is warranted.
109. Moreover, in order to act on this incentive to adjust prices (so as to increase profits), a firm will also need to have recognised that a relevant change in circumstances has occurred, and identified that a change in pricing would be desirable, and what a sensible price change would be. This may not be a trivial requirement when the cost changes at issue are very small, and/or changes in demand conditions are substantial. Hence, pricing may not be as responsive in practice as simple theory alone would predict.
110. Basic economic reasoning predicts that a firm’s “marginal” costs, i.e. the additional costs per unit associated with a very small increase in output, will have a critical influence on its pricing decisions.⁹¹ This is because the cost changes that would be brought about by the small adjustments to output that would result from further fine-tuning of prices will depend on the level of these marginal costs.⁹²
111. On this basis, as is explained in more detail below, an increase in an input cost caused by a competition law infringement (e.g. cartelised supply of an input) may be expected to have some impact on the price that the purchaser in question charges its customers if it affects the purchaser’s marginal cost.⁹³
112. The extent to which a firm will pass on a cost increase in the form of higher prices is also predicted to depend on the nature of competition; that is, on the way that firms are assumed to compete and, in particular, to respond to each other’s actions. In market settings in which competition takes place between

⁹¹ In the short term, the level of fixed costs – by definition – does not generally depend on the level of output, and hence is not predicted to enter into the pricing equation. However, over the longer term, fixed costs may also be adjusted in response to output changes and may, therefore, influence pricing decisions. For further discussion of this and relevant costs generally, see [Section III.B.3](#).

⁹² Importantly, even if firms do not draw on measures of marginal cost explicitly in setting prices, nevertheless, economic theories which utilise such concepts may still prove to be useful in explaining how those firms in fact set their prices.

⁹³ In economic terms, it could also result in a reduction in service or product quality at a given price, which might have equivalent or similar effects to an increase in price. (In essence, the quality-adjusted price would increase in this case even if the price level was unchanged in absolute terms.)

relatively few firms – i.e. which is “oligopolistic” in character – competition is often imperfect as a result. This means that individual firms will be able to influence market prices to some extent. In this case, firms may increase prices, but this is likely to be at the expense of reduced sales volumes. When responding to cost changes, firms may be expected to take such considerations into account, including the impact that the responses of competitors will have on any loss of sales.⁹⁴

113. This contrasts with competitive market settings – for which the “perfect” competition described in economic textbooks (but rarely seen elsewhere) is the idealised limit – in which individual firms are assumed to take prices as given, i.e. to be “price takers”, acting as if their actions have no influence on those prices.⁹⁵
114. There is an extensive body of economic theory, developed both in the academic literature and in more applied analyses, which considers the behaviour of individual firms given a variety of characterisations of the competition on a market. These analyses have examined the influence that the nature of the competitive interactions between firms can be expected to have on outcomes for prices, in particular. Variations in the assumptions adopted for given economic models can have significant implications for the extent of the passing-on that is predicted. For this reason, the weight that should be given to the predictions of a specific model will depend on the factual support that exists for the model specification in the context of the case at hand, including how well that model explains observed behaviour.⁹⁶

III.A.2. The pricing trade-off

115. Even in situations in which a firm can influence the prices it receives on a market, this is likely to involve a fundamental trade-off: in order to achieve a higher price, a firm will usually have to accept reduced sales. Economics predicts that this trade-off will lie at the heart of a firm’s pricing (or, alternatively, output) decisions. As noted, such a change in price or output will be profitable only so long as it causes revenue to increase by more than cost, or to decrease by less than cost.

⁹⁴ Similar considerations apply in monopoly settings, without the intrusion of competitors, however.

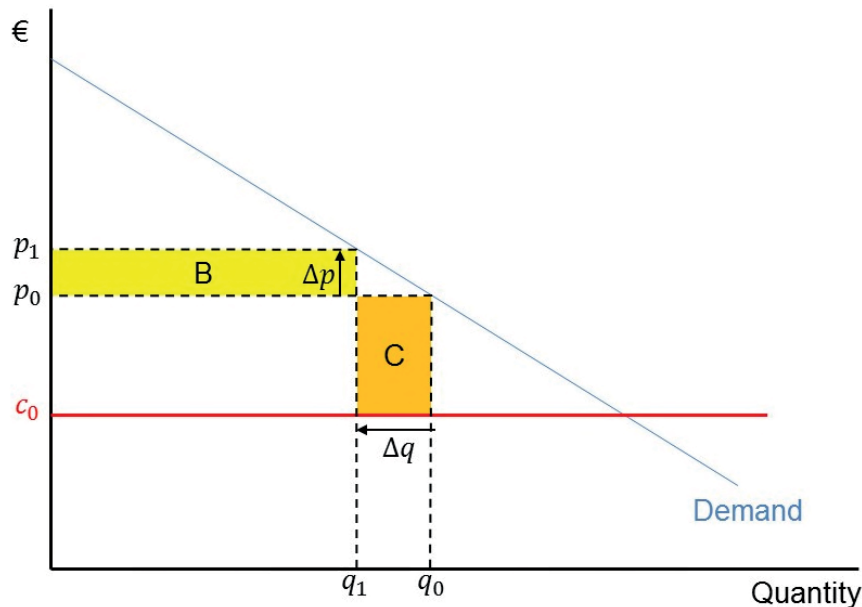
⁹⁵ Under perfect competition, firms are predicted to expand output so long as the additional unit cost to them of supplying that extra output is less than the market price obtained for selling it, which they take as a given.

⁹⁶ Factual evidence may show that the assumptions which underpin particular economic analyses do not correspond to the case at hand. See [Sections V.A](#) and [V.B](#) for further consideration of this point in the context of judicial consideration of evidence of pass-on.

116. The pricing trade-off faced by the firm is illustrated in **Figure 5** below.⁹⁷ If the firm in question would increase its price from p_0 to p_1 , say, a volume of its sales – indicated by the difference, Δq , between q_0 and q_1 – would be lost on account of the effect on demand. This is because customers will typically purchase less in response to a price increase. The profit margins associated with those lost sales – given by the unit margin ($p_0 - c_0$) multiplied by the volume reduction (Δq), and equal to shaded Area C – would also be lost. (These profits are equal to the difference between the revenues associated with these lost sales and the costs avoided when sales volumes are reduced.) At the same time, the price increase would increase the margins earned on the volume of sales (q_1) that are still made by an amount equal to shaded Area B. The price increase in question will be profitable, therefore, if shaded Area B is larger than shaded Area C. The terms of this trade-off depend on customers' responses to the price increases or, more specifically, on the relevant price elasticity of demand; that is, the sensitivity of the demand for a firm's products to changes in its prices. In general, the level of this demand will also depend on the actions of competitors. For example, the adverse impact on a firm's demand of an increase in its price will be reduced if competitors respond by increasing their prices too.
117. Note that this trade-off involves reduction in sales as an inevitable consequence of an increase in price in almost all circumstances. As such, it highlights the similarly inevitable relationship between passing-on and the volume effect of an overcharge, as can be seen by comparing **Figure 5** below with **Figure 2** above.

⁹⁷ For simplicity, the firm's marginal cost are here assumed to be constant; that is, regardless of the level of output, the additional cost associated with supplying every additional unit is the same. In this particular setting, a change in price would alter marginal revenue (as quantity sold would also change), but not the firm's marginal cost.

Figure 5: The profit maximising trade-off between price and sales volume



118. If, instead, the firm reduced its prices, it could secure a greater volume of sales. However, in doing so, it would earn a reduced profit margin on each unit sold. (To see this, consider the process described above in reverse, with the firm reducing price from p_1 to p_0 .)
119. When the effect of a further, small price change is such that Area C in **Figure 5** is equal to Area B, then there is no scope to earn additional profit through such further price adjustment.⁹⁸ If prices were reduced beyond this point, even by a small amount, the additional profits earned on expanded sales would be insufficient to offset the effect of the reduced margins earned on existing sales. At the same time, if prices were increased, the profit margins lost through the resulting reduction in sales volumes would outweigh the increased margins earned on remaining sales.
120. Observe that, by definition, fixed costs, which are costs that do not vary with the level of output and so are not avoided if output is reduced, do not form part of this trade-off and accordingly do not affect the pricing decision in the text book analysis.⁹⁹ Hence, in most economic models, only marginal costs – and changes in those marginal costs – are predicted to affect firms' pricing decisions.

⁹⁸ In other words, marginal revenue equals marginal cost.

⁹⁹ Costs that are fixed over a short time frame may, nevertheless, become variable over longer time frames.

121. At the same time, there may be reasons why fixed costs may influence changes in prices in certain circumstances. For instance, there may be costs associated with supplying a discrete increment in output which would be avoided if that increment as a whole was not supplied (though not if smaller variations in output occurred). In this case, an increase in price which brought about sufficient reduction in output could be profitable even if a smaller change in price, which would induce a smaller change in output, would not. Equally, the cost structure may generate apparent rigidities affecting output adjustment, and small output contractions in response to small cost increases may not be attractive (i.e. profitable). See, for illustrative purposes, **Box 9** below.

Box 9: Illustration of costs associated with an increment in output

Suppose that an airline pays a fee to an airport operator each time one of its aircrafts takes off or lands, which does not depend on the number of passengers carried on the plane. In that case, the level of those charges might not be expected to affect the fares paid by passengers, so long as the airline continues to operate its original flight schedule. (That is because fares will be set – often using sophisticated yield management systems – to generate the most revenue from available seat capacity.) However, a sufficiently large reduction in passenger numbers might cause the airline to consider reducing the number of flights it offers, that is, to save on airport charges. In this case, a change in the airport charges will affect the pricing trade-off faced by the airline in deciding how many flights to operate from the airport in question.

122. As is discussed further below, there are also other circumstances in which fixed costs more generally may play a relevant role in pricing decisions, in which case the passing-on of changes in those fixed costs will become a relevant issue too. This is most clearly the case over the longer-term. The level of fixed costs will affect firms' profitability. Changes in those costs may, therefore encourage firms to exit (or enter) a market, since an increase in costs may imply that fewer firms can cover their costs with a given market outcome. In turn, such a change in market structure may affect prices, resulting in a pass-on effect.¹⁰⁰ Changes in fixed costs may also affect the outcomes of negotiations in buyer power situations – again, potentially affecting the extent of pass-on.¹⁰¹

III.A.3. Passing-on and the pricing response to a change in the firm's costs

123. Significantly, if a firm's marginal costs change, then application of economic principles suggests that a firm will normally have an incentive to change its price (or, alternatively, output decision) too.¹⁰² This is because the terms of the trade-off described previously will be altered. An increase in the firm's marginal costs will reduce the margins earned on sales (or increase the costs avoided if

¹⁰⁰ See [Section III.B.7](#) below.

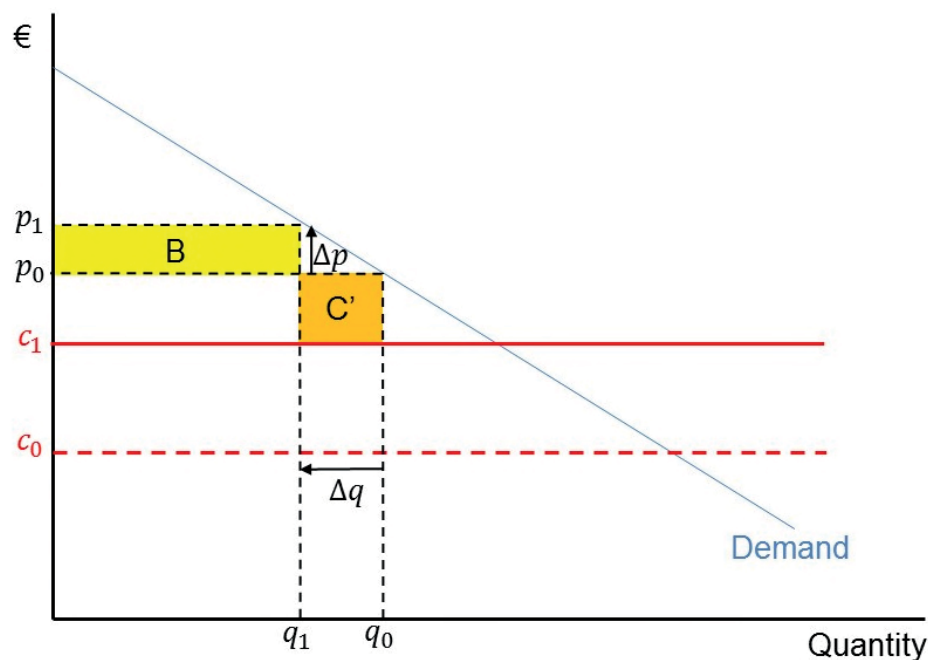
¹⁰¹ See [Section III.B.6](#), and paragraph 182 below, in particular.

¹⁰² As noted at footnote 93 above, a reduction in quality might occur instead, resulting in an increase in the quality-adjusted price even if the price itself is not changed in absolute terms.

those sales are not made) at given prices, reducing the negative effect on profit of a reduction in sales volumes, thereby tipping the balance of the trade-off in favour of an increase in price.

124. This is illustrated in **Figure 6** below. This illustrates an increase in the marginal cost of supply, from c_0 to c_1 . If the firm increases its price from p_0 to p_1 in response, its sales will be reduced from q_0 to q_1 , as previously. However, since the marginal cost of supply has now increased, the profit margin lost as a result is reduced – to shaded Area C' (cf. Area C in **Figure 5**). The firm therefore has an incentive to increase price in response to the increase in its marginal costs. Put differently, therefore, the firm can be expected to pass on that cost change, at least to some extent.

Figure 6: The passing-on and output effects



125. The extent of passing-on predicted by theory depends on the way in which the trade-off described previously changes as price increases. That, in turn, will depend on the shape of demand. A key feature in this respect is the way in which the slope of demand changes as price increases or, equivalently, volume contracts. In other words, it depends on the way that demand curves.
126. In the case of linear, i.e. constant slope, demand and marginal costs which do not vary with the level of output (as illustrated in **Figure 6**), for example, theory

indicates a rate of passing-on of 50% if the market is monopolised, increasing to 100% as the market becomes increasingly competitive. However, potentially quite different rates are predicted to arise if demand is concave (smaller pass-on) or convex (greater pass-on) instead, or if marginal costs change as output changes.¹⁰³

III.A.4. Relevance of competition and market structure

127. As illustrated in **Figure 5** above, the trade-off at the heart of a firm's pricing decisions will depend on the characteristics of demand, as well as the firm's cost structures. Other than in the extreme case where a firm is a monopolist, however, the magnitude of such demand will depend not only on the firm's own pricing decisions but also on the pricing (or, alternatively, output) decisions of its rivals.
128. For example, if the prices charged by a firm's rivals would tend to increase as its own price increased – which is a feature of the 'Bertrand' paradigm of price competition often used by economists – then this will dampen the demand-reducing impact of the firm's own price increases. In other words, it would reduce the loss of sales represented by Area C in **Figure 5** or Area C' in **Figure 6** above. Conversely, if a firm's rivals' outputs would expand if its own sales reduced – which is a feature of the 'Cournot' model of competition; the other leading model of imperfect competition used by economists – then this will dampen the price-increasing impact of the firm's own output reduction. This has important implications for the economics of passing-on.
129. On the one hand, a firm's incentives to increase prices following an increase in its marginal costs will normally be bolstered if rivals would respond by increasing their prices too, all else being equal. Symmetrically, a firm may increase its prices in response to cost increases that only affect its rivals, because these will cause those rivals' prices to increase.
130. On the other hand, if rivals would expand their outputs as a response to a firm contracting its own sales, this can be expected to dilute the passing-on effect on prices of the initial response to the overcharge.
131. The importance of these interactions means that a sound analysis of passing-on will typically require a broader perspective than is provided by information on an individual firm's conduct and performance alone.

¹⁰³ See paragraphs 167 - 169 and [Annex D](#) below for further consideration of these issues.

III.A.5. Volume Effects

132. Finally, observe that passing-on entails a volume effect.¹⁰⁴ Price changes and output changes are two sides of the same coin. Indeed, as is evident from the diagrams above, the volume effect is a fundamental part of the trade-off which motivates and may determine the scale of the passing-on effect in the first place.

III.B. Insights from relevant economic theory¹⁰⁵

III.B.1. Introduction

133. Where there is an overcharge – such as that resulting from the operation of a cartel or from abuse, for example – economic reasoning suggests that the affected downstream firm can be expected to respond to this cost change by adjusting its own pricing behaviour, thereby passing on at least some of the cost increase to its customers. For a given volume of sales, pass-on will, where it occurs, reduce the adverse effects of the overcharge on the profits of that firm. At the same time, however, any pass-on of the overcharge to downstream prices is likely to have an adverse effect on the firm's sales volumes, as well as on indirect purchasers downstream.

134. For simplicity, we will couch our discussion in terms of the impact on the harm suffered by a direct purchaser. However, the analysis generally carries over to indirect purchasers that are not end customers too.

135. As set out in Section I above, the damage caused to a direct purchaser by an increase in its costs, brought about by an illegal increase in the price of an input, is made up of three terms:

$$\text{Damage} = \text{Overcharge} - \text{Passing-on effect} + \text{Volume effect}$$

136. This report focusses on the passing-on and volume effects. However, it should not be forgotten that the overcharge is the source of these other effects. Hence, understanding the nature of the overcharge (particularly which firms are affected by it) is important to understanding the passing-on and volume effects.

¹⁰⁴ Except for the extreme case where demand is perfectly inelastic; i.e. quantities demanded are not affected by changes in price.

¹⁰⁵ See RBB Economics (2014): 'Cost pass-through: theory, measurement and policy implications, a report prepared for the Office of Fair Trading' ("**2014 RBB OFT Report**") for a detailed analysis of pass-on.

137. Each of these terms can be broken down further into its component elements. Thus, the variable component of the overcharge term can be expressed in terms of the increase in the direct purchaser's average variable cost per unit multiplied by the volume of its sales. However, in principle it could also include changes in fixed costs, which do not vary with a change in output.
138. The passing-on term is obtained by multiplying the increase in the direct purchaser's unit price arising from pass-on of the overcharge by the observed sales volume (i.e. given pass-on), whilst the volume effect is obtained by multiplying the change in sales volume that results from that price increase by the unit margins that would have been earned on those sales (i.e. 'but for' pass-on).

III.B.2. Relevant cost effects

139. As discussed in Section III.A above, the application of economic principles suggests that it is generally a firm's marginal costs that will have the decisive influence on its pricing decisions, at least over the short-term. It is the impact of any overcharge on the purchaser's marginal costs which is, therefore, predicted to be most relevant to the economic analysis of (short-run) pass-on.^{106,107}
140. At the same time, consideration of overcharges affecting fixed costs may also be relevant in specific situations. That is clearly the case over the longer term, when firms must make a decision to renew fixed assets or leave the market.¹⁰⁸ It will also be true in some situations with negotiated prices (see paragraph 182 below). It may be the case too where the incremental costs of fulfilling a particular contract, say, include additional fixed costs. Factual evidence may also indicate that fixed costs have an important influence on a firm's pricing decisions in practice. Careful assessment of the case-specific pricing context is therefore warranted to confirm the relevance or otherwise of overcharges which affect fixed costs.¹⁰⁹
141. The first step in analysing the extent to which an overcharge is, or is likely to be, passed on is to understand how that overcharge affects the purchaser's marginal costs. This will depend on the amount of the affected input that is required to produce each *additional* unit of the downstream product or

¹⁰⁶ See, for example, the 2014 RBB OFT Report, Bulow & Pfleiderer (1983), and Ten Kate & Niels (2005).

¹⁰⁷ Any changes in fixed costs are nevertheless relevant to the magnitude of the overcharge effect, however.

¹⁰⁸ Nevertheless, the extent to which long-term pass-on of costs can be considered relevant for legal purposes in the area of EU competition damages claims may be a pertinent question (as it is in the US, for example).

¹⁰⁹ See Chapter 1.7.1 of the 2014 RBB OFT Report, for example, for further consideration of the pass-on of fixed costs.

service.¹¹⁰ For example, if the unit price of the input is inflated by €1 as a result of the infringement, and 3 additional units of this input are required to produce each additional unit of downstream output, then the impact of the overcharge on the incremental cost of producing that extra unit of output would be €3. On the other hand, if a marginal increase in supply by the downstream customer would involve only a fractional increase in the amount of the affected input used, then the impact of the overcharge on the direct customer's marginal costs will be a fraction of the effect on the input price. For example, if one additional unit of the affected input is needed per thousand units of downstream output produced, a €1 increase in the price of the input will translate into an increase in the cost of producing an extra unit of the downstream product of just €0.001; i.e. only an extra one tenth of one cent.

142. In general, a firm might change the mix of inputs it uses in response to an overcharge which makes one of those inputs relatively more costly. In this case, simply measuring the additional expenditure actually incurred purchasing the affected input may understate the extent of the damage caused by the overcharge.
143. To illustrate, suppose that the price of input A is increased from €1 to €1.50. As a result, the purchaser uses 900 units of input A to produce the realised output, instead of the 1200 units it would have used had the price not been inflated. It also uses 400 additional units of input B, which costs €0.25 per unit. In this case, the overcharge increases the purchaser's costs by €550, i.e. an additional €450 ($900 \times €0.50$ per unit) spent purchasing input A at the inflated price plus the €100 expense of purchasing the extra 400 units of input B ($400 \times €0.25$ per unit).

III.B.3. Firm-specific versus industry-wide overcharges

144. The economic literature contrasts the extent and effects of passing-on when a cost increase affects an individual firm only, i.e. it is **firm-specific**, with situations where the cost increase is common to all the firms in a market, i.e. it is **industry-wide**. Intermediate cases, in which some but not all firms in an industry are affected, are easy to conceive too. For example, that might be the case when some competitors on a market use a particular technology but others do not. In this case, a change in the cost associated with that technology will affect that sub-set of competitors only. The 'reach'

¹¹⁰ In general, that need not be equivalent to the impact on average costs, which will depend on the number of units of affected input utilised per unit of output averaged over the total output produced.

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of an overcharge is likely to have a critical bearing on the extent of passing-on, and the damages resulting from the overcharge.

145. If an overcharge affects one firm but not its competitors, that firm's ability to pass on the cost increase – or its ability to do so profitably, at least – is predicted to be constrained, on account of the sales it would thereby lose to those rivals. On the other hand, if a firm's rivals' costs are raised whilst its own are not, this is likely to provide enhanced scope to increase its own prices and expand sales and profits. For this reason, an overcharge affecting one firm's costs may cause other firms' prices to increase, giving rise to so-called 'cross' or 'umbrella' effects.
146. If similar, competing firms are affected by a common, i.e. industry-wide, overcharge, then this will not give one firm a competitive advantage or disadvantage relative to another. Unless the rate of passing-on exceeds 100%, profits for all firms can be expected to decrease as a result of this overcharge. Indeed, even if the overcharge is passed on in full, the resulting volume effect is likely to reduce profits – unless demand is highly inelastic.¹¹¹
147. At the same time, an industry-wide overcharge may affect different competitors' costs differently. Moreover, the pricing – i.e. passing-on – responses of different firms to a common cost impact may also differ, depending on the differentiation that exists in the market environment in which they operate, for example.
148. A number of national courts in the EU have drawn on these intuitions in their findings on pass-on, as illustrated in [Section II.D.4](#) above.

Box 10: Firm-specific v. industry-wide overcharges - EU national case-law illustrations

In *DOUX Aliments* (2014) one of the factors on which the Paris Court of Appeal relied to find that there had been no pass-on was the fact that the claimants, poultry producers, had to compete with producers located overseas which were not subject to the lysine cartel. In *EKKO* (2002), a Danish court found no pass-on had occurred when a company subject to an overcharge was the only one affected in a market with fierce competition and where its market share amounted to just 2%. In *Spanish Sugar II* (2013), the Spanish Supreme Court did not consider that the claimants, direct purchasers of industrial sugar, could have passed on the overcharges when there was evidence that the cartel had affected the industry's competitiveness vis-à-vis foreign competitors. Conversely, in *Arkopharma* (2006), a direct purchaser claim was rejected by a French commercial court, on the basis that the cartel had affected 80% of the market and, therefore, it would have been possible for the claimant to pass on the overcharges because its competitors were also subject to them.

¹¹¹ That said, economic theory indicates that an industry-wide overcharge can dampen competition sufficiently that affected firms' profits would actually be increased as a result in some extreme situations.

149. In this context, the nature and intensity of competition is predicted to have an important bearing on the extent of passing-on, and the magnitude of the damages caused by the overcharge. Economic theory provides useful guidance on the factors that will influence the extent of the passing-on that may arise in these situations. However, applying these insights to the circumstances of specific cases also relies on careful understanding of the implications of case-specific facts.

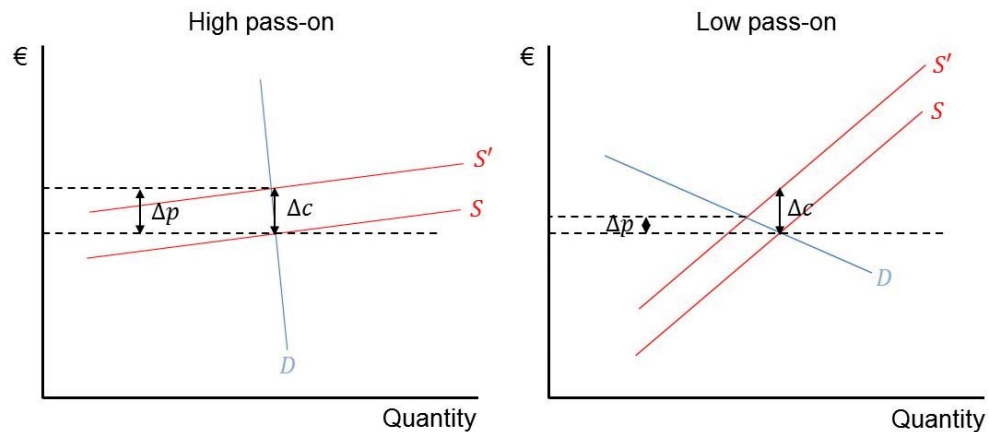
III.B.4. Pass-on in competitive scenarios¹¹²

150. An analysis of competitive market environments may provide a good starting point for the exposition of passing-on effects in this Study. In this respect, the textbook paradigm of perfect competition offers a natural benchmark, though few, if any, actual markets resemble its idealised features in practice. In the textbook model, firms are atomistic 'price takers' – i.e. they take prices as a given, which they cannot influence, and must simply decide how much output to supply to the market accordingly. It is predicted that they will do so provided marginal cost is less than that price. Hence, an individual firm's supply curve is traced out by its marginal cost curve – and the industry supply curve is simply the sum of individual firms' marginal cost curves.

151. Suppose that a firm is subject to a firm-specific overcharge in this environment. Either its marginal costs will continue to be below the prevailing market price, despite the overcharge, in which case the firm will continue to supply the same volume to the market, or else its marginal costs will be increased above the prevailing market price, in which case some of its supply will no longer be profitable, and the volume it puts on the market will be reduced. Nevertheless, if the firm is very small, such individual changes in output will have negligible impact on aggregate supply, and hence on the market price. There will be no pass-on of such firm-specific overcharges, therefore, in this competitive setting.

¹¹² See, also, [Section D.1.2](#) of [Annex D](#) and Chapters 2-3 of the 2014 RBB OFT Report.

Figure 7: Passing-on in competitive markets



152. The extent of passing-on of industry-wide overcharges in competitive markets depends on the relative elasticities of supply and demand. The more elastic is supply relative to demand, the greater the extent of passing-on. (See the price effects Δp of overcharge Δc in the contrasting panels in **Figure 7** above.) Importantly, even under perfectly competitive conditions, full passing-on will arise only if supply is fully elastic, i.e. the supply curve is horizontal, or if demand is fully inelastic, i.e. is insensitive to changes in price.
153. There are important analogies here with the economics of tax incidence.¹¹³ Pass-on defences or claims based on this sort of theoretical analysis have been made in both the US and the EU. In the US, references to “tax incidence theory” are normal in economic expert reports prepared in the context of class certification in indirect purchaser class actions (see the illustration in **Box 24**).

¹¹³ To date, much of the consideration of passing-on by courts in the EU has arisen in the context of claims for the reimbursement of taxes unduly levied as a matter of EU or national law; see [Section II](#) above.

Box 11: The use of tax incidence theory (*In A&M Supply v. Microsoft Corp*)

In *A&M Supply v. Microsoft Corp.*, a follow-on damages indirect purchaser class action, the claimants (end users), alleged that Microsoft was able to impose overcharges in the sale of its operating system and PC software by eliminating competition.¹¹⁴ The claimants' expert drew on tax incidence theory to argue that overcharges had been passed on to end users. In particular, the expert found 100% pass-on "likely" because of, *inter alia*, the intense competition in the distribution of Microsoft products and the lack of substitutability (which implied low demand elasticity). Microsoft's expert, on the other hand, argued that the intermediate levels of the distribution chain were far from perfectly competitive because the PC industry produces highly differentiated products and because computer retailing could not be considered an example of textbook perfect competition. The court dismissed class certification holding that the plaintiffs' expert had not "*bridged the gap between economic theory and reality of economic damages*" and found the tax incidence theory to be speculative in that case.

154. The extent of passing-on of industry-wide overcharges can be less than 100% in competitive situations because prices are determined by the level of marginal costs, and pass-on of the overcharge will cause output to contract (assuming demand is not perfectly inelastic) and marginal costs to be reduced if the supply curve is upward sloping.
155. In practice, the characteristics of "competitive" markets may depart from the "perfect" textbook formulation in significant respects, with important implications for predicted pass-on effects, as discussed further in the context of oligopoly below.

III.B.5. Oligopoly¹¹⁵

156. In reality, many markets are characterised by competition between relatively few firms, i.e. supply is oligopolistic and competition is imperfect. The outcomes of such competition can span a wide array of possibilities, depending on the market structure and the nature of that competition. For a given market structure, these can range from rather uncompetitive outcomes, on the one hand, to highly competitive outcomes at the other, depending on the intensity of the rivalry between firms. In industries where fixed costs are significant, for example, a fragmented market structure may not be sustainable. That is because a large number of firms is likely to mean more intense competition, and such competition (and smaller sales volumes per firm) will squeeze the margins that firms require in order to be able to cover those fixed costs.
157. The distinctive feature of oligopolistic settings is that individual firms are taken to be aware of the strategic nature of their relationships with rivals

¹¹⁴ See *A&M Supply v. Microsoft Corp.*, 654 N.W.2d 572 (Mich. 2002) ("**A&M Supply v. Microsoft Corp.**").

¹¹⁵ See, also, Section D.1.3 of Annex D. Chapter 4 of the 2014 RBB OFT Report provides an overview of relevant theory.

and the influence that their actions can have on prices. The nature of these interactions, and the intensity of the competition that results, can vary significantly from one setting to another, and a variety of economic models have been developed to describe such oligopolistic market behaviour and its outcomes. Economic analysis indicates that these differences can have an important bearing on passing-on.

Box 12: Economic models of oligopolistic competition

The so-called 'Bertrand' or 'Cournot' paradigms of competition provide the foundations for most economic models of oligopolistic competition.

The Cournot paradigm assumes that firms choose the quantities they supply to the market (to maximise their profits), taking the quantities supplied by their rivals as a given. Market prices then adjust to ensure that market supply and demand are balanced. Under Bertrand competition, firms are assumed to choose the prices at which they will supply the market (again, to maximise their profits), taking the prices of their rivals as a given. Demand for individual products is then determined by the matrix of market prices. In most situations, however, there is not a straightforward characterisation of markets as 'Bertrand' markets or 'Cournot' markets.

Significantly, Cournot assumptions imply less intense competitive rivalry between firms than Bertrand assumptions, for a given market structure. A key feature of Cournot competition is that prices decline relatively gradually as the number of competing firms increases. In contrast, with undifferentiated Bertrand competition, rivalry between even a small number of competitors is predicted to be intense. This means that such a market may sustain relatively few firms with Bertrand competition. However, the more differentiated the products supplied by competing firms, the less intense will be the competition between them, even under Bertrand assumptions.

III.B.5.1. Homogeneous goods industries

158. Competition focussed purely on prices may be very intense in homogeneous good settings. An outcome sustaining multiple firms may not exist in such situations, therefore. This is because vigorous price competition is liable to cause all sales to gravitate to the lowest cost firm, unless diseconomies of scale are significant, most obviously when capacity constraints are a relevant factor.
159. Where such capacity constraints are relevant, a firm-specific overcharge affecting the firm providing the marginal capacity on the market may change the market price generally, for example. Equally, overcharges that only affect relatively efficient, 'infra-marginal' firms may have no impact on market prices at all where they do not change the identity of the marginal, price-setting capacity on the market.
160. Models which contemplate quantity-based competitive interaction predict less intense rivalry, and provide a basis for competition to be sustained

between multiple firms even in homogeneous good settings. Given the nature of the market, a single market price will prevail and any pass-on of either industry-wide or firm-specific overcharges must affect that single market price.

161. The insight offered by economic theory indicates that the extent to which **industry-wide overcharges** are passed on in this setting will depend on three key factors, namely: (i) the intensity of competition; (ii) the sensitivity of marginal cost to the level of output; and (iii) the curvature of demand or, more precisely, the elasticity of the slope of inverse demand.¹¹⁶
162. **Intensity of competition.** This will depend on the number of firms that compete on the market and the nature of the competition between them. As noted, outcomes can vary from monopolistic ones, with minimal competition, at one extreme, to highly competitive ones at the other.
163. The insight provided by relevant theory indicates that the pass-on of industry-wide overcharges will increase as competition on the market becomes more intense. In the case of linear (constant slope) demand and marginal costs that do not change with the level of output, for example, the rate of passing-on is predicted to range from 50% under conditions of monopoly to 100% with maximum competition.¹¹⁷
164. It is notable, therefore, that even a monopolist can be expected to pass on the effects of an overcharge – i.e. even a monopolist will have an incentive to change its price in response to a change in its marginal costs – though typically on a less than one-to-one basis.
165. **Slope of marginal cost.** The economics suggests that pass-on rates will be reduced if marginal costs are upward-sloping, i.e. increasing with the level of output, and increased if they are downward-sloping, when compared to the situation where they are unaffected by the level of output.
166. Since passing-on will generally lead to a reduction in output, this will also bring about a reduction in marginal cost too if the marginal cost curve is upward-sloping. In general, firms in oligopolies can be expected to respond to such a reduction in their marginal costs by reducing prices. The reverse will hold if marginal costs are downward-sloping. Hence, the change in output which accompanies passing-on may cause the effects of the initial overcharge to be dampened or magnified, depending on the effect on marginal cost.

¹¹⁶ See, for example, Seade (1985) and Weyl & Fabinger (2012).

¹¹⁷ See, for example, Bulow & Pfleiderer (1983) and Ten Kate & Niels (2005).

167. **Curvature of demand.** Consideration of the economics of firms' pricing decisions suggests they will be sensitive to the elasticity of demand. In turn, it follows that the extent of the changes in firms' pricing decisions induced by an overcharge will depend on the way in which this demand elasticity changes as price increases, i.e. on the elasticity of the slope of demand or, similarly, the elasticity of the elasticity of demand.¹¹⁸
168. The more price-sensitive that demand becomes as price increases - in more technical language, the more concave is demand, the smaller the predicted extent of passing-on. Thus, rates of passing-on are predicted to be smaller with concave demand than for linear demand, and smaller for linear demand than for convex demand. Thus, differences in the curvature of demand may imply significant differences in the level of passing-on, for given market structure and levels of competition.
169. Rates of passing-on are generally predicted to increase with the intensity of competition for demands with a range of different curvatures, provided demand is not highly convex.
170. The more precise and robust the relevant measures of these three parameters that are available, the more reliable the insights that economic theory can provide regarding passing-on in a particular case. Conversely, absent an accurate measure of each of these parameters, the predictions of theory will, necessarily, be imprecise. A particular issue arises in respect of uncertainties regarding the curvature of demand, since a measure of this is typically not available. Significantly, however, the impact of such uncertainty regarding demand curvature will be smaller the more intense is competition on the market.
171. Similar considerations apply in respect of **firm-specific overcharges**. As noted, where a single market price prevails, any passing-on of firm-specific overcharges must occur via the effect on this price. However, intuitively, when the market price depends on the output decisions of multiple firms, the impact on that price of an overcharge affecting a single firm will be less than that of an overcharge affecting all or many firms. Importantly, and unlike the case of industry-wide overcharges, the passing-on of firm-specific overcharges is likely to be smaller the more intense is competitive rivalry on the market.

¹¹⁸ See, for example, Bulow & Pfleiderer (1983).

III.B.5.2. Industries in which products are differentiated

172. Differentiation can arise either in terms of product characteristics, or geography. Differentiation creates additional 'distance' or 'space' between an individual firm and its rivals. The effect of increases in such differentiation is to reduce the intensity of competition. As such, the implications of differentiation for the passing-on of **industry-wide overcharges** are similar to the effects of reducing the intensity of competition in the homogeneous goods case.¹¹⁹ (In a highly differentiated market, each firm is essentially a local monopolist. Conversely, the less differentiated the market is, the more it will resemble a homogeneous product market.) For an illustration of a court applying these insights from economic theory to make a finding in respect of the rate of passing-on, see **Box 13**.

Box 13: Cheminova (2015) – application of economic theory to monopolistic market

On the basis of product differentiation, and the theory of monopolistic competition in particular, a Danish Court found that a claimant, Cheminova (a producer of pesticides), which brought a follow-on claim against Akzo Nobel for damages arising out of participation in the MCCA cartel, had passed on 50% of the overcharges (cf. the discussion of pass-on in the monopoly setting with linear demand and constant marginal costs at paragraph 163 above). Adopting the court-appointed expert's conclusions, the Court found that this level of pass-on tends to be at this level in markets with limited competition between products and variants which are less dependent on whether the cost increase is general or specific. The expert concluded that the pesticides market was a market characterized by monopolistic competition on the basis of a market study.

173. The effects of **firm-specific overcharges** in differentiated settings are potentially more sensitive to the particular features of the market at issue – notably the nature of differentiation and of competition.
174. Consider, for example, the impact of the number of firms present on such a market. The more firms there are, the more this will tend to reduce the extent of differentiation and increase the intensity of competition, which can be expected to reduce the passing-on of firm-specific overcharges, as explained above. At the same time, the presence of more firms on the market will tend to dilute the sensitivity of a firm's pricing to that of any one rival and, hence, the strategic responses of unaffected firms to a firm-specific overcharge. Those responses may either magnify or dilute the original pass-on effect. If the former holds, then the various consequences of more firms will reinforce each other, causing passing-on of firm-specific overcharges to be reduced. However, if the latter holds, then the diluting of the strategic effect will tend to increase the passing-on of such overcharges as the number

¹¹⁹ For an analysis of pass-on in differentiated products settings see, for example, Anderson et al. (2001).

of firms gets larger. Hence the overall impact of more firms on passing-on of firm-specific overcharges may depend delicately on the nature of the strategic effects at work in the context at hand.¹²⁰

III.B.6. The influence of buyer power¹²¹

175. As described above, the pass-on settings that are of interest include those in which firms at one stage in the supply chain sell to others which themselves sell to consumers or yet other firms. This raises the prospect that an affected firm's customers may hold significant buyer power.
176. It might be supposed that strong buyers, that are able to extract attractive terms from sellers, would also be able to resist price increases resulting from the passing-on of overcharges. However, the insights offered by economic theory indicate that this will very much depend on the specific features of the negotiations in the case at hand.
177. Buyer power arises where the buyer is relatively more able and willing to 'walk away' from negotiations than the supplier. Critically, however, the extent of passing-on will depend on the way that the outcome of the negotiation between a buyer and a seller changes in response to an overcharge. In turn, much will depend on the nature of individual negotiations, and the specific context in which they take place. Case-by-case consideration of these factors is, therefore, warranted.
178. If the outcome of those negotiations is fixed by the buyer's ability to switch to an alternative source of supply – i.e. a supply option 'outside' the one being negotiated – and this alternative is not affected by the overcharge, then the negotiated price may not change as a result of the overcharge either. In this case, either the seller will have to absorb the overcharge, or else the buyer may take the alternative supply option instead. Note, though, that the extent of pass-on in this case, or rather the lack of it, does not depend on the absolute strength of the buyer's original bargaining power. What matters, instead, is whether (and, if so, how) the bargaining power of the buyer and, therefore, the outcome of the negotiation is affected by the overcharge at issue. In other words, how is the outcome of the negotiation changed?
179. On the other hand, if it is the outside option that is affected by the overcharge, then the negotiated price may change even if the costs of the product at the heart of the negotiation are unaffected. In other words, an

¹²⁰ See, for example, Zimmerman & Carlson (2010).

¹²¹ See, also, Section D.1.6 of Annex D.

overcharge which affects the buyer's outside option may allow the seller in question to secure better terms. (The converse will hold if the overcharge affects the seller's outside option.) In this case, therefore, there may be a 'cross' pass-on effect, whereby an overcharge affecting one product results in the price of another being increased.

180. In another scenario, a powerful buyer may have managed to secure cost reflective or "cost-plus" terms in its negotiations with a seller. In this case, economics would suggest that any change in those costs resulting from an overcharge could be expected to be passed on substantially to the negotiated price, and to the transaction price, therefore, if the buyer continues to purchase from that seller.
181. At their simplest, negotiations between a buyer and a seller will focus on the unit price at which products or services will be traded between them. The extent to which a change in costs will be passed on in the wholesale price will therefore depend on the way in which particular negotiations translate a cost increase to this wholesale price. Significantly, if the buyer passes on any increase in the wholesale price to its own, downstream, prices, this will reduce the sales of both the buyer and the seller. This will affect the incentives the seller has to pass on any overcharges in the first place. This highlights, again, the importance of a proper understanding of the nature and intensity of competition, including on relevant downstream markets, to any appraisal of pass-on.
182. Buyers and sellers may also be able to negotiate a combination of per unit charges and fixed fees. An economically efficient outcome in this setting would see the unit charge set equal to relevant marginal costs, so that an overcharge affecting marginal costs would be passed on fully to those charges. However, the fixed fee component might also be changed. That means that overcharges affecting fixed costs could be passed on in this setting too.
183. Significantly, the fixed fee component might also be adjusted as negotiations respond to an increase in marginal costs in this context. That could result in the seller absorbing some of an overcharge affecting marginal costs only, even if that cost change is notionally reflected fully in a change in the unit charge. That suggests that considerable care is required in evaluating pricing outcomes in such situations in order to avoid drawing superficial conclusions regarding the extent of pass-on.
184. In principle, similar issues may be raised if an infringement of competition law has resulted in buyers imposing deflated prices on their suppliers. Careful, case-specific consideration of how conduct on the buyer-side of the

market has affected the outcomes of negotiations between buyers and their suppliers, as described in the preceding paragraphs, is required to assess how any adverse effects might be transmitted up the supply chain. This would include, but is not limited to, an assessment of how this impacts on volumes purchased.¹²² More significantly, it is relevant – indeed, critical – to consider how conduct with respect to suppliers may have adversely affected end customers, e.g. through market foreclosure.

III.B.7. The influence of entry and exit¹²³

185. As discussed above, if the passing-on of an overcharge is less than complete, the profits of affected firms will certainly be reduced. This includes the case where an overcharge affects fixed costs and (therefore) may not affect pricing in the short term. Even where the rate of passing-on equals or exceeds 100%, profits are liable to be reduced, on account of the adverse impact of the volume effect.
186. Over the longer term, an overcharge which reduces the profitability of firms in this way may lead one or more of those firms exiting the market, thereby changing market structure.¹²⁴ Such a change in structure may, in turn, lead to changed pricing outcomes. Most obviously, prices may be increased as a result of the market becoming more concentrated. In this scenario, the passing-on of the initial overcharge will become magnified over the longer term.
187. One implication of these longer-term entry/exit responses is that even overcharges which affect fixed costs, and which may not, therefore, influence firms' pricing behaviour immediately may, nevertheless, have longer term passing-on effects.
188. At the same time, the relevant economics indicates that, in some circumstances, the response to an industry-wide overcharge could result in affected firms' profits actually being increased, on account of the lessening of competitive pressure that results. However, such enhanced profitability might be expected to encourage the entry of additional firms to the market

¹²² In the classical theory of monopsony/oligopsony (the analogues of monopoly/oligopoly on the supply-side), powerful buyers may shrink their demands in order to secure better terms. In practice, however, such bargaining strength is often associated with the promise of increased purchases, suggesting that a different, bargaining perspective is required.

¹²³ See, for example, Besley (1989).

¹²⁴ Reductions in profitability may also have effects on investment even if they do not result in a firm leaving the market completely.

over the longer term. This will tend to bring downward pressure to bear on prices, offsetting some of the initial pass-on effect.¹²⁵

189. If a single firm is the subject of an overcharge, the economics indicates that this will have an adverse impact on that firm's profits, whilst increasing the profits of rivals. In some cases, the affected firm may be encouraged to exit the market as a consequence, thereby increasing upward pressure on prices. This enhanced profit opportunity may, simultaneously, encourage entry by unaffected firms however. Any such entry will, naturally, tend to result in offsetting downward pressure on prices, reducing the original passing-on effect.

III.B.8. Volume effects¹²⁶

190. The fundamental economics of passing-on is intrinsically linked to the loss of sales (the "volume effect") that will generally accompany any increase in prices. Put simply, the consideration which discourages firms from increasing prices any further in response to an overcharge is the loss of profits that would accompany the resulting further reduction of sales volumes.
191. The extent of this volume effect will, therefore, depend on the sensitivity of the firm's sales to the passed-on price effects of the overcharge. As such, it will be sensitive to the extent of the passing-on effect whilst, at the same time, also influencing the magnitude of that price increase.
192. When the affected firm is a monopolist, the volume effect will depend only on the sensitivity of demand to its own price; in other words, the 'own-price' elasticity of demand. If there would be no scope for the monopolist to increase prices profitably absent the overcharge, then the adverse volume effect from the passing-on of a small overcharge would almost exactly offset the passing-on effect. The damage to the monopolist is then approximated by the overcharge alone. On the other hand, by the same logic, the volume effect that results from the passing-on of a more substantial overcharge effect will be greater than the passing-on benefit.¹²⁷ In this case, the overall damage to the monopoly purchaser will be significantly greater than the overcharge alone.

¹²⁵ When fixed costs are limited and individual firms are small, a fluid process of entry and exit may prevent pass-on from affecting profits. However, fixed costs will introduce frictions to this process, especially if those fixed costs are also sunk, i.e. irreversible.

¹²⁶ See, also, Section D.1.8 of Annex D.

¹²⁷ See, for example, Verboven & van Dijk (2009).

193. In oligopoly settings, the volume effect will be determined not only by the change in a firm's own price, but also by the changes in rivals' prices (or, equivalently, by the corresponding output adjustments directly). With firm-specific overcharges, rivals' prices will change in response to the affected firm's own change in behaviour; with industry-wide overcharges, they will respond to the change in their own costs directly, as well as in response to changes in rivals' behaviour. Indeed, for small overcharges, economic theory suggests that the balance between the passing-on and volume effects associated with a firm-specific overcharge will depend on the impact of rivals' responses alone. Hence, the conventional measures of the own-price elasticity of demand, which take rivals' prices as given, may not provide exactly the right inputs for the analysis of such volume effects. (See [Section IV](#) below for consideration of such issues in practice.)

III.B.9. Indirect purchaser effects

194. Analogous issues arise at the indirect purchaser level in respect of the passing-on of the overcharges. Thus, the impact of an overcharge on these indirect purchasers is predicted to depend on the combination of the way in which the overcharge is passed on by the direct purchaser to the indirect purchaser and the way in which the indirect purchaser's own passing-on behaviour responds to this increase in its costs. As with passing-on at the direct purchaser level, the extent to which competitors are similarly or differently affected will have a significant bearing on this and hence on damages too.

IV. Quantification of the passing-on and volume effects: an economic approach

195. In this section of the Study, we present in some detail different empirical strategies that can be pursued to quantify the passing-on and the volume effects.
196. The section is organised as follows: Section IV.A provides an overview of the empirical strategies that may be deployed to estimate the magnitudes of the passing-on and volume effects at both the direct purchaser and indirect purchaser levels. Section IV.B discusses in detail some of the estimation issues raised by these strategies, focussing in particular on the key inputs needed to calculate the passing-on and volume effects. Section IV.C summarises the main challenges that arise in collecting the data required to quantify these effects.

IV.A. Economic strategies for damage estimation

IV.A.1. Overview

197. The purpose of this subsection is to provide an overview of the different damage quantification strategies that may be deployed to estimate the magnitudes of the passing-on and volume effects, and the information and other requirements associated with these.
198. As set out in preceding sections, the damages that result from an overcharge are the conjunction of three distinct effects: the overcharge itself; the passing-on effect; and the volume effect. When considering either direct purchasers or indirect purchasers who are not end-users, the damages are made up of these three components. In this section, we will describe in broad terms the different approaches that the expert can pursue to quantify each of these three components of the overall damage or alternative strategies, which address two, or even all three, components simultaneously. In doing so, we concentrate on the passing-on and volume effects, since this Study focusses on these two effects. Nevertheless, insight from the estimation of overcharges is relevant too. Specifically, some approaches to quantifying the passing-on effect mirror closely those for quantifying overcharges. In fact, as explained in Section I.B.5 for the customers of the purchaser in question, the passing-on effect for an upstream seller is just an overcharge for the downstream purchaser. Furthermore, a measure of the

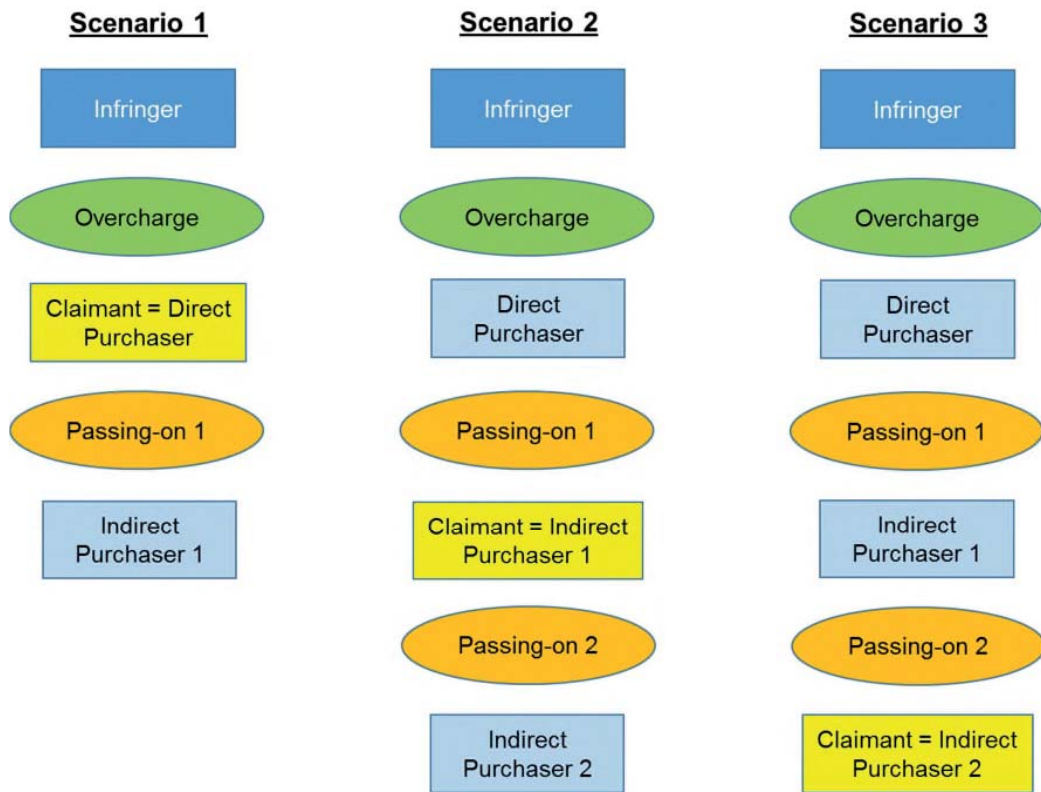
overcharge will often serve as an input in the quantification of the passing-on and volume effects.

199. It is relevant to recall at the outset that the guiding economic principle that is relevant in quantifying antitrust damage is the comparison of realised outcomes with what would have happened absent the infringement, i.e. in the so-called counterfactual. In economic terms, the damage suffered by a firm will be the difference in profit between "*the actual position of the injured party [...and...] the position in which this party would have been but for the infringement.*"^{128,129} This principle informs not only the quantification of the overcharge but also the estimation of the passing-on effect and of the volume effect.
200. Three notable passing-on scenarios were illustrated in **Figure 1** above. It may be useful to have these three scenarios in mind when considering the practicalities of damage estimation, as this determines at which level of the supply chain the relevant information and data required for analysis are located. For ease of reference, **Figure 1** is repeated as **Figure 8** below.

¹²⁸ EC Practical Guide at paragraph 12.

¹²⁹ In economics, the loss suffered will be computed as the difference in the claimant's profit, specifically between the actual and the counterfactual profit levels. The meaning of profit as used here may not necessarily coincide with the legal classification of loss as either actual loss (*damnum emergens*) or loss of profit (*lucrum cessans*).

Figure 8: Passing-on scenarios



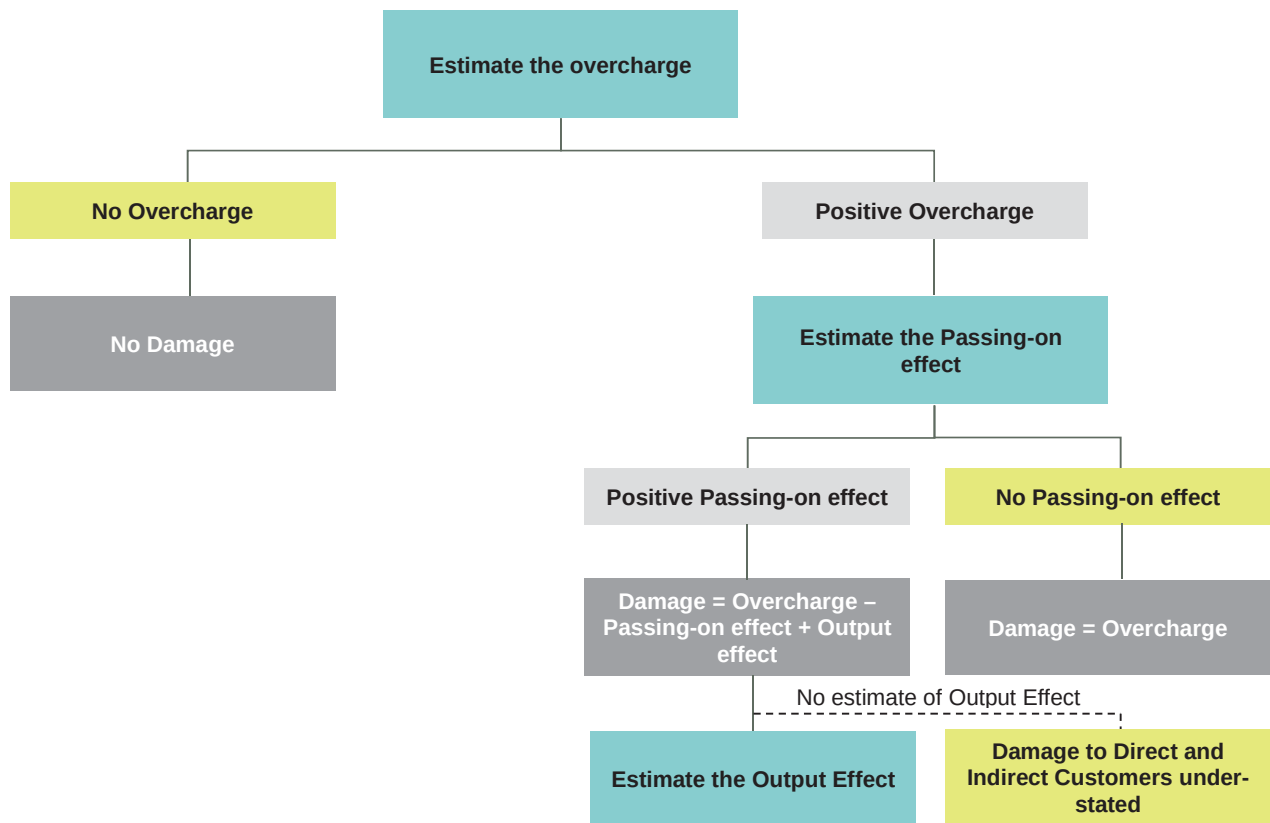
201. Note, in particular:

- In **Scenario 1**, the claimant – the Direct Purchaser – will have direct visibility of its affected purchases and purchase prices (although not - those of other consumers, and not necessarily of the full range of factors which may have caused the infringer’s prices to vary - such as other key cost drivers or supply and demand factors). Pass-on is relevant to the question of how the claimant has responded to the overcharge and may have the effect of reducing the overcharge suffered by the claimant. However, consequences of such pass-on further down the supply chain (in the Direct Purchaser’s sales) may not be directly observable by the defendant. There are many real examples of cases of this type, such as the *Spanish Sugar II* case (concerning direct overcharge claims by confectionery producers against Spanish sugar producers), where economic analysis relied on public information on market conditions to predict downstream pass-on (considered in [Section II.D.3](#) and **Box 5** above).

- In **Scenario 2**, the claimant is a first level indirect purchaser (Indirect Purchaser 1). As such, the initial upstream overcharge will not affect its purchases directly (but rather those of the Direct Purchaser) and Indirect Purchaser 1 may not have direct visibility of that upstream overcharge. Equally, Indirect Purchaser 1 may have little insight into the processes whereby the overcharge affects the Direct Purchaser's own prices, i.e. is passed on upstream. Nevertheless, Indirect Purchaser 1 will experience the direct effects of the upstream passing-on of the overcharge in the price it pays for the product or service it acquires from the Direct Purchaser. Pass-on by Indirect Purchaser 1 may not be directly visible to the defendant either. Examples of these types of situation have arisen in competition damages litigation pursued before the national courts in the EU, such as in the pending *Sainsbury's MIF Litigation* before the Competition Appeal Tribunal (CAT) in London (concerning claims for allegedly inflated card payments fees passed on by banks to merchants) (see further below **Box 21**).
- In **Scenario 3**, Indirect Purchaser 2 is a claimant further down the supply chain. The impact of the infringement on this claimant depends on the sequential impact of the original overcharge and passing-on by both Direct Purchaser and by Indirect Purchaser 1. However, whilst Indirect Purchaser 2 will experience the impact of Passing-on 2 directly, it may have little or no direct visibility of the contributions made by the overcharge and passing-on effects further 'upstream', or other confounding influences. This situation has occurred, for instance, for some indirect claimants in *UK Air Cargo*, where experts are suggesting empirical assessment based on full party disclosure (as to which see **Box 38** below).

202. A sequential approach to estimation of the three components of damage which may arise from competition infringements for claimant that are not end customers is set out in **Figure 9** below. Holistic approaches to quantification - quantifying different components simultaneously (e.g. the direct quantification of the passed-on overcharge paid by an indirect purchaser on its own purchases of affected products) - also offer valid alternatives and, in this sense, **Figure 9** is provided simply for schematic reference purposes.

Figure 9: Sequence of damage estimation



203. Approaches to compute each of the three components of damages are described in the sub-sections that follow, namely:
- a) IV.A.2. The overcharge
 - b) IV.A.3. The passing-on effect
 - c) IV.A.4. The volume effect
204. Sections IV.A.5 and IV.A.6 consider holistic approaches, namely the discount and simulation approaches respectively.
205. Section IV.A.7 contains a **summary and ranking** of the varying methods and approaches to quantification described in these three sub-sections, as well as a schematic **road map**. Readers may find the road map a particularly useful key to the description of methods and approaches which follows below.

IV.A.2. The overcharge

206. **Quantification of the overcharge will typically constitute the first step in the estimation of direct purchaser damages.** If the evidence indicates that there is no overcharge effect, this means that the passing-on defence need not be invoked and, therefore, there is no need to quantify the other two components.¹³⁰ Nor is there any basis in this case for establishing pass-on damages further downstream.
207. To estimate the overcharge the expert will have to determine the counterfactual (or 'but for') price that the supplier would have charged, and that the relevant (direct or indirect) customer would have paid absent the infringement. The difference between the actual and counterfactual prices, multiplied by the relevant volume of purchases, will give a measure of the magnitude of the overcharge in monetary terms.
208. A number of different methods can be employed to obtain an estimate of the counterfactual price and, hence, the unit overcharge; i.e. the amount by which the relevant price has been inflated as a result of the infringement. These methods are considered in some detail in the EC Practical Guide as

¹³⁰ It should be noted however, that a firm may be able to increase its own prices because a rival raises its prices in response to an overcharge. An indirect customer may therefore suffer harm as a result of pass-on even if its supplier does not suffer an overcharge. This result of this "umbrella" effect is not the focus of this Study, as noted in Section I.A. (although some consideration is given to the relevance of this potential effect in which can affect the selection a relevant benchmark when comparator based methods are used (see Section IV.B.2. below)).

well as in the report on quantifying antitrust damages prepared for the EC by Oxera.¹³¹

IV.A.3. The passing-on effect

209. A second step involves estimating the magnitude of the passing-on effect(s).

210. If the overcharge is positive, even if it is small, the question arises whether it has been passed on – at least to some extent – in the direct purchaser's own prices.¹³² As noted previously, if there has been a passing-on effect, this necessarily implies a volume effect; i.e. the passing-on and volume effects are intrinsically linked. In addition, pass-on also implies that the infringement must have affected customers further down the supply chain, giving rise to the potential for additional claims (by indirect purchasers).

211. If the evidence indicates that there is no passing-on effect at the direct purchaser level, then this means that there is no volume effect either, and the loss and damage for the direct purchaser is simply equal to the overcharge. Conversely, if instead the expert quantifies the volume effect and arrives at the conclusion that there is no evidence supporting this effect, this may suggest that there is no passing-on effect.¹³³ In such a case, there is also no further impact down the supply chain.

212. Analogous reasoning applies at subsequent stages in the supply chain, where the "overcharge" at a given stage corresponds to the passing-on effect at the stage immediately upstream. Hence if there is no passing-on effect at any stage, there will be no indirect damage further downstream.¹³⁴

213. In monetary terms, the passing-on effect can be computed by multiplying the relevant purchaser's price increase on the downstream market that results from passing-on the overcharge by the relevant purchaser's volume of sales (as illustrated in the following formula and in **Box 14**).

$$\text{Passing-on effect} = \text{Price increase} \times \text{Quantity sold}$$

¹³¹ Oxera: 'Quantifying Antitrust Damages', a study prepared for the European Commission, December 2009 ("**Oxera Report**").

¹³² See the 2014 RBB OFT Report.

¹³³ Note that if (aggregate) demand is quite inelastic (that is, quantities sold do not respond much to price changes), then the loss of volume that results from a price increase will be small. If the volume reduction is small, it might be difficult to detect statistically. In such a case, pass-on cannot be ruled out.

¹³⁴ Note however that there might be long run price effects through entry and exit as explained in [Section III.B.7](#), which may have to be taken into account at various steps of the supply chain, depending on the scope that is given to pass-on.

Box 14: Illustration - calculating the pass-on effect

A flower grower (direct purchaser) passes on an overcharge for air transportation services to indirect purchasers (flower stores). The passed-on amount (passing-on effect) is estimated to be €1 per standard bunch of flowers. The grower sells around 100,000 bunches of flowers a year. This indicates a total passed-on amount of about €100,000 per affected year of sales, which offsets (all or part of) the overcharge for air transportation services that the flower grower has incurred, with the consequence that this overcharge has been effectively transferred to purchasers further downstream.

214. Typically, as data on quantity sold may be readily available, **the main challenge is usually to estimate the price increase on the downstream market that results from passing-on the overcharge.** There are two main approaches to estimate this price increase on the downstream market: (i) the direct approach, and (ii) the pass-on rate approach. We present each in turn below, highlighting in broad terms their key features and their different requirements in terms of inputs.

IV.A.3.1 Direct approach

215. The passing-on effect(s) at various stages in the supply chain can be computed by **estimating directly the increase in prices** that has resulted from the impact of the initial infringement (possibly passed on through multiple stages in the supply chain). Alternatively, it is possible to derive the pass-on by estimating the extent to which the **purchaser's downstream margin has changed** because of the infringement. We discuss each approach in turn:

IV.A.3.1.a. Estimating the price increase directly

216. Experts can choose to estimate directly the seller's price increase that is caused by a cost increase of the affected input. This approach is analogous to that used to quantify the overcharge, but focusses on the prices charged by direct or indirect purchasers and paid by indirect purchasers immediately downstream. This method can thus be used both in the context of downstream pass-on and upstream pass-on. In particular, the expert can in this way assess the downstream impact of overcharges on indirect purchasers where the latter do not have ready access to information on either: (i) the overcharge to the direct purchaser, or (ii) upstream price formation.
217. To estimate the price increase that results from pass-on, **the main challenge is to determine the counterfactual price, p_0** , that is, the price that the seller would have charged and the indirect purchaser would have paid **'but for'** the infringement having taken place upstream. If sufficient data is available, the expert can estimate the difference between the

observed and counterfactual prices using the same methods as are used to compute the initial price overcharge, as described in the EC Practical Guide.¹³⁵ These techniques can be implemented to determine the price that the relevant seller would have charged, equivalent to the price the corresponding purchaser would have paid, had the seller's costs not been impacted by the infringement.

218. As with the estimation of the initial overcharge, the expert may consider using comparator-based methods to identify the passing-on effect. In simple terms, the expert attempts to make a comparison with a benchmark price that has been unaffected by the infringement to establish the counterfactual price.
219. The most basic empirical strategy to obtain an estimate of the counterfactual price would be to compare the average price before and/or after the infringement period with the average price during the infringement period (as illustrated in **Box 15** below). Depending on data availability, the expert may also consider using data on prices paid by indirect purchasers in similar markets that are, nevertheless, not affected by the infringement. Alternatively, the expert might use a so-called "difference-in-differences" approach which assesses whether the difference between the prices charged in affected and unaffected markets during the infringement period has also changed outside the infringement period.

Box 15: Illustration of direct estimation (basic comparator approach)

To obtain an estimate of how much the flower grower (direct purchaser) in our previous example increased its price to indirect purchasers, the expert applies a during/after approach. Suppose the flower grower sold 100 000 units during the infringement period at an average price of €20, then $q_1 = 100,000$ and $p_1 = €20$. The expert also collects data from the direct purchaser on the price it charged when it sold flowers after the infringement (alternatively, the indirect purchaser's expert could use purchase price data from the indirect purchaser if sufficiently complete). The expert computes an average price post-infringement of €19, which is used as a benchmark for the price the direct purchaser would have charged (and the indirect purchaser would have paid) in the absence of the infringement. The estimated increase in price due to the infringement is thus $(p_1 - p_0) = €1$. In this case, the passing-on effect (or overcharge for the indirect purchasers) is thus €100,000.

220. The example in **Box 15** above could also illustrate the analogous impact of passing-on by an indirect purchaser supplying goods or services further downstream.
221. This basic approach, however, may not provide a reliable measure of the true price increase caused by the infringement. This is because other factors that

¹³⁵ Ibid.

are not taken into account in performing a simple price comparison may affect prices in such a way that the observed benchmark prices cannot, in isolation, provide a reliable estimate of the price that would have been charged absent the infringement. Most obviously, the seller's costs may have changed between the periods before and/or after the infringement and the infringement period itself, such that its pricing of the affected products would have changed anyway between periods, even without the infringement. For example, if costs other than those affected by the infringement were greater outside the infringement period than during it, logically this could be expected to have increased the observed benchmark price. Failing to take account of the impact of such extraneous cost changes will tend to result in the passing-on effect being estimated with error.

222. The simple comparison described above is, therefore, liable to give inaccurate estimates of the passing-on effect whenever other confounding factors would also have resulted in changes in prices between the infringement and non-infringement periods. The better the estimation process is able to control for these other influences on prices, the more reliable will be the estimate of the counterfactual price and, therefore, the unit pass-on effect.
223. To address this problem, the expert may use regression analysis, a scientifically accepted method.¹³⁶ Specifically, the expert can set up a regression model to estimate statistically how much of the difference between the observed and benchmark prices is explained by the infringement, as opposed to potential confounding factors, as described above. For instance, the expert may include in the model these factors as explanatory variables, as well as a variable indicating the periods during which the infringement took place. The estimated coefficients on the various explanatory variables will provide a measure of the influence of each on observed prices.

IV.A.3.1.b. Inferring pass-on using margin data

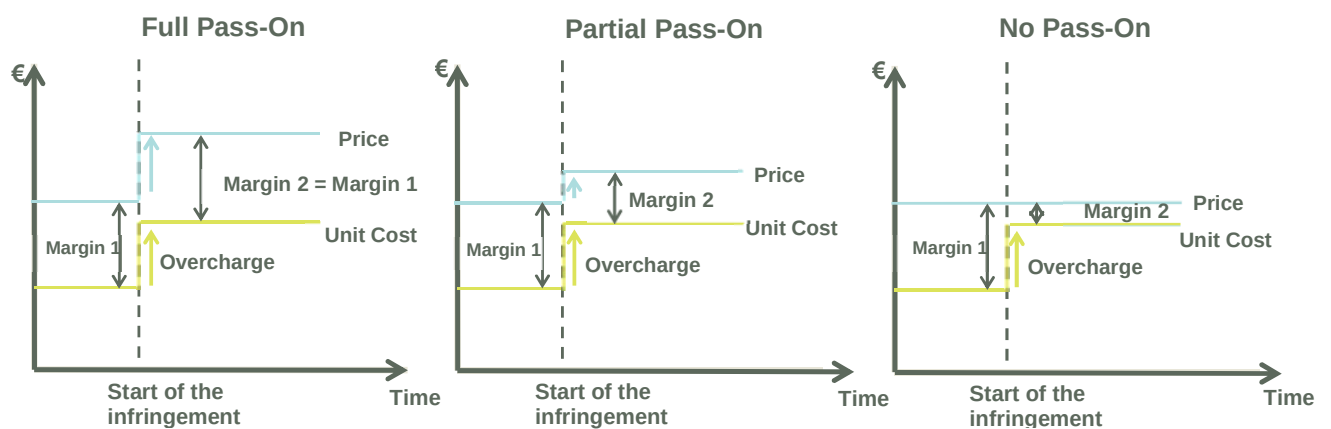
224. Subject to data availability, experts can compare the direct purchaser's unit margin (i.e., the amount, in monetary terms, by which price exceeds marginal cost) with a **counterfactual measure** to assess directly the net impact of the unit overcharge and passing-on effects.
225. If that mark-up is unchanged in absolute terms, this is evidence – all else being equal – that the purchaser passed on the overcharge in full. If, instead,

¹³⁶ See the EC Practical Guide for a short introduction of regression analysis and its requirements, notably paragraphs 69-90.

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the unit margin is narrowed by the impact of the overcharge, then this indicates that the purchaser absorbed at least some of that overcharge. Finally, if price does not change, while the margin is reduced by the overcharge, this shows that the purchaser absorbed all the cost increase. All these scenarios are illustrated in **Figure 10** below. On the other hand, if the mark-up has increased, this indicates that passing-on has exceeded 100%.

Figure 10: Profit margin and pass-on



Note: Margin 1 represents the margin *before* the infringement while Margin 2 is the margin *during* the infringement.

226. The table below summarises what a change in unit margin indicates with respect to pass-on, holding the effect of other factors (e.g. changes in unaffected input cost) constant.

Table 1: Unit margin and pass-on (all else equal)

Change in unit margin	Pass-on
Margin falls by the same amount as the overcharge	Purchaser absorbed the overcharge in full
Margin decreased	Purchaser passed on part of the overcharge and absorbed the rest
Margin stayed constant	Purchaser passed on the overcharge in full
Margin increased	Purchaser passed on more than the overcharge

227. To establish the extent to which the relevant purchaser's margin has changed, experts can deploy the same comparator-based techniques that can be used to estimate directly the price increase. Specifically, the expert may proceed by comparing the observed unit margin, m_1 , as affected by the infringement with a benchmark margin, m_0 , which proxies for the margin that would have prevailed 'but-for' the infringement. This approach would, naturally, involve identifying a suitable benchmark. However, as already indicated above (see paragraphs 221-223), the expert will have to control for the influence of confounding factors that also affect the unit margin. For instance, if the expert compares the purchaser's downstream unit margin in the period of infringement with that outside this period, changes in costs or in downstream pricing over time that are not related to the infringement may blur the comparison.
228. The expert can then use the result of this margin comparison to estimate the price increase that is caused by the infringement. Equipped with a measure of the unit cost change ($c_1 - c_0$), for the relevant purchaser, which may have been obtained in establishing the magnitude of the overcharge, the expert simply adds the change in unit margin to estimate the seller's price increase (as further illustrated in **Box 16**).

Box 16: Illustration - direct estimation (unit margin approach)

Suppose that the expert in the previous flower grower example finds that the unit margin of the flower grower was reduced by €1 (i.e. $m_1 - m_0 = -1$) as a result of the overcharge. This indicates that all or part of the overcharge has been absorbed. However, to establish exactly the extent of the pass-on, the expert must also take into account how the overcharge affects marginal cost. Consider that the cost increase due to the overcharge is €2 (i.e. $c_1 - c_0 = 2$), then the direct purchaser absorbed part of the overcharge but its price increased by €1 (i.e. $(m_1 - m_0) + (c_1 - c_0) = -1 + 2 = 1$). Instead, if the margin had stayed constant, this indicates that the flower grower passed on the overcharge in full and, accordingly, indirect purchasers further downstream suffered the overcharge.

IV.A.3.2. Pass-on rate approach

229. Another option consists of obtaining an estimate of the rate at which the increase in the affected input cost will have been passed on (i.e. the pass-on rate) and then applying this rate to the relevant overcharge to obtain an estimate of the increase in price.¹³⁷ Put simply, if the pass-on rate is estimated to be 50%, i.e., if half of the absolute amount of the overcharge

¹³⁷ As explained in [Section III](#), when the overcharge affects the purchaser's fixed cost, it is unlikely to be passed on, at least in the short term.

is passed on, then if the overcharge is €10, the purchaser subject to the overcharge increases its price downstream by €5.¹³⁸

230. This approach requires two inputs, namely: (i) a measure of the overcharge that is converted into terms of unit cost increase of the relevant purchaser, $(c_1 - c_0)$, and (ii) a measure of the relevant pass-on rate, τ (as reflected in the following formula).

$$\text{Price increase} = (c_1 - c_0) \times \tau$$

231. An estimate of the unit overcharge $(c_1 - c_0)$ may already have been obtained in establishing the magnitude of the overcharge, whether in other proceedings or by virtue of access to disclosure of the infringers' relevant data (although neither of these may be given or simple). Assuming that the magnitude of the upstream overcharge can be ascertained, it will still be necessary to translate this overcharge measure into the unit cost of the direct purchaser's output in cases where units of the affected input do not get transformed on a one-for-one basis into units of the direct purchaser's output.¹³⁹ If the direct purchaser is a retailer or a distributor, typically one unit of the input purchased will correspond to one unit of the output that is sold. Therefore, if the initial overcharge is €5, the distributor's unit cost is elevated by €5. If, instead, the direct purchaser is a manufacturer that uses the affected input as part of a more complex production process, the increase in unit cost will depend on the relevant technology. For example, if it takes 3 units of the affected input to manufacture one unit of output, the unit cost of that output will be raised by €15 (€5 x 3) in this case.
232. Analogously, measures of the cost "overcharges" imposed on indirect purchasers downstream may be obtained from estimates of passing-on effects, where these are available. In this case, passing-on effects further downstream may then be obtained by combining these estimates with measures of the relevant pass-on rates in the same way as for the original overcharge (as illustrated in **Box 17** below).

¹³⁸ This may involve a sequence of several passing-on effects, as illustrated by Scenario 3 in **Figure 8: Passing-on scenarios** above. In that case, the overall impact on the price paid by Indirect Purchaser 2 will depend on the way in which the original overcharge is passed on at two successive stage in the supply chain.

¹³⁹ See **Section III.B.3** below.

Box 17: Illustration – use of historical pass-on rates

The expert has quantified the initial unit overcharge at €20 and one unit of input is used by the direct purchaser to produce each unit of output. The expert also has evidence that, in the past, the direct purchaser has passed on half of any marginal cost changes. The estimated pass-on rate is thus 50%; i.e. $\tau=50\%$. Purchases of the affected input contribute 40% of the direct purchaser's total marginal cost at current prices. For every €100 of marginal cost, €40 is thus spent on the input affected by the overcharge. In this case, a €10 change in the price of the affected input causes the purchaser's marginal cost also to increase by €10, of which €5 is passed on.

Note that in this example, the purchaser's marginal cost increased by 20% ($20\text{€}/\text{€}40$), the affected input accounts only for 40% of total marginal cost. So, when considered in percentage terms, the input cost which increased by 50% is multiplied by 40% (its proportion of total marginal cost), which equals 20%.

233. In **Box 17**, the expert relies on a measure of the pass-on rate but in some cases the expert may estimate a pass-on elasticity. The pass-on elasticity gives the percentage increase in price arising from a 1% increase in cost.¹⁴⁰ In this case, that elasticity would have to be scaled by the proportion of marginal cost for which the affected inputs accounts. We illustrate the mechanics in **Box 18** below.¹⁴¹

Box 18: Illustration – use of pass-on elasticity

Consider that in the case contemplated in **Box 17** above, the expert has found that the pass-on elasticity is 0.5, which implies that for every 1% increase in marginal cost, price will rise by 0.5%. In this case, as marginal cost is raised by 20% ($50\% \times 40\%$), the price would be elevated by 10%.

234. **The key empirical challenge associated with this approach is to obtain a measure of the relevant pass-on rate.** That is, how much of the cost increase caused by the infringement can be expected to have been passed on to the prices at issue. In principle, there are a number of different ways of obtaining a measure of this rate. In practice, the approach adopted and the reliability of the results obtained will depend on the amount and quality of data and/or information available. In particular, some of these approaches are more quantitative and others more qualitative in character. The expert can – and typically will – use evidence from a variety of sources of cost variation and the resulting price responses to estimate the firm's pass-on rate. The results of these approaches will normally need to be compared, and they may well be granted varying evidentiary weight by national judges.¹⁴²

235. We classify the various approaches as follows in the sub-sections below: (a) empirical approach; (b) direct evidence of a firm's pricing policy; (c)

¹⁴⁰ See the 2014 RBB OFT Report.

¹⁴¹ In evaluating this evidence, it will be relevant to consider whether pass-on rates in response to past changes in marginal costs can be expected to translate to the specific setting under consideration.

¹⁴² See, for further discussion of evaluation by courts of different types of evidence, [Section V.B](#) below.

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reference approach; and (d) theory-based approach. We conclude, in (e), by discussing the possibility of comparing results of various approaches.

IV.A.3.2.a. Empirical approach

236. The expert may collect price and cost data to develop a quantitative analysis of how changes in a firm's costs have affected its prices.
237. Using data, the expert may assess the statistical relationship between the prices charged on the downstream market by the affected firm(s) and: (i) the price of the input that is the object of the infringement; (ii) the price of other inputs that impact on marginal costs; or (iii) cost data that serve as a proxy for marginal cost. In the latter two cases (ii) and (iii), the expert assumes that the relevant purchaser would pass on the overcharge in equal measure to any other marginal cost increase.¹⁴³ Note also that under (i) and (ii), the expert analysis is based on input price data, whilst under (iii), accounting cost data will typically be used, notably on variable cost.
238. Subject to data availability, the expert could simply analyse the extent of any correlation between the price of the input in question and the price on the downstream market, for example. On the other hand, he or she could consider developing a regression analysis to quantify this relationship. Regression analysis in this case implies that the expert specifies an econometric model, whereby the extent to which changes in the prices charged by the seller in question are explained by changes in the price of the relevant input or that seller's marginal cost is estimated.¹⁴⁴ **Box 19** contains an illustration of how regression results can be used to calculate pass-on effects.

¹⁴³ In evaluating this evidence, it will be relevant to consider whether pass-on rates in response to past changes in marginal costs can be expected to translate to the specific setting under consideration. It is also important to understand the limitations of cost data (see [Section V.B.1.3](#) and [Section C](#)). Note on the use of aggregated data to infer causal relationships [Section V.A.C](#).

¹⁴⁴ Subject to the availability of relevant data, the expert might also assess the relationship between a firm's prices and changes in a supplier's costs. For example, the expert might seek to assess the impact of significant changes in the infringer's costs (e.g. due to raw material price changes) on prices several stages removed along the supply chain.

Box 19: Illustration of empirical approach to estimating pass-on rate

An expert's regression analysis yields an estimated relevant pass-on rate of 80% - that is 80% of any change in the firm's marginal cost is passed on. Analysis of the firm's costs indicates that it paid an additional €5 for each unit of an input as a result of the infringement, and that it takes 4 units of the input to make one unit of the product sold downstream. In turn, this indicates that the marginal cost to the firm of producing an extra unit of output was increased by €20 as a result of the infringement. Given the estimated pass-on rate of 80%, the expert estimates the unit pass-on effect to be €16.¹⁴⁵

239. Other factors will affect the purchaser's prices too, notably changes in the demand for its products on the downstream market. If the expert omits to account for the potential influence of these confounding factors, he or she may attribute wrongly some of their effect on prices to the overcharge. For example, if demand for the product at issue is seasonal, prices tend to be higher in the high season when consumer demand peaks. If relevant costs also increase during the high season, then failing to take into account the seasonal pattern of demand would result in the impact of high demand on price being attributed instead to the cost changes, thereby overstating the pass-on rate. To alleviate this distortion, if there is enough data, it may be possible to develop a regression analysis capable of accounting for the influence of confounding factors.

IV.A.3.2.b. Evidence of a firm's pricing policies

240. In reality, there is a raft of pricing policies, of many different types that firms can adopt, some of which may be specific to the industry in which they operate. These can range from sophisticated algorithms that take into account a multitude of market factors to more intuitive approaches.
241. In some cases, a firm may have a clear policy or established practice which identifies the price adjustments that will result from specific cost changes. In the extreme, a firm may even adjust its prices mechanistically in response to given changes in its costs. For instance, contracts with customers may stipulate precisely that if the cost of an important input is increased or decreased (sometime beyond a certain threshold), the price will be adjusted accordingly.¹⁴⁶
242. Wholesale supply contracts or intra-group pricing policies may establish pricing with reference to underlying cost. This was, for instance, argued in the Electrical Carbon Litigation brought by a number of European rail

¹⁴⁵ This assumes that all inputs have a pass-on rate that is proportional to their contribution to marginal cost, an assumption that may need to be tested.

¹⁴⁶ Cost plus pricing is one of the exceptions to the exclusion of indirect purchaser claims provided for in US Federal law, *In re ATM Fee Litigation* (see [Section II.B](#)).

companies before the Competition Appeal Tribunal in London (the “CAT”).¹⁴⁷ Specifically, the pricing of certain spare parts which fell within the scope of the cartel and which were sold to certain claimants through a wholesaler (a division of British Rail -the former state-owned operator of the railways in Britain- both before and after privatization) was alleged to have been subject to a mechanical mark-up on the cost charged by the cartelists, such that upstream pass-on to the claimants would have been total. For the pre-privatization period, this required documentary, IT and witness evidence to be produced and analysed on applicable mechanisms and systems in place within British Rail for the imputation of costs between different operating divisions in the late 1980s and early 1990s.

243. In other cases, the firm may seek to achieve certain performance objectives. For example, a retailer or a distributor may apply a specific mark-up (either in absolute or in percentage terms) to the pricing of individual products they supply. In principle, such a policy suggests that they would pass on cost changes. For example, the direct purchaser may seek to maintain a constant absolute mark-up between price and marginal cost, which would imply that if marginal cost increases by €1, the relevant purchaser will raise price by €1 too, in which case the pass-on rate is simply 100%.¹⁴⁸
244. In many other settings, prices are not directly related to movement in costs, or particular costs. Some companies may establish price lists that may be revised annually, but at the same time, offer individual, undisclosed discounts to their customers, depending in particular on volume purchase and the state of competition. Companies may, for instance, monitor the pricing of competitors and adjust prices in response to rivals’ price movements amongst other factors. Even then, although costs may not always prominently feature in firm pricing policy documents, cost movements may nevertheless still affect price levels.
245. In *EKKO* (2002) (see **Box 20** below), the Danish Maritime and Commercial Court appears to have relied partly on the fact that the claimant did not include a specific price head for the cost fee at issue and that it continued to apply the same list price. However, in and of themselves such facts may not be conclusive; whilst its list price remained constant, the claimant may have stopped offering any discount to its customers, which amounts to raising prices.

¹⁴⁷ See *Deutsche Bahn & Ors v. Morgan Crucible & ors* (Case 1173/5/7/10 before the CAT). The claims were withdrawn prior to judgment, so no decision is available (on the issue of pass-on or otherwise).

¹⁴⁸ If the firm seeks to maintain a constant percentage margin over marginal cost, then the pass-on *rate* exceeds 100%; the pass-on *elasticity*, on the other hand, is 100% (because to maintain a constant percentage mark up over marginal cost, price must be increased by the same proportion as marginal cost).

Box 20: EKKO (2002)

Maritime and Commercial Court, Case no. V 15/01, *EKKO A/S v. Brandt Group Norden A/S, AM Hvidevarer A/S, GRAM A/S*, judgment of 3 October 2002

In February 2001, EKKO, a domestic appliance wholesaler, brought a follow-on damages action against three suppliers of domestic appliances following a decision of the Danish Competition Authority. Between 1998 and 1999 EKKO had purchased domestic appliances from a number of domestic appliance suppliers through a certain member of a purchase association. By purchasing the domestic appliances through the member of the purchasing association, EKKO was able to obtain the same prices and bonuses as the members of the association. However, the suppliers entered into concerted practices to charge an additional fee of 100 DKK (approx. €13) when selling domestic appliances to EKKO through the member of the purchase association. Members of the association were not charged the same fee. The Danish Competition Authority found that, by imposing this fee, the suppliers had unlawfully discriminated against EKKO in breach of competition law and ordered them to bring the infringement to an end.

In their defence to EKKO's damages action, the suppliers claimed that EKKO had passed on the fee to its customers. EKKO responded that it was not possible to pass on the overcharge to its customers as it had a market share of only 2% and was operating in the context of fierce competition. EKKO argued that an increase in prices corresponding to the additional fee would have led to loss of customers because none of its competitors were subject to the cost fee.

The Court found that EKKO's damages claim was justified and that EKKO was entitled to damages for the loss suffered due to the infringement of competition law. Furthermore, the court briefly stated that EKKO had proved that the fee had not been passed on to its customers. On this ground, EKKO was awarded damages corresponding to the full overcharge.

Although not expressly stated in its judgment, the Court appears to have relied on several witness testimonies which evidenced the inability to pass-on due to the intense competition from companies not subject to overcharges. In particular, a customer testified that EKKO had not charged the extra fee because the customer could have switched to non-affected rival suppliers. This in combination with the low market share of EKKO, appear to have swayed the Court. In addition, it appears that the court placed some weight on the fact that the claimant's invoices (furnished in evidence) did not include a specific head for the cost fee and that its lists of prices during the infringement period evidenced that it had not increased its prices.

246. Accordingly, in assessing pricing policy evidence, it will be important to establish if and how such policies have been implemented in practice, preferably by examining pricing data to determine whether these correspond to the pricing policy in question.

IV.A.3.2.c. The reference approach

247. When there is no sufficient data to estimate empirically a pass-on rate that is specific to the case in hand, the expert may consider whether estimates from other sources could provide a reasonable proxy for the rates in question. There is inevitably a risk in this scenario, however, that the adopted estimate may relate to circumstances that do not fit those of the case at hand. Key issues in evaluating analysis based on such estimates are:

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(i) the reasonableness of the estimate in question as a measure of pass-on in the case in hand; and (ii) the sensitivity of any results to potential differences between the actual pass-on rate and the estimate in question. Arguably, the latter condition might be difficult to evaluate in practice.

248. The expert may attempt to use insight from economic theory to adjust the estimated pass-on rate in order to match better the pass-on rate which would be expected given the relevant features of the case at issue. However, in general, it may be best to deploy such insight only to indicate whether the available estimate is likely to under-state or to over-state the true value.

249. The expert may obtain an estimate of the pass-on rate from a variety of sources, which may be based on internal documents or from outside sources. The following situations provide illustrations:

- The expert may use anecdotal evidence of the way a firm has adjusted prices to substantial cost shocks in the past, e.g. as recorded in various internal documents;
- The expert may obtain an estimate of the relevant pass-on rate from academic or other studies of the same or a similar industry;¹⁴⁹ or
- The expert may use the pass-on rate from another case in the same industry; or
- The expert may rely on evidence provided in witness statements.

250. Witness evidence of pricing practices can play an important role in the adjudication of pass-on issues in EU national competition litigation (and may of course be of relevance to approach (b) considered above). During the UK High Court trial in *Cooper Tire* relating to the effects of the Synthetic Rubber Cartel, the English judge had the opportunity to hear witnesses of fact from the claimants, who were called to give evidence in relation to the pass-on of synthetic rubber costs. The focus of this evidence was the rationale behind the various claimant companies' pricing. Finally, the case ended in settlement and there is no means of knowing how the judge would have dealt with the evidence. Witness evidence also apparently played a relevant role in the Danish case *EKKO* (2002) (see **Box 20** above).

251. An approach of a reference type seems possibly to have been adopted in the *Sainsbury's MIF Litigation*, pending before the CAT in London at the time of writing, as regards the downstream pass-on defence raised by MasterCard

¹⁴⁹ Estimates based on general industry experience is unlikely to be as pertinent as firm-specific evidence.

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(see **Box 21** below). Such an approach could apparently have been influenced by the difficulty in carrying out meaningful empirical analysis in the particular circumstances of that case.

Box 21: Sainsbury's MIF Litigation

***Sainsbury's Supermarkets Ltd v. MasterCard Incorporated and Others*, Case number: 1241/5/7/15 (T), before the CAT**

This case concerns a claim for damages brought in respect of an alleged infringement of the Chapter I prohibition in the 1998 UK Competition Act or the prohibition in Article 101(1) TFEU. The alleged infringement concerns the multilateral interchange fees (MIFs) set by MasterCard which are alleged to have caused harm to Sainsbury's by increasing excessively the Merchant Service Charges (MSCs) paid by it to its acquiring bank with respect to MasterCard card payment transactions carried out in its supermarket stores by its customers.

The proceedings were transferred from the High Court to the CAT by order of Mr Justice Barling dated 1 December 2015. The trial took place over 23 days between 25 January 2016 and 16 March 2016.

MasterCard raised the passing-on defence to Sainsbury's claim, claiming that Sainsbury's had passed on 100% of any overcharge - a defence which Sainsbury's denied entirely. While part of the trial took place in camera without public access, from publicly available information, a number of points can be made as to the arguments which the parties have raised as to pass-on. These include:

- Given the data available and the small input cost represented by MIF variations in retail prices set by the claimant, it was not possible for the defendants' economists to carry out robust empirical assessment of pass-on.
- Both sets of experts looked to economic theory to support their opposing positions but could not agree on the consequences.
- The defendants' expert looked to alternative markets to draw inferences for the retailer market where the claimant operates, while recognizing the preference for specific analysis of the market in question where possible.
- Some debate centered on public statements by the defendants and retailers in the context principally of the administrative investigation of MIFs as to the existence of not of pass-on, which were potentially detrimental in some cases to the parties' position in the damages litigation.
- There was some suggestion by the experts for MasterCard that the pass-on of the alleged overcharge could have taken the form of a downgrading of quality, as opposed to increased prices, while admitting that quantification of such an effect in financial terms was not possible.

Judgment in this case was pending at the time of writing.

252. In some instances, the pass-on rate estimates available to the expert may have to be adjusted to correspond to the case at hand as illustrated in **Box 22** below.

Box 22: Illustration of the reference approach to estimating pass-on rates

An expert identifies an external study that quantifies the impact of a past tax change on prices, which thus gives a measure of the industry-wide pass-on rate. Specifically, the study shows that firms raised prices by €4 on average, while they had to pay an extra €6 in taxes for each unit sold. This suggests an industry-wide pass-on rate of 2/3. However, suppose that the infringement at issue had an impact on only some competitors. This means that the pass-on rate from the study will over-state the relevant value (because, for the same size of cost change, firm specific or group specific shocks typically give rise to lower pass-on than an industry-wide cost change).¹⁵⁰

253. Information regarding the extent of competition may then provide a guide as to how much to adjust the pass-on rate downwards, or at least facilitate in identifying bounds on the size of the pass-on effect.

IV.A.3.2.d. Theory-based approach

254. In some cases, the expert may not have enough data or relevant and ready-to-hand information to estimate a pass-on rate, or the expert may not have access to a relevant and reliable empirical estimate. In this context, the expert may resort to insight based purely on economic theory to offer at least some broad guidance on the plausible extent of pass-on (although economic theory alone may well be insufficient to establish causation as a matter of law).
255. Economic theory offers predictions about how firms may be expected to respond to an overcharge in specific circumstances (see [Section III.B](#)). In particular, it predicts how firms can be expected to adjust their prices in response to changes in their input costs. (Theory also offers predictions on how competitors' prices will respond to changes in rivals' prices.) Those predictions will usually depend on the firm's cost structures, as well as the character of the market environment in which the firm in question operates, notably:
- whether the shock is firm-specific or industry-wide;
 - the relationship between a firm's outputs and its costs;
 - the nature of competitive interaction;
 - the intensity of that competition; and
 - the curvature of demand.
256. If the expert can establish, e.g. on the basis of the factual evidence, the conditions which are relevant to the case in hand then, in principle, he or she

¹⁵⁰ See [Section III.B.2.](#) above

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may be able to draw on economic theory to deliver a credible range for the extent of passing-on, and of the impact that this has on the damages resulting from an overcharge.

257. However, if the predictions of economic theory are sensitive to the values of parameters that cannot easily be identified with precision in practice, then the predictions themselves are likely to be equally imprecise.

258. Two issues in particular can be highlighted:

- First, the way in which the economist chooses to characterise markets in which a few large firms compete can have a profound bearing on the predictions for passing-on that result. The two paradigmatic models of imperfect competition most often deployed by economists are the so-called 'Bertrand' and 'Cournot' models. Crucially, whilst firms are assumed to set prices in a 'Bertrand' model, and to choose quantities in a 'Cournot' model, these distinctions do not necessarily translate in a straightforward way to real world differences.
- Second, theory predicts that the curvature of demand, i.e. how the slope of the demand curve changes as output/price varies, will generally affect the rate of passing-on in imperfectly competitive markets (i.e. monopoly and oligopoly markets).¹⁵¹ However, in practice, information on the curvature of demand is rarely available. Indeed, in estimating demand, economists will often assume a particular functional form for the demand curve (e.g. linear demand or isoelastic demand), and this assumption will dictate a particular curvature.¹⁵²

259. Hence, theoretical predictions may sensitively depend on parameters which are not easily identified in practice.

260. In certain cases purchasers may compete in markets with many other small rivals (the supply-side may be viewed as atomistic). In such a situation, the market might more closely resemble the textbook case of perfect competition. In that particular setting economic theory can provide relatively precise predictions. In settings which approximate textbook perfect competition and when the supply-curve is flat, the passing-on of industry-wide cost changes is predicted to be 100%. Note however that when the supply-curve is upward sloping (i.e. each unit of output becomes more costly as output expands) the pass-on rate is predicted to be less than 100% (for more details see [Section III.B.4](#)). On the other hand, the pass-on of firm-

¹⁵¹ See [Section III.B.5.1](#).

¹⁵² See [Section III.B.5](#) above.

specific cost increases will be zero in this same setting. (See further [Section III](#) above).

261. In the Danish case *Cheminova* (see **Box 23** below),¹⁵³ the judicially appointed expert relied principally on insights from economic theory. He referred to public market studies that pointed to the absence of competition. Then, drawing on predictions for the monopoly case with linear demand, the expert adopted a pass-on rate of 50%.

Box 23: *Cheminova* (2015) – pass-on effect

Maritime and Commercial Court, Case no. U-4-07, *Cheminova A/S v. Akzo Nobel Functional Chemicals BV and Akzo Nobel Base Chemicals AB*, judgment of 15 January 2015.

Cheminova, a Danish chemical company, produced a pesticide called dimethoate that contained monochloroacetic acid ("MCAA"). This pesticide was used by agricultural producers to control plagues. After the European Commission's decision which found that Akzo Nobel participated in the MCCA cartel in 2005, Cheminova brought a damages action against the company for the overcharges allegedly paid in the purchase of MCCA between 1984 and 1999.

The Court found that Cheminova had passed on 50% of the overcharges to agricultural producers. This conclusion was based principally on the report submitted by the judicially-appointed expert, who, in turn, based his findings on insights from economic theory and by references to publicly available information. According to the expert, limited data was provided by the parties.

In the view of the judicially-appointed expert, the evidence showed that there were no real cost-effective alternatives to dimethoate during the period of the infringement. In addition, academic studies characterised chemical markets as markets with monopolistic competition which gave manufacturers "price-setting leverage and thus leads to a mark-up of prices over variable costs". As a result, and based on economic theory, the expert concluded that Cheminova had passed on 50% of the overcharges because the pass-on rate in markets with limited competition between different products and variants tends to be around 50%. The expert, however, acknowledged that the pass-on rate could actually be lower or higher. The expert noted that the existence of high contribution margins and a high cost-price correlation supported his conclusion, but his findings did not rely on these observations because of reliability concerns about the data and because the parties did not agree as to whether the data could be used.

During the course of the proceedings, Cheminova produced a report to rebut the conclusions of the judicially-appointed expert. In particular, the report concluded that dimethoate competed with other pesticides. This was mainly evidenced by the large number of competing products in the market and moderate market shares. Because the competing pesticides in the market were not affected by the cartel, Cheminova argued that it could not have passed on the overcharges.

The Cheminova report did not, however, succeed in altering the judicially-appointed expert's conclusions. The latter found that the number of products competing with dimethoate was not, in fact, high in situations where the agricultural producers had to choose a pesticide for a

¹⁵³ *Cheminova* (2015).

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specific bug in a specific crop on a specific soil in a specific weather situation. In addition, he found that the highly aggregated market shares presented in Cheminova's report hid exceptionally large fluctuations in market shares of pesticides on local markets from year to year. The expert found that these large fluctuations could be explained by factors other than price competition such as the differing product properties.

IV.A.3.2.e. Comparing various approaches

262. Experts may use several of the approaches described above in parallel to arrive at a pass-on rate.¹⁵⁴ For example, in the US, experts will normally contrast insights from economic theory, supported by facts, with empirical analysis (generally through regression analysis). A good example is *In re CRT Litigation* (see **Box 24** below).

Box 24: *In re CRT Litigation* (2013)

***In re CRT Antitrust Litigation*, 3:07-cv-05944-SC Dkt. 1950 (N.D. Cal. Sept. 24, 2013)**

In *CRT*, a nationwide direct purchaser class action and 22 state-wide indirect purchasers' class actions have sought damages in the United States against a number of companies who had allegedly conspired to fix prices of CRTs (a component of televisions and monitors) worldwide over different time periods between 1995 and 2007. After having engaged in broad pre-certification discovery both the direct and indirect purchaser classes moved for class certification. Defendants challenged the proposed class certification on, *inter alia*, predominance grounds and sought to strike out the claimants' expert report. The court ruled in favour of the claimants and hence certified the classes. After certification was granted, the parties reached a settlement agreement totalling \$576.75 million. At the time of writing, the settlement was still pending final approval from the court.

To prove that the inflated price of CRT had been passed on to indirect purchasers (end consumers who purchased televisions and monitors) the claimants' expert relied on both qualitative and quantitative evidence. First, *inter alia*, the expert concluded that economic theory suggested a very high pass-on rate (close to 100%) because overcharged CRTs resulted in an industry-wide cost increase and each stage of the supply chain was highly competitive, a finding corroborated by market studies. The claimants' expert also relied on disclosed documentary evidence which anecdotally demonstrated that the defendants routinely monitored retail prices of CRT products (i.e. televisions and computer monitors). This, she argued, proved that the defendants were aware of the connection between the price charged to direct purchasers (e.g. OEMs) and the amount paid by ultimate consumers.

To quantify pass-on, the claimants' expert used regression analysis, which was based on a large amount of data, notably data obtained from third-party via subpoenas and from defendants. Specifically, the expert regressed the price at the lowest point of the distribution channel on the cost at the highest level of that channel. The expert ran 40 separate pass-on analyses. For example, she conducted three regression analyses for sales of CRT products at

¹⁵⁴ As discussed further in the guidance section of this Study, [Section V](#), national courts will normally be required to weigh up different types of evidence to assess the existence of pass-on, bearing in mind the limitations of evidence available and the different weight and reliability that can be assigned to each particular piece of evidence.

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Wal-Mart stores. She also ran separate analyses for brick and mortar retailers.¹⁵⁵ Overall, she used data on sales of more than 131 million tubes and CRT products sold across all levels of the distribution chain.¹⁵⁶ The claimants' expert used two approaches: a top-and-bottom approach (using as dependant variable the price paid by end-users as the retail level) and top-to-bottom approach (incorporating data from multiple levels of the supply chain). The first yielded a pass-on rate of 127%; the second, a rate of 102%.

The claimants' expert's conclusions were severely disputed by the defendants' expert. Qualitatively, the defendants' expert, *inter alia*, claimed that pass-on rates could not be proved by common evidence because products which incorporate CRTs vary substantially and are subject to different market forces, which explains why prices varied significantly across products. In addition, it was alleged that pass-on was not uniform at all times during the relevant period and that some intermediaries may not have passed on their costs at all; i.e., the overcharges were not passed through all stages of the complex distribution chain.

Quantitatively, the defendants' expert ran a separate regression analysis reaching different conclusions to the claimants' expert. It was argued that the claimants' expert's regression did not control for important differences in products and market changes, and that a correctly specified regression resulted in lower pass-on rates. One of the main critiques of the claimants' expert's approach was the inappropriate use of averages and aggregated data. According to the defendants' expert, the claimants should have estimated the pass-on on a transaction-by-transaction basis rather than using average prices. This was because consumers may have paid different prices for the same product depending on the time of the purchase or for a variety of other reasons (e.g. the presence of discounts, etc.) and therefore some may have been harmed by overcharges while others may have not.

The court however rejected this argument on the basis that the claimants' expert had in fact accounted for these variations. It was its view that, regardless of whether the price paid was the cartel target price or a price which deviated somewhat from that agreed level, all prices embodied a basic overcharge. As a result, estimating the overcharge or the pass-on would not require individualized inquiry. Unlike other cases in which this approach has been rejected,¹⁵⁷ the court found that CRT prices were not so variable because CRTs were not highly customized products and prices depended on a small set of variables that the expert took into account in the analysis.¹⁵⁸

¹⁵⁵ Some of the entities that provided data were CRT monitor manufacturers and retailers such as Wal-Mart, Best Buy or Amazon.com.

¹⁵⁶ To analyse the different effects of different CRT characteristics, the expert also conducted a hedonic regression analysis in which she incorporated documentary proof of the Defendants' target prices and the principal characteristics of CRTs (size, shape, type of customer and whether CRT was sold as input or final product). The expert found that 90% of price variations depended on these characteristics and so that there is a common pricing structure for different CRTs models. (But note that a similar hedonic methodology was rejected for not being sufficient to prove class-wide impact for indirect purchases in *In re Optical Disk Drive Litigation*.)

¹⁵⁷ See e.g. *In re Graphics Processing Units Antitrust Litigation*, 253 F.R.D. 478, 491 (N.D. Cal. 2008) ("***In re Graphics Processing Units Litigation***") and *In re Optical Disk Drive Litigation*.

¹⁵⁸ Another distinguishing factor in the CRT case was the size of the component part. CRTs make up a large share of the price of the television or monitor finished product, while graphic processing units and optical disk drives make up a small share of the price of a computer. Thus, the court in *In re Optical Disk Drive Litigation* held that "IPPs have not presented a persuasive explanation as to why it would be reasonable to assume a uniform pass through rate given that ODDs typically make up a relatively small portion of the cost of the products into which they are incorporated, and given the existence of price points—i.e., the common practice in the industry of selling products costing in the hundreds of dollars at prices just under the next \$100 mark. Thus, for example, if the overcharge paid by the direct purchaser on an ODD installed in a computer was only a few dollars, it seems

The defendants also took issue with the amount of data used by the claimants' expert, which they referred to as "relatively small". The court however found this allegation unconvincing, since the claimants' expert included over 40 data sets from 29 different entities representing sales of more than 131 million CRTs that covered transactions beginning as early as February 1994 and continuing to November 2011, and incorporating over 100 million price and cost observations. As the court put it, "this data certainly is not 'tiny' or 'unrepresentative'".

IV.A.4. The volume effect

263. A third step in the full quantification of damages is to estimate the magnitude of the volume effect. To date, limited attention has been paid to this head of EU damage claims, such that estimates of damages are often based on a quantification of the overcharge and passing-on effects only. **When passing-on is taken into account but not the volume effect, this has the effect of understating the true harm.**

264. The output effect is calculated by multiplying the counterfactual unit profit margin by the change in quantity sold.

$$\text{Volume effect} = \text{Counterfactual Margin} \times \text{Change in Quantity}$$

265. **The key challenge is to estimate the counterfactual margin and the reduction in quantity sold by the claimant.** The quantification of this component requires more inputs and, as a result, it may be more challenging to estimate than the other components. Depending on the types of inputs available, the expert has the choice of different approaches to quantify the volume effect. We consider the following three approaches below: (1) The direct approach, (2) the elasticity approach, and (3) the counterfactual volume approach.

IV.A.4.1. Direct Approach

266. The lost profit associated with the volume effect can be computed directly by multiplying the margin that the customer would have earned in the absence of the infringement - that is, the counterfactual margin - by the reduction in sales volume that results from passing-on the overcharge.

$$\text{Volume effect} = (p_0 - c_0) \times (q_1 - q_0)$$

267. This approach requires information in respect of: (i) the counterfactual (or but for) price-cost margin $(p_0 - c_0)$ that would have been secured by the

implausible that the retailer would then raise the price of a computer that otherwise would sell for \$999 to \$1003."

relevant purchaser absent the infringement; (ii) the observed quantity sold, q_1 ; and (iii) the counterfactual quantity sold, q_0 .

268. It is important to note that the observed price-cost margin ($p_1 - c_1$) is not the relevant margin required to compute the volume effect. This is because unless the pass-on rate is 100%, which means that the firm passed on every euro of the relevant overcharge, the counterfactual margin would have been different. If, for instance, the purchaser passed on only 50% of the cost increase, logically this reduces its margin, which means that the observed margin will be smaller than the counterfactual measure. In this case, using the observed margin would thus understate the size of the volume effect.
269. Note that the estimation of the counterfactual margin may provide information about the pass-on rate, or conversely, the pass-on rate may indicate the size of the counterfactual margin. This relationship is discussed above in paragraphs 224 and following.
270. Using the relevant data from the claimant, the expert can use comparator-based techniques to estimate the counterfactual margin or the counterfactual quantity. For example, with data on the purchaser's margin, the expert can perform a before/during/after analysis to obtain **an estimate of the counterfactual unit margin**. This analysis may be as simple as comparing the purchaser's margin during and outside the infringement period.
271. Naturally, because the customer's profit margin may be affected by other factors that are unrelated to the infringement, it might be important to control for their confounding influence by using regression analysis.¹⁵⁹ Failing to do so could lead to the counterfactual margin being either over- or under-stated.
272. To estimate the counterfactual level of quantity sold on the downstream market, the expert may consider using the volume sold outside the infringement period as a measure of the counterfactual quantity. However, quantity sold may fluctuate for other reasons than the infringement, and omitting consideration of confounding factors may bias the estimate. To control for the potential influence of these factors, the expert may develop a regression analysis.

IV.A.4.2. Elasticity approach

273. Alternatively, a measure of the volume loss associated with pass-on can be calculated by combining an estimate of the relevant downstream price

¹⁵⁹ See the EC Practical Guide at paragraphs 69-90.

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increase(s), e.g. as calculated by the expert in quantifying the passing-on effect, with an estimate of the sensitivity of relevant demand to such price changes.¹⁶⁰

274. In general, the volume change suffered by a firm will be sensitive to changes in its own price(s), as well as in rivals' prices. Hence, the magnitude of the volume loss will generally depend on – and, therefore, require an assessment of – how an overcharge (or the upstream pass-on of such an overcharge) has affected the prices of all competitors on the market, as well as on the sensitivity of the relevant demand to those price changes. Thus:

$$\begin{aligned} \text{Volume loss} &= \text{own price increase} \times \text{sensitivity of demand to own price change} \\ &+ \\ &\text{competitor price changes} \times \text{sensitivity of demand to competitor price changes} \end{aligned}$$

275. The volume effect – the profit loss implied by this volume loss – is calculated by multiplying the estimated absolute volume loss with the counterfactual margin discussed in the previous sub-section.

276. In situations where competitors are broadly similar, facing the same market conditions, and are equally affected by an overcharge (i.e. it is **an industry-wide overcharge**), the impact on their prices can be expected to be broadly symmetric too. In such a case, any resulting loss of sales will tend to be to products outside the market and not to other firms within the market. For example, suppose that all milling companies increase their flour prices by a similar amount (e.g. in response to an illegal overcharge of the price of grain). Whilst consumption of flour may be reduced as a result, with some customers turning to substitute products, the milling companies will tend not to lose sales to one another, since they have all increased prices similarly. In this environment, a measure of the price elasticity of aggregate or market demand can provide an appropriate measure of the proportionate reduction in an individual firm's volume of demand in response to a market-wide increase in prices.¹⁶¹ In this case, the volume effects of both the own price and competitor price changes are captured by the aggregate price elasticity.

277. In these circumstances, the volume effect can be expressed as follows:

$$\text{Volume effect} = (p_0 - c_0) \times \text{Price increase} \times \varepsilon_M \times q_1/p_1$$

¹⁶⁰ In general, information on competitor price increases will also be required.

¹⁶¹ This is the elasticity of overall market demand to a market-wide change in prices, which gives a measure of changes in total volume demanded in response to a 1% change in the market price.

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where $(p_0 - c_0)$ is the counterfactual margin, ε_M is the aggregate or market elasticity of demand, and p_1 and q_1 are the observed price and quantity sold for the firm in question respectively.

278. The (absolute value of) the price elasticity of demand refers to the degree to which demand for a product will fall as a result of a 1% increase in the relevant price, holding all other prices constant. Suppose, for example, that the market elasticity of demand is 2. This means that if market prices increase by 1%, holding prices of products outside the market constant, market demand will fall by 2%; if market prices are increased by 5%, then demand will decline by 10%. Note that in a symmetric market subject to industry-wide overcharge, individual firm demand is predicted to fall by 10% too in this case.
279. The key challenges faced by an expert adopting the elasticity approach are: (i) to estimate **the counterfactual margin** $(p_0 - c_0)$, as in the direct approach, and (ii) to estimate the **relevant elasticity of demand**.¹⁶²
280. The other inputs required to estimate the volume effect either come from the estimation of the passing-on effect (in the case of the price increase) or should be readily available (in the case of the observed quantity sold, q_1 , and the price, p_1 , actually charged by the purchaser).
281. *Cheminova* (2015) is a case that offers insight with respect to the estimation of volume effects using market elasticity information. Indeed, to the best of our knowledge, it is, to date, the only judgment from an EU Member State court in which the volume effect has been estimated. The judicially-appointed expert in the case used a variation of the elasticity approach (see **Box 25** below).

¹⁶² See also Practical Guide at paragraph 130.

Box 25: Cheminova (2015) – volume effect

Maritime and Commercial Court, Case no. U-4-07, *Cheminova A/S v. Akzo Nobel Functional Chemicals BV and Akzo Nobel Base Chemicals AB*, judgment of 15 January 2015.

It is to be recalled that the judicially-appointed expert concluded that Cheminova had passed on 50% of the overcharges (see **Box 23** above). The expert went on to find that the company had suffered a consequential decrease in its sales volumes amounting to 20% of the overcharge amount; i.e. Cheminova had suffered harm in the form of the volume effect.

The expert decided to adopt a “pragmatic solution” proposed by the European Commission in its EC Practical Guide using data provided by the parties. This methodology estimated volume effects as the counterfactual margin multiplied by the number of sales not made due to pass-on. The expert calculated the number of units not sold, using demand elasticity. The expert derived a measure of elasticity by averaging the demand elasticities found by 23 market demand studies for pesticides. It did so because the expert lacked specific data on the demand elasticity of dimethoate which had been conducted between 1987 and 2003. This resulted in an average demand elasticity of 0.66. The expert estimated the counterfactual margin by adjusting the realised margin during the cartel period. That is, costs were adjusted downwards by the amount of the overcharge while price was also reduced taking into account the fact that only half of the overcharge was passed on. The expert then estimated the loss of sales by multiplying the counterfactual margin with the estimation of sales not made, which resulted in damages equal to 20% of the overcharge amount.

282. Affected purchasers can also be expected to have an incentive to raise prices (or contract output) in response to **firm-specific overcharges**. Moreover, because this is likely to result in competitors gaining sales and/or securing higher prices, even unaffected competitors are likely to adjust their behaviour. In turn, these competitors’ response (even of competitors that are not directly affected by the overcharge) may, therefore, affect the extent of the volume loss suffered by the affected purchaser(s).
283. In assessing the volume effect suffered by a particular firm, it will accordingly be appropriate to consider: (1) how the affected firm’s own prices have been affected by the overcharge, (2) how competitors have adjusted their prices as a result, and (3) how all these changes have impacted demand for the claimant’s products.
284. A measure of the ‘own price’ volume effect can be calculated by using the (absolute value of) the own price elasticity of demand, which gives the degree to which a firm’s demand falls as a result of a 1% increase in its price, holding the price of competitors’ constant. The ‘own price’ volume effect is given by the following formula:

$$\text{'Own price' volume effect} = (p_0 - c_0) \times \text{Price increase} \times \varepsilon_0 \times q_1/p_1$$

where ε_0 is the own-price elasticity of demand.

285. An illustration of using the Elasticity Approach to calculate the volume effect is set out in **Box 26** below.

Box 26: Elasticity approach illustration

The expert finds among disclosed internal documents several reports of how a reduction in the firm's price level has caused sales to expand. Using the information on these events, the expert infers that the own price elasticity of demand faced by the direct purchaser is 2 ($\varepsilon = 2$).¹⁶³ 10,000 units of the product were in fact sold (i.e. $q_1 = 10,000$) and the actual price level was €200 (i.e. $p_1 = 200$). In addition, the counterfactual margin is estimated at €150; ($p_0 - c_0$) = 150. The expert finds that 20% of the initial price overcharge was passed on, and the upstream overcharge from the cartel is €20. This means that the price increase is €4. Applying directly the formula above, the approximate volume effect is then equal to €60,000 ($€150 \times €4 \times 2 \times 10,000 / €200$).

It is assumed that the direct purchaser's competitors have not been impacted by the overcharge, and that they tend also to raise their prices in response to upward price adjustment by the direct purchaser. In this case, the actual volume effect will thus be smaller than that predicted by the above calculation, which only provides an upper bound.

286. The above formula, however, does not take into account the impact of competitors' response (the own price elasticity of demand measures only the proportionate change in the volume of a product demanded following a change in its own price, assuming that other prices are held constant). This formula will provide only an approximation for the actual volume effect, therefore, since this volume reduction will also depend on how rivals change their behaviour. Importantly, the impact of changes in rivals' prices on demand for the affected firm's product will depend on the relevant cross-price elasticities of demand, i.e. how sensitive is demand for the product of interest to changes in the prices of other products. The extent of these effects will depend on whether products are close substitutes or not. Thus, if rivals offer products that are distant substitute, it may be inferred that competitor responses are unlikely to affect the volume effect significantly, even if it is not possible to measure these effects accurately.
287. It is important to realise that the elasticity of demand for any individual firm and the elasticity of aggregate demand on a market can be very different. Accordingly, it is important to employ the most appropriate measure.¹⁶⁴ In the milling industry illustration, for example, the demand faced by an individual milling company may well be very sensitive to pass-on of a firm-specific overcharge. This is because, once it raises price, a firm will lose sales to other milling companies who have not increased their prices. On the other hand, aggregate demand for flour will be less elastic, and perhaps even inelastic. This is because the market elasticity measures how aggregate demand changes

¹⁶³ It is conventional to refer to the absolute value of the own price elasticity of demand (i.e. to refer to a positive number) on the basis that it is understood that higher prices lead to lower demand. Here we report only the absolute value when referring to own price elasticity of demand.

¹⁶⁴ Note that elasticity can be measured also for individual products.

when all milling companies raise price by the same amount. As explained above, a measure of the market-wide elasticity of demand may provide a more appropriate elasticity measure when the overcharge is industry-wide; and, in this case, the effect of both the own-price and the competitors' price changes are taken into account.

IV.A.4.3. Counterfactual volume approach

288. This option is a variant of the elasticity approach presented above. It utilises the observation that, in theory, a firm's ability to raise price profitably depends on how price-sensitive is the demand for its product. Hence, an inverse relationship is predicted between a firm's price mark-up (margin) and the relevant own-price elasticity of demand. Drawing on this, the own-price elasticity and the counterfactual margin can be 'cancelled out' and, so, removed from the 'own-price' component of the volume effect. The formula for this component then simplifies accordingly, as follows:

$$\text{'Own price' volume effect} = \text{Price increase} \times q_0$$

289. As noted above when quantifying the passing-on effects, there are a number of ways to estimate the downstream price increase that results from pass-on (using either the direct approach or the pass-on rate approach).
290. Since this price increase is also required to quantify the passing-on effect, the only additional input required is a reliable measure of the counterfactual volume, q_0 . This approach therefore offers a somewhat more economical means of arriving at the 'own price' volume effect than the direct or the elasticity approaches as it does not require estimating the counterfactual mark-up or the relevant elasticity. An illustration of how the calculation is performed is set out in **Box 27**.

Box 27: Illustration of counterfactual volume calculation

The expert knows that the relevant pass-on rate is 40%, and the unit overcharge is €20. If the expert estimates that the counterfactual quantity sold would have been 11,000, then the output effect is €20 x 40% x 11,000 = €88,000.

291. At the same time, this simplification does not address the component of the volume effect potentially caused by changes in competitors' prices.

IV.A.5. The discount approach

292. As indicated in [Section I.B](#) the overcharge, passing-on, and volume effects are inherently linked. The passing-on effect and the volume effect are two sides to the same price-setting process. In deciding by how much to increase

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prices in response to an increase in its costs, the firm in question will in principle take into account the sales which will be lost as a result. (This is the same in all pricing decisions – the incentive to keep increasing prices is eventually always curtailed by the adverse impact of profit lost on lost sales.) The pass-on rate reflects the outcome of that process. It links the passing-on effect to the overcharge.

293. In a largely theoretical exposition of cartel damages and the passing-on defence, Verboven and van Dijk (2009) set out expressions for the combined impact of the overcharge, passing-on, and lost volume effect. Specifically, that combined effect is expressed in terms of a discount on the overcharge effect.¹⁶⁵
294. In order to calculate such a discount rate when the overcharge is industry-wide, the expert requires information on relevant pass-on rates, amongst other parameters. The pass-on rate is, therefore, identified as an input into this calculation. Nevertheless, economic theory indicates that the pass-on rate will itself depend on a range of market and cost parameters, as discussed above.
295. In addition, the discount rate also depends on relevant measures for the elasticity of demand. Economic theory also indicates that the elasticity of a firm's demand is central to determining the optimal trade-off between price and output which underpins a profit-maximising firm's pricing decisions, and the resulting mark-up of price over cost. (It is to be recalled that the elasticity gives the percentage reduction in output that will result from a given percentage change in price.) This theoretical insight can be used to replace a requirement for information on the elasticity of demand with information on alternative parameters, such as the aggregate diversion ratio, D , and, even more straightforwardly, the number of firms, which may be more readily observable. Again, however, these transformations typically rely on insight into the precise nature of competitive interaction or a willingness to accept assumptions in this regard.
296. In practice, this approach can be applied without estimating a pass-on rate or any elasticities by making some additional, but strong assumptions. For example, in a differentiated products industry, under some assumptions, **the discount factor can be computed using only market shares**, which makes it relatively easy to implement if this information is available.
297. More precisely, on the basis of the following assumptions:

¹⁶⁵ See [Section D.1.8](#) in [Annex D](#) for further elaboration.

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- Firms are engaged in Bertrand competition,
- All competitors are symmetric, which implies all firms have the same size, they are equally close competitors, and pre-infringement they set the same equilibrium price, and
- Customer demand is approximated by a logit model, implying that substitution patterns are proportional to market shares.

298. Verboven and van Dijk show that the discount can be expressed in terms of the market shares of the purchaser and its competitors, as well as the share of the so-called “outside good”. In addition, information about the identity of competitors that are affected by the infringement will be required.

299. Verboven and van Dijk illustrate their approach using public information on the Vitamin Cartel to approximate the discount that would apply in the case of premixers, who buy vitamins from producers and then combine vitamins with other nutrients to form a package in powder or liquid form for use in the production of animal feed (in the event they claim damages against vitamin producers).¹⁶⁶ Because pre-mixers were potentially capable of passing on part of the overcharge to their own customers (compound feed producers) and as result lose sales, this approach may provide an indication about how much the overcharge should be discounted to account for these effects.

300. Using market share data for the premixers from a UK Competition Commission report and assuming the share of the outside option to be zero (as there are apparently few alternatives to premixers), Verboven and van Dijk calculate the discount to be around 90% if all premixers are impacted. The value of the estimated discount falls as they assume that an increasing proportion of premixers had not been affected by the cartel.

301. The advantage of this approach is that it is not data intensive - it only requires information on market shares-and it can be relatively quickly implemented.¹⁶⁷ However, this relatively easy approach comes at the expense of making strong simplifying assumptions. For instance, there is no guarantee that symmetry applies or that consumer behaviour can be approximated by a logit model. It is not clear, however, what impact these assumptions have on the results, making it difficult to assess the reliability of this approach.

¹⁶⁶ On 21 November 2001, the European Commission issued a prohibition against eight producers of vitamins for participating in market-sharing and price-fixing cartels.

¹⁶⁷ Nevertheless, note that in *Cheminova* (2015) the judicially-appointed expert did not consider he had sufficient data to apply this approach (see **Box 25** above).

302. In general, it would appear prudent to deploy this simplified version of the discount approach only as **an initial check to gauge the credibility of the passing-on defence**, in particular early on in the process. Once information about firms' pricing policy become available, the results may then have to be adjusted.

IV.A.6. The simulation approach

303. The EC Practical Guide identifies the simulation approach as offering another way of quantifying the effect of the infringement, notably on prices paid by direct purchasers the infringers' price increase.¹⁶⁸ This approach, which, like the discount approach, accounts simultaneously for the passing-on and the volume effect, can also be used to compute the economic loss suffered by claimants further downstream who are not end customers. To this end, the expert would develop a model of competition at the stage of the supply chain in which the claimant is active, and simulate the impact of the relevant overcharge on the claimant's profit. (Operationally, the expert will compare the claimant's profit under the infringement scenario (the claimant's cost is increased on the basis of the overcharge) with that in the non-infringement scenario.)
304. With this approach, the expert relies on formal economic models of competition, some of which are described in Section III. These models consist of a set of equations that approximate the competitive interaction between downstream firms as well as consumer behaviour. On the supply-side, the expert will typically adopt either a Bertrand or a Cournot model of competition.¹⁶⁹ The expert will also make some assumptions about the shape of the cost function. On the demand side, the expert will specify a demand equation which approximates consumer behaviour. This expression will serve to predict the extent to which consumers react to price increase. However, as indicated above, in oligopoly settings the shape of the demand function also affects the pass-on rate. In this context, the expert must have regard to whether the results of his or her analysis depend on the particular shape of the demand curve that is assumed.
305. The combination of the supply and demand-side will yield equilibrium prices. Importantly, the expert must obtain the value of the model's parameters to predict the equilibrium price level, which will then be used to predict changes in profit. In a first step, the expert sets the value of the model's parameters in the non-infringement situation. Subject to the availability of relevant data, one method consists of estimating econometrically the value of these

¹⁶⁸ See EC Practical Guide at paragraphs 97-105.

¹⁶⁹ See Section III.A.

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parameters. For example, the expert may estimate a demand model, which measures how consumers react to price changes. Combined with the supply-side, the demand parameter estimates can also be used to predict equilibrium prices. Alternatively, the expert may calibrate the parameter values of the model based on a particular set of measures such as observed profit margins (or elasticities estimated from other sources) and/or market shares in the non-infringement period.

306. Once the value of the model's parameters are obtained, in a second step the expert can then simulate the impact of the overcharge that affects marginal cost, on the equilibrium price.¹⁷⁰ Specifically, it is possible to simulate by how much the relevant purchaser raises prices as a result of this specific cost increase, and by how much its output contracted, while also accounting for the fact that its competitors may or may not have been impacted by the infringement (i.e. the expert can simulate the effect of industry-wide or firm-specific overcharge).
307. We briefly summarise the work published by Kim and Cotterill (2008) in **Box 28** below to illustrate how such an approach might work in practice. The authors focus on the effect of a marginal cost increase in the supply of US processed cheese, and in particular they quantify by how much prices would rise as a result. Their results could be interpreted as simulating the impact of an infringement that affects the marginal cost of US cheese suppliers.

Box 28: Kim and Cotterill (2008)

In their study, Kim and Cotterill make the following assumptions. On the supply-side they assume that branded processed cheese are sold by firms who compete "à la Bertrand" and whose marginal cost is constant – i.e. the marginal cost is the same irrespective of how much output is supplied. Because suppliers of branded processed cheese offer differentiated products, the authors consider a demand system in which each product has its own-price elasticities and cross-price elasticities with rival products. They estimate the parameters of the demand system using data on price and quantity sold of processed cheese in supermarkets in the most populous metropolitan areas in the US. (Scanner data records consumer transactions.) Using the parameter estimates for each brand of cheese they derive the product marginal cost and then compute the equilibrium price. They then simulate the impact of an increase in marginal cost on the price of processed cheese. They found that, under the assumption that suppliers of processed cheese compete à la Bertrand, the pass-on rate ranges from 73% to 103%. Alternatively, if instead they assume that suppliers collude, then the simulated pass-on rate is substantially lower, ranging from 21 to 31%.

308. Using this approach thereby allows the expert to quantify the price increase and the output reduction that result from a specific marginal cost increase,

¹⁷⁰ In these formal models of competition, only marginal cost affects pricing. Therefore if the overcharge raises fixed costs, because these models will predict no pass-on, they may not be appropriate to determine whether pass-on actually occurred. In this context, experts may consider alternative approaches to assess empirically the extent to which changes in fixed cost impact on the relevant purchaser's price.

whether the increase is industry-wide, restricted to a group of competitor or just firm-specific. Multiplying the downstream price increase with actual volume sold, the expert can easily compute the passing-on effect. Similarly the expert calculates the volume effect using the simulated output reduction and the margin predicted by the model.

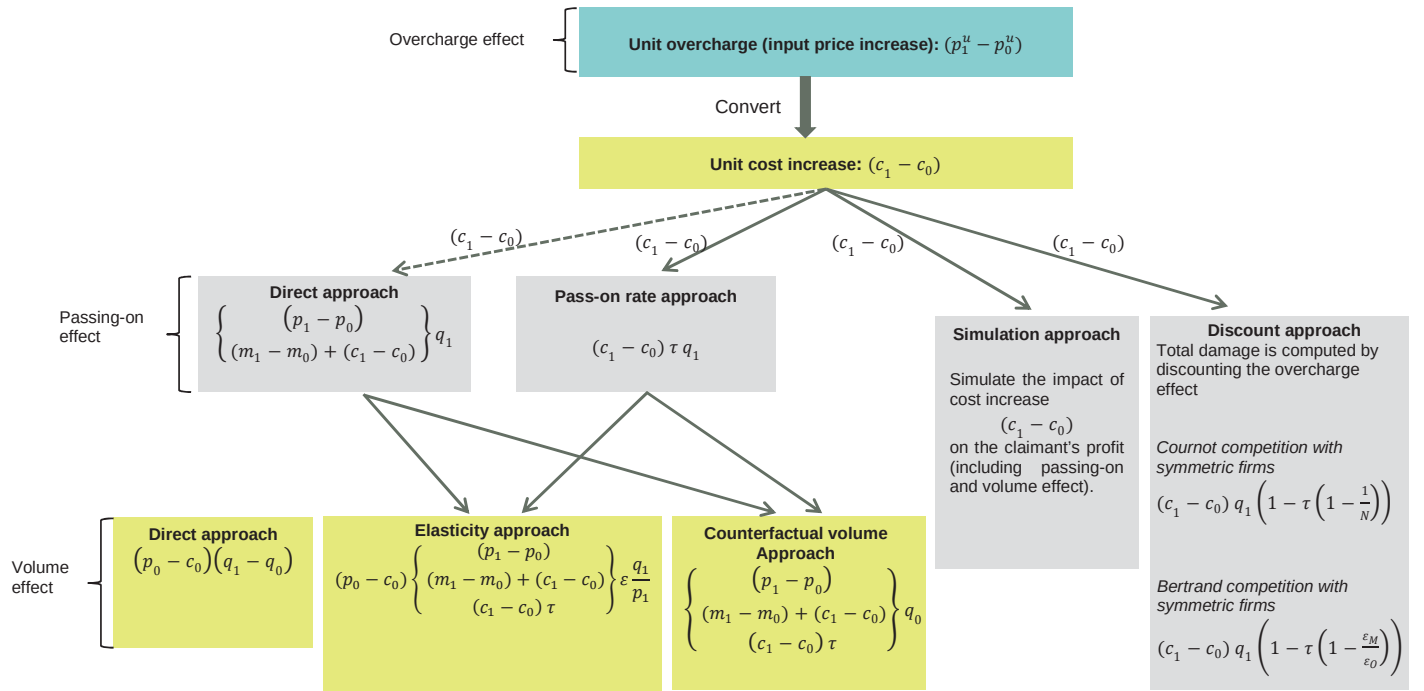
309. The advantage of the simulation approach is that it accounts for the competitive interaction between the purchaser and its rivals, and easily accommodates scenarios where the overcharge is firm-specific, industry-wide or any situation in between. The downside of this approach, however, is that it requires the expert to make a number of strong assumptions about firms' and consumers' behaviour, which might be difficult to validate.

IV.A.7. Summary and ranking of approaches

IV.A.7.1 Road Map

- 310.
311. **Figure 11** below sets out a schematic summary (road map) of the various quantitative approaches that have been presented above to measure the pass-on and the volume effects.

Figure 11: Road Map



Notes on the variables:

$p_1/c_1/q_1$: represent the purchaser's observed price/cost/quantity during the infringement; p_1^u represents the price of the input at issue;

$p_0/c_0/q_0$: represent the counterfactual price/cost/quantity; p_0^u represents the counterfactual price of the input at issue;

τ : the pass-on rate (if marginal cost increases by €1, the price is increased by τ);

ε_O : the own-price elasticity of demand (if a firm increases its price by 1%, its demand will decrease by $\varepsilon_O\%$);

ε_M : the market-price elasticity of demand (if all the firms in the market increase their price by 1%, demand will decrease by $\varepsilon_M\%$);

N : the number of firms in the market.

312. The road map underscores the main challenges in estimating some of the key inputs for quantification. All the price (p_1), cost (c_1) and quantities (q_1) with the subscript 1 are observed value, for which data should be available. The corresponding values with the subscript 0, represent the counterfactual value. Naturally, there is no readily available data for these since they would have been only realised had the infringement not taken place. Finally, the parameters represented by the Greek letters τ , ε and η , represent respectively the pass-on rate, the own-price elasticity and the market price elasticity, and these have to be estimated using data or derived from documents.
313. In general, the expert will first produce an estimate of the overcharge for the input that is the object of the infringement, $(p_1^u - p_0^u)$. This overcharge can then be converted into a unit cost increase for the claimant, $(c_1 - c_0)$. For example, if the purchaser uses 3 units of input to produce 1 unit of output, it suffices to multiply $(p_1^u - p_0^u)$ by 3 to obtain the change in unit cost $(c_1 - c_0)$. The cost increase can then be used as an input to compute the other components of damages, the passing-on and the volume effects, or compute these components simultaneously as in the discount approach or the simulation approach. (The arrows in the figure below indicate that some inputs used in the box can also be used in the other box to which the arrow points).
314. If the expert opts for a sequential approach to quantification, some of the inputs, which must be either derived from qualitative evidence or estimated with data, can be used to compute both the passing-on effect and the volume effect. For example, when calculating the passing-on effect using the Direct Approach, the expert estimates the downstream price increase that results from the infringement, either with a direct measure of the price increase, $(p_1 - p_0)$, or by combining the change in profit margin and cost as follows, $(m_1 - m_0) + (c_1 - c_0)$. This price increase can then be used to compute the volume effect using the elasticity approach or the counterfactual approach.

IV.A.7.2. Ranking of approaches

315. In order to discharge their burden of proof, parties to litigation will normally have to present an estimate of damages suffered and/or the extent of passing-on, even where the level of information available is limited.¹⁷¹ The

¹⁷¹ The availability of evidence (and difficulty of proving certain facts) may be a factor for courts to bear in mind, nonetheless, in assessing the discharge of the burden as a matter of national law (see also, Article 17(1) of the Directive in relation to quantification of harm). Presumptions also have a role to play (such as the presumption of pass-on for indirect purchaser claims contained in Article 14(2) of the Directive). See further [Section V.A.2.](#)

expert may use one of the approaches presented in this section (and summarised in the road map) to account for the passing-on and volume effects. Depending on data availability, the expert may have in some cases to rely only on internal documents or other qualitative evidence to derive some of the key parameters that are necessary to compute the loss of profit caused by the infringement. Naturally, the quality of the information that is used will affect the reliability of the estimation.

316. Even though, in theory, all of the approaches described above could provide a reasonable approximation of the economic loss suffered by a particular claimant, in practice this might not always be the case and, depending on the circumstances, one approach or combination of approaches may be preferred to another. We discuss a possible ranking of approaches below, emphasising in particular those that are more likely to yield robust results. This can only be by way or orientation, however, since the question of what is the best approach will inevitably be dependent on the particular legal, factual and evidentiary circumstances of any specific case and is a matter for adjudication by the national court.

317. In broad terms, the reliability of an approach depends on:

- The quality of the information that is used, and
- The nature of the assumptions.

318. Furthermore, the choice of approaches will depend on data/information availability. **Table 2** below summarises briefly the minimum data requirements for each. It should be noted that some versions of different approaches offer lighter (less data-intensive) versions. For example, to estimate the passing-on effect using the pass-on rate approach, the expert adopts the reference approach and relies on qualitative information such as external industry studies. This version, however, is likely to be less accurate than if the expert had enough data to undertake a thorough econometric analysis.

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Table 2: Data requirements

Approach	Minimum data/information requirements
Pass-on effect: direct approach	Data on the claimant price and on the benchmark price. Data on the claimant realised volume sold.
Pass-on effect: pass-on rate approach	Data on the input price or on the claimant cost as well as data on the claimant price. Otherwise information on pass-on rate. Data on the claimant realised volume sold and information on the overcharge.
Volume effect: direct approach	Data on the claimant realised volume sold and on a corresponding benchmark. Data on benchmark mark-up.
Volume effect: elasticity approach ¹⁷²	Either rich set of data to estimate elasticity econometrically or access information on elasticity estimate. Data on benchmark mark-up and on realised price and volume sold. Price increase can be used from the passing-on effect.
Volume effect: counterfactual volume approach ¹⁷³	Data on counterfactual volume sold. Price increase can be used from the passing-on effect.
Discount approach	Data on pass-on rate. For symmetric Cournot, number of firms. For symmetric Bertrand, data to estimate demand model or information on elasticities. For symmetric Bertrand with logit, data on market shares for affected and unaffected players.
Simulation approach	The parameters of the model can be calibrated on market shares and margins (or available elasticities). Or the (demand) parameters can be estimated econometrically, requiring a rich set of data.

319. To facilitate the discussion we can group the approaches into two separate categories: the **sequential approaches**, which consist of estimating separately the components that form the quantum of damages, and the **holistic approaches**, which calculate total damages in an integrated way, accounting simultaneously for the passing-on and the volume effect. To take an example: using a direct approach for the passing-on effect and an elasticity approach for the volume effects entails sequential approaches. Conversely, the discount approach involves quantification of the combined effects of passing-on and volume simultaneously and is thus a holistic approach.¹⁷⁴

¹⁷² As indicated in [Section IV.A.4.2](#), the elasticity measure does not take into account competitors' response.

¹⁷³ As indicated in [Section IV.A.4.3](#), this approach also does not account for competitors' response.

¹⁷⁴ Note, in addition, that when carried out by an indirect purchaser, the direct estimation of passing-on by the direct purchaser (prices paid by the indirect purchaser) calculates the indirect overcharge paid by the indirect purchaser (which is the result of two combined effects: (i) the overcharge to the direct purchaser, and (ii) the passing-on of that overcharge downstream to the indirect purchaser).

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320. The direct approaches, which are based on comparator-based techniques (whether estimating the passing-on effect or the volume effect),¹⁷⁵ have the following advantages:

- They do not rely on any particular assumption about the nature of competition or about consumer behaviour;
- They apply directly to the case at hand; and
- (For indirect purchaser claimants in the context of upstream pass-on) they can be carried out using data principally in the hands of the indirect purchaser.

321. The accuracy of these approaches hinges on successfully implementing comparator-based techniques. To this end, the main challenges are:

- the availability of a suitable benchmark that must be unaffected by the infringement, and
- access to sufficient data to undertake a robust analysis that control for the potential influence of confounding factors.

322. Other approaches may also yield solid results, but they rest on estimating with enough precision the value of parameters, such as the pass-on rate and the elasticity of demand. For instance, to calculate the pass-on effect, the expert may adopt the pass-on rate approach, which critically depends on obtaining an estimate for this parameter. As described in [Section IV.A.3.2](#) above, there are different ways of obtaining such a measure. We would recommend, where possible, focussing attention on the empirical approach and the firm's pricing policy approach (noting that, even if data is available, when implementing an empirical approach the expert should always consider any relevant information about firm pricing policy, and conversely, the expert should consider whether the stated pricing policy is adhered to in practice). If sufficient data is available, the expert will be able to estimate directly the impact of the overcharge on the claimant's price, or alternatively use data on other costs to estimate a proxy measure of pass-on. In cases where such data is not available, the expert may have to rely heavily on information about the firm's pricing policy (for example from contracts, internal documents or witness statements) to establish pass-on, together with other reference information and insights from economic theory. The challenge is that it may be quite difficult to arrive at a precise estimate of pass-on in this way.

¹⁷⁵ Described in [Sections IV.A.3.1](#) and [IV.A.4.1](#) respectively.

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323. These approaches may not be feasible, at least in the early stage of the proceedings. This is because there is neither the required data to estimate the pass-on rate nor sufficient documentary evidence to establish with precision the relevant firm's pricing policy. When information about the case is scant, the expert may rely exclusively either on the reference approach or on predictions based on economic theory. These approaches may at a minimum provide an initial view on the plausibility of pass-on. Through the process of disclosure, however, the parties may be able to gather important missing information to refine their initial estimates. Nevertheless, in cases where it is not possible to muster more information or data, these approaches, even though they are far from ideal, may be used to provide a range of possible estimates for courts to consider. Experts should anyway be mindful that, in a court setting and consistent with the practice of assessing evidence as a whole, any economic assessment, including empirical methods, will be verified against other evidence and facts; accordingly, all approaches (including the reference and theory-based approaches) are potentially relevant and may need to be considered.¹⁷⁶
324. To estimate the volume effect experts may use different approaches. As indicated above, the Elasticity Approach or the Counterfactual Volume Approach may not be as accurate as the Direct Approach. This is because they do not account for competitors' reaction, whilst such responses also affect how much firms sell on the market. Furthermore, when selecting the Elasticity Approach, experts will have to obtain information on the relevant elasticity parameters. One possible way to arrive at an estimate for these parameters is to develop a demand model that can be estimated econometrically. However, this option is demanding in terms of data requirements and assumptions. Alternatively, the expert may obtain elasticity measures for the product in question from other sources (consumer surveys, studies etc.), but these may not be appropriate to the case at hand, and in this situation, the accuracy of the estimate will be placed in some measure of doubt. Overall, therefore, unless sufficient data is available and time allows for estimation of the relevant elasticities econometrically, the elasticity approach might not provide an accurate estimate of the volume effect.
325. The holistic approaches, namely the discount and the simulation approaches will also rely on parameters that are either estimated econometrically or derived. In addition, in both cases, the expert will have to make some strong assumptions about the nature of competition, and notably decide which one of the standard models of oligopolistic competition applies. Furthermore, the

¹⁷⁶ See [Section V.B](#) below for guidance relating to assessment of economic and other evidence by courts.

expert will have to make some assumptions about consumer demand, and in general will assume a particular functional form for the demand equation. As explained in [Section III.B.5](#), the curvature of demand plays a critical role in determining pass-on. If the expert assumes that demand is linear or isoelastic, for example, then this choice will have an important bearing on the outcome of the analysis, as linear demand is associated with a lower pass-on rate than isoelastic demand.

326. Furthermore, these approaches may be demanding in terms of data requirements. For example, the expert may estimate the parameters of a demand equation econometrically (as discussed in paragraph 324 above) to obtain a measure of the relevant elasticities, which can be used either to compute the discount under the discount approach or as parameters for the simulation model. When the expert does not have access to relevant data, notably on price, cost and sales, the expert may use a simplified version of these approaches to obtain a rough approximation of the damage. For example, when assuming that consumer demand is approximated by a simple logit model and that firms compete à la Bertrand, the discount approach can be undertaken using only market share information (see paragraphs 296-300 above).

IV.B. Main challenges of damage estimation

327. In this subsection, we discuss in more detail some of the key challenges to implementing the approaches presented in [Section IV.A](#) above. In particular, in order to estimate certain effects a relevant counterfactual may have to be identified. This may require that relevant parameters, such as the pass-on rate or the elasticity of demand, be estimated. In the rest of this subsection we discuss in turn:

- the pass-on rate;
- direct estimation of the pass-on effect;
- the counterfactual margin;
- the counterfactual volume level;
- the price elasticity of demand; and
- the relevance of the curvature of demand.

IV.B.1. The pass-on rate

328. A measure of the pass-on rate – i.e. the rate at which the unit overcharge is passed on to the downstream price – is a critical input for several of the approaches presented in [Section IV.A](#) above, whether to quantify the passing-on effect or the volume effect. As set out in the road map (**Figure 5** above) the pass-on rate can be used to calculate the gain in profit from passing on the overcharge using the pass-on rate approach or to quantify the volume effect using the elasticity approach (or potentially the price increase approach). In addition, the pass-on rate is also a critical input to the discount approach to overall damage quantification.

329. In this section, we focus on quantitative approaches that the expert may employ to estimate this particular parameter. However, the expert may have to consider qualitative alternatives too, particularly if suitable data is not available, as to which see the discussion at [Section IV.A.5.2](#) and [Section V](#) below.

IV.B.1.1. Which input cost data to consider?

330. The infringement at issue often concerns the price of an input which constitutes just one component of the purchaser's (marginal) cost. For example, a producer of carbonated soft drinks may have to pay more for the sugar contained in its drinks if sugar supply is affected by a cartel or abuse of a dominant position. However, the costs of sugar purchases will only represent a portion of the overall marginal cost of carbonated soft drink productions.

331. Depending on data availability and the significance of the input in question for the purchaser's costs, the expert may contemplate two different empirical strategies to quantify the extent of the relevant purchaser pass-on rate (which are illustrated in the sugar example in **Box 29** below):

- The expert may quantify directly the relationship between changes in (i) the price of the input in question; and (ii) the downstream market price that the purchaser charges for its product; or
- The expert may (i) estimate the relationship between changes in the purchaser's marginal cost and in its pricing behaviour, and (ii) seek to estimate the relationship between the purchaser's marginal cost and changes in the price of the affected input. Using (i) and (ii), the expert may then assess how the price increase of the affected input impacts on the purchaser's price.

Box 29: Marginal cost pass-on analysis illustration

As a result of a cartel infringement, the price of sugar was increased by 25%, from €10 to €12.5 per unit. In this case, the two strategies for assessing pass-on might work as follows:

- The expert estimates directly that manufacturers of carbonated soft drinks pass on only 15% of the increase in the price of sugar. This implies that the downstream price is increased by 0.375 cents (i.e. €2.5 euros x 15%) as a result of the sugar overcharge.
- Alternatively, the expert has evidence that manufacturers of soft drinks have a (constant) pass-on rate of 50%, and that 30% of a unit of sugar is used to produce each unit of carbonated soft drinks. On the (non-trivial) assumption that overcharges affecting sugar specifically will be passed on at the same rate, the combination of these separate pieces of information indicates that the price of carbonated soft drinks will have been increased by 0.375 cents (i.e. €2.5 x 50% x 30%) as a result of the sugar overcharge.

332. The choice of empirical strategy available to the expert will depend on data availability but also and importantly on the contribution that the cartelised input makes to the purchaser's marginal cost. If the cartelised input constitutes only a very small fraction of the marginal cost, then even a significant increase in the price of that input may hardly be detected in the purchaser's price data, even if it is passed on in full. In this case, a reliable measure of the pass-on rate may not be obtainable through "direct" estimation. We take the sugar example again in **Box 30** below to illustrate this point.

Box 30: Input cost relevance analysis illustration

If the price of sugar is raised by 25%, but sugar contributes less than 1% to affected food producers' marginal costs, then the downstream price would be increased by just 0.25%, if the overcharge were passed on in full. Such a small change in the downstream price might be difficult to disentangle from random price fluctuations, even if the expert tries to account for the influences of confounding factors. In this context, the expert may consider the second strategy, which will exploit more substantial variations in marginal costs, caused by changes in the costs of more significant inputs, and not just the cost of the affected input, in order to identify a measure of the pass-on rate.

333. Crucially, however, the validity of the second strategy, which does not rely on observing the effects of a price increase of the input in question but on other costs, is based on the assumption that the pass-on rate does not vary according to the source of the cost change. In other words, it supposes that marginal cost increases are passed on at an identical rate irrespective of the source of the cost change.

334. However, there are good reasons why firms may not always pass on small changes in their marginal costs (at least not immediately), even if they would pass on larger cost changes, and it may hence not be legitimate to assume that the extent of pass-on will be similar. For example, the firm may incur menu costs (i.e. costs that are incurred to alter prices irrespective of the size of the change) and thus prefer waiting until marginal cost increases

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accumulate beyond a certain threshold before altering prices, or it may not in fact have recognised that a relevant change in circumstances has occurred.¹⁷⁷

335. Because the second strategy may be employed when the input in question is not a significant contributor to the purchaser's marginal costs, questions regarding the passing-on of small changes in marginal cost becomes critical. Whilst the empirical analysis may deliver an estimate of a pass-on rate based on historical, large cost changes, a review of the firm's pricing policies may indicate that small changes may not be passed on or that passing-on of such changes is likely to be delayed. In other words, the assumption of uniform pass-on may not be justified. This issue is a relevant one in US litigation and may raise an important hurdle to certification of indirect purchaser class actions (see the examples from the *In re Optical Disk Drive* case in **Box 31** below).

Box 31: *In re Optical Disk Drive* (2014, 2016)

In re Optical Disk Drive Antitrust Litigation, 303 F.R.D. 311, 319 (N.D. Cal. 2014) ("*ODD I*") and *In re Optical Disk Drive Antitrust Litigation*, 2016 WL 467444, at *13 (N.D. Cal. Feb. 8, 2016) ("*ODD II*")

In *ODD I*, class certification was denied, in part, because indirect purchasers could not prove pass-on; the court's concern was that pass-on might vary greatly by sales channel. As to pass-on of small costs, the court found that "*the indirect purchasers have not presented a persuasive explanation as to why it would be reasonable to assume a uniform pass-through rate given that ODDs [Optical Disk Drives – the cartelized product] typically make up a relatively small portion of the cost of the products into which they are incorporated, and given the existence of price points—i.e., the common practice in the industry of selling products costing in the hundreds of dollars at prices just under the next \$100 mark. Thus, for example, if the overcharge paid by the direct purchaser on an ODD installed in a computer was only four dollars, it seems implausible that the retailer would then raise the price of a computer that otherwise would sell for \$999 to \$1003.*"

In *ODD II*, class certification was granted after plaintiffs collected additional data and conducted additional analyses: the expert argued that "*pass-through rates ... [we]re uniformly high*" and the effect of small cost changes does not necessarily have to be seen in the price because "*manufacturers will adjust the 'quality' of particular computer systems, rather than the price.*" Indirect purchasers also tested prices at 99 dollar price points (e.g., \$299, \$399, \$499) and estimated separate regressions for several large OEMs (namely Dell and HP), recognizing the fact that rates may differ by entity. This was enough for the judge to send the case to the jury. "*Nevertheless, to the extent 'price points' are a significant factor in how computers containing ODDs are sold, they still potentially present issues for which the IPPs will ultimately have to account.*"

336. Hence, although the strategy based on estimating a pass-on rate using changes in marginal cost generally may provide a convenient solution in situations in which the cartelised input represents a small proportion of total

¹⁷⁷ See [Section III.A.1.](#)

marginal cost, it may lead the expert to overstate the extent of the passing-on effect. Careful consideration of whether such an approach is supported by other (qualitative) evidence is, therefore, warranted.

337. Furthermore, it should be noted that in situations where affected input costs are too small to be analysed on their own and can only be examined as part of a larger cost categories in which they belong, issues concerning the adequate evidencing of causation as a matter of law and, in particular, the use of factual presumptions to infer causal relationships, may arise.¹⁷⁸
338. The difficulties of isolating effects of small changes in marginal costs have been witnessed in some competition litigation in the EU.¹⁷⁹ The most recent is the *Sainsbury's MIF Litigation* referred to above. The issue was also important in the decision adopted by the Paris Court of Appeal in *DOUX Aliments* (2014). In this case, the small percentage impact of lysine on the marginal cost of poultry production was one of the factors, together with other elements of the particular market dynamics (supply of poultry products to supermarkets), that led the court to conclude that there had been no pass-on, as explained further in **Box 32**.

Box 32: DOUX Aliments (2014)

Appeals Court of Paris, Case No. 10/18285, *DOUX v. Ajinomoto & CEVA*, judgment of 27 February 2014.

Doux entered into poultry farming contracts which stipulated that Doux should supply animal feed containing lysine to the farmers for free. Doux sold the poultry to large retailers in France; Doux was, in fact, the largest French poultry supplier. Doux brought a follow-on damages action against Ajinomoto for the overcharges suffered between 1990 and 1995 as a result of its participation in the lysine cartel sanctioned by the European Commission. Doux also sued Ceva, Ajinomoto's distributor, and demanded information in relation to its pricing. Ceva produced information dating back to 1995 but the information was not used in Doux's expert report.

The *Tribunal de Commerce* of Paris dismissed Doux's claim on causality grounds. Because the market was deemed highly competitive and the overcharge was industry-wide, the Court found that Doux did not suffer damages because it could have passed on the overcharges. The Appeals Court of Paris reversed and awarded damages to Doux on the basis that determining whether pass-on had occurred was irrelevant to the amount of compensation to be awarded. The *Cour*

¹⁷⁸ See [Section IV.A.3](#).

¹⁷⁹ It is also worth noting that, in some cases, changes in prices caused by an overcharge may not be followed by higher input costs for direct purchasers but rather a lower input cost which should in fact have been even lower absent the infringement (which thereby succeeded in avoiding higher price falls than would have arisen with normal competition); examples include the Spanish Sugar Cartel and the EU LCD Cartel (*COMP/39.309 LCD (Liquid Crystal Displays)*). While not critical from an economic perspective, this may accentuate the legal difficulty of demonstrating that relatively small cost overcharges have in fact inflated the price at which the business set its products and, if so, to what extent (see, for instance, First Instance Court of Valladolid, Case No. 248/2009, *Galletas Gullón & ors v. Acor*, judgment of 20 February 2009). Nevertheless, economic methods presented in this [Section IV](#) seek to address some of these difficulties.

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de Cassation, however, disagreed and remitted the case back to the Appeals Court of Paris to determine whether Doux had passed on the overcharges.

The Appeals Court finally ruled, on the facts, that Doux had adequately proved the absence of pass-on.¹⁸⁰ The Appeals Court held that Doux had demonstrated that:

- i) Pass-on was not the normal commercial practice in the market because chicken prices respond to a multitude of economic factors.
- ii) Chickens are sold in an international and competitive market where prices respond not only to costs but also to demand and competition and prices are set by reference to the market aimed at ensuring the sale of product and the maintenance of some margin.

A 2008 market study showed that supermarkets accounted for more than 80% of the domestic purchases of poultry and that this acted as an effective block to price increases. The report thus evidenced Doux's dependence on supermarkets and its low profit margins. The Court found that lysine represents only 1% of the costs of chicken production, such that it could not be used as a reason to modify chicken prices. Indeed, prices responded to numerous other factors such as consumer expectations, competition with other meat products, international competition, supermarket buying power and European subsidies, such that the movement in lysine prices could not justify a change in chicken prices and Doux was not able to pass on such cost changes to its customers.

339. Finally, we note that the estimation of pass-on rates is based on observed data, i.e. relating to particular cost and demand conditions. The key issue is that these conditions may differ substantially from those which would have prevailed 'but for' the infringement in ways which may have affected the pass-on rate. Typically, however, experts may assume that the observed pass-on rate provides a sufficiently good approximation to deliver an estimate of how the overcharge has been passed on. Such assumptions should be made explicit and justified. Nevertheless, it might be possible to account for the influence of changing conditions on the pass-on rate using regression analysis, thereby refining the analysis.

IV.B.1.2. Correlation and simple regression analysis

340. A simple quantitative approach to analysing pass-on would consist of examining the statistical relationship between the price paid by the purchaser for the cartelised input and the price set in the downstream market by the said purchaser. For example, the expert might examine whether the input price and the product price sold by the purchaser downstream 'move' in parallel, suggesting a strong correlation between the two. A strong correlation would indicate that when the input price goes up, so does the downstream price. Evidence of this type would suggest the existence of pass-on, although it would not give any precise indication about the magnitude of the overcharge that is passed on. On the other hand, if there

¹⁸⁰ As a matter of French law at the time, claimants were charged with the burden of proving the absence of pass-on. This burden of proof is reversed under the Directive. See [Section II.D.2](#) above.

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is no correlation in the movements of these two prices, this provides an indication that there is no pass-on (provided naturally that the influence of confounding factors is not concealing such a relationship – see below paragraphs 348-359).

341. Although not clear from publicly available information, the claimants' expert in the *UK Air Cargo* litigation appears to propose an analysis based on correlation.¹⁸¹

342. The expert may explore the statistical relationship between the input price and the downstream price more formally by setting up a simple regression model. In particular, the expert may test the following relationship using regression analysis:

$$price = \alpha + \beta \text{ input price} + error,$$

343. In this simple regression, the coefficient β provides a measure of the statistical relationship between the input price and the downstream price.

344. If the regression is estimated using prices in level, in this case the interpretation of the β coefficient is straightforward. The results will indicate by how much the price of the downstream product would be elevated for every additional euro paid to acquire the input in question. For instance if $\beta = 0.3$, this means that for any €1 increase in the input price, there would be a corresponding downstream price rise of €0.3. If, instead the prices are expressed in logarithm, β is the pass-on elasticity between the two prices. That is, if $\beta = 0.3$, this means that a 10% input price increase would yield a 3% price increase on the downstream market.

345. In some cases, there is no price data available for the affected input or the relevant input represents a small proportion of total marginal cost, and in these cases the expert may consider using the estimated relationship between the price of a major input or marginal cost as a whole and the downstream price as a proxy, as discussed above (see paragraph 331). In this case, the coefficient may have to be scaled in proportion of the contribution of the input in question to marginal cost.

346. This approach is appealing because it relies just on price data. That is, only data on the price paid by the purchaser for the affected input (or other, major inputs) and the price charged on the downstream market are required.

347. The major drawback of this approach, however, is that this statistical analysis merely quantifies the correlation between two prices, yet even if this correlation

¹⁸¹ See **Box 38** in [Section V.C.](#) below.

is positive it may be spurious (see, for example, **Box 33**). Indeed, as already mentioned in [Section IV.A](#)), the downstream price may fluctuate for reasons independent of the infringement. In such a case, the correlation between the downstream price and the input price may either be inflated or deflated by the effect of these other factors. This problem can be alleviated by using multi-variable regression analysis that we discuss just below. Intermediate, less sophisticated, solutions may also be possible where market dynamics permit (e.g. margin analysis).

IV.B.1.3. Multi-variable regression analysis

348. If sufficient data is available, a robust econometric model can account for the influence of other confounding factors to quantify the impact of a change in total marginal cost (or that of the price of a major input) on the downstream price.¹⁸² Below we present the typical econometric approach to estimate the pass-on rate, τ , using data on the price of the affected input. In this case, the expert quantifies the pass-on rate with respect to that particular cost component directly. Alternatively, the expert may use data on total marginal cost (or rather data that may best be a proxy for total marginal cost) or may use data on the price of a major input. In such a case, because the infringement involves only one particular input, the expert will have to scale the pass-on rate using the share of the affected input in total marginal cost, as described previously (see paragraph 345 above). Again, this alternative approach assumes that the pass-on rate does not vary according to the source of the marginal cost change, an assumption which may need to be tested.
349. Furthermore, and importantly, regression analysis allows the expert to test whether the pass-on rate is constant or varies with the size of the cost change (see [Annex E](#)). That is, it may be the case that small cost changes may not be passed on with the same degree as large changes, notably due to the existence of 'menu costs'.
350. The details of the model specification will depend on the product in question and the main market features. By way of illustration, consider the flour example presented in the EC Practical Guide.¹⁸³ However instead of contemplating the effect of a flour cartel on the price charged to bakeries, suppose that the price of grain, the major input used by the competing milling companies was inflated because of a price fixing agreement between grain producers. To determine the extent to which the price of flour has been affected by an increase in the

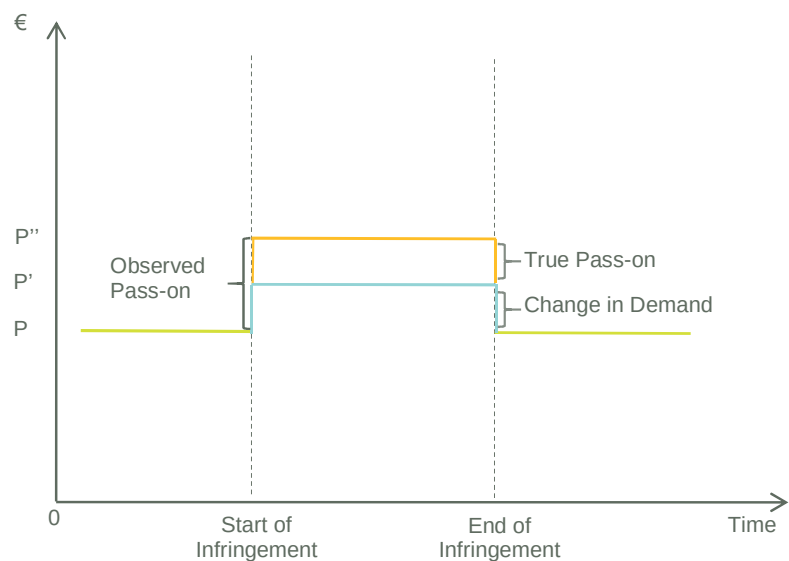
¹⁸² See EC Practical Guide at paragraphs 69-72 for a presentation of multivariable regression. From a mechanical perspective, multi-variable regression is an extension of a univariate regression, which includes only one single explanatory variable whilst multi-variable regression contains several, thereby potentially accounting for confounding factors.

¹⁸³ See paragraphs 73-78 of the EC Practical Guide.

price of grain, the expert can set up a multivariable regression. As explained in the EC Practical Guide, **this regression analysis accounts for the potential influence of other cost items** on the price of flour, such as the price of energy or labour costs in particular, thereby enabling the expert to disentangle the impact of the grain cartel from that of other cost influences.

351. It may also be necessary to **control for the influence of changes in demand conditions**, which could also affect the price of flour simultaneously but independently of the infringement. For example, demand for flour may be greater during the infringement period, causing price to be increased. **Figure 12** below offers a graphical illustration of this issue. In this example, demand for flour is higher during the period of the infringement, pushing up prices. A simple analysis would not account for this influence, thereby wrongly attributing the effect of demand on price to the increase in the cost of grain.

Figure 12: Accounting for the influence of demand



352. In the example above, failing to control for the influence of demand would overstate pass-on. However, if demand had fallen during the infringement period the opposite effect would occur. In that case, as a reduction in demand pushes prices down, a simple statistical analysis will lead the expert to understate the extent of pass-on.
353. Continuing with the flour example, the standard pass-on regression associating the price of grain with the price of flour can be written as follows:

$$\text{price flour} = \alpha + \beta \text{ price grain} + \delta \text{ other costs} + \theta \text{ demand factors} + \text{error}$$

where the dependent variable is the price of flour. The main explanatory variables are the price paid by the purchaser for grain and the prices of other major cost components, as well as demand factors that also affect the price of flour.

354. The parameter β represents the absolute rate of cost pass-on of grain prices to the price of flour. That is, for any €1 increase in the price of grain, the price of flour would change by β euros. If, instead, the regression is expressed in terms of logarithms, then this parameter would represent the pass-on elasticity, that is, the percentage ($\beta\%$) by which the flour price increases if the grain price increases by 1%
355. Cases in indirect purchaser litigation in the US generally rely on multivariable regression analysis. In addition to *In re CRT Litigation* (2013) (see **Box 24** above), *In re. Class 8 Transmission* is a case in point that illustrates some of the issues that arise in the assessment undertaken by courts (see **Box 33** below).

Box 33: *In re Class 8 Transmission*

***In re Class 8 Transmission Indirect Purchaser Antitrust Litigation*, 2015 U.S. Dist. LEXIS 142717**

In *Class 8 Transmission*, a lawsuit filed before the District Court of Delaware in March 2010, a class of indirect purchasers alleged that the Defendant, Eaton, a producer of transmissions for Class 8 trucks (e.g. heavy trucks), had entered into anticompetitive exclusive dealing agreements with OEMs that manufacture and sell Class 8 trucks, excluding ZF Meritor (a competitor in the transmissions market). As a result of the practice, indirect purchasers claimed to have paid an overcharge when they purchased their trucks. In 2015, the District Court dismissed the claimants' motion for class certification. At the time of writing, the decision was under appeal.

To obtain a motion for class certification, the court had to be persuaded that indirect purchasers had paid more than they should have absent the alleged anti-competitive practice. In this case, this required showing that OEMs, who had allegedly been overcharged for Eaton's transmission, had passed on (at least part of) the overcharge to direct purchasers (e.g. truck dealers), who themselves had passed on to indirect purchasers (end-users) - the claimants. Pass-on was, therefore, a critical issue.

The expert retained by the claimants conducted both a qualitative and quantitative pass-on analysis. The District Court ruling focusses only on the shortcomings of the quantitative work, while ignoring the theoretical claims made by the expert. In a nutshell, the expert made the following observations to support his claim that pass-on had occurred:

- The expert found that dealers operate in a very competitive market and face very inelastic demand for Class 8 trucks. On this basis, he concluded that passing-on is likely. The expert based his finding on company profile statements and market research reports. The expert also found from market search reports, trade press articles and confidential information that dealers operated their business under very low margins.

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- The expert also relied on market research reports as direct evidence of pass-on. Some of these reports expressly referred to pass-on in the industry. For instance, a market research report said that *"dealers [were] expected to pass-on price increases to end customers"* while another described the freight carrying trucking industry as atomistic and therefore subject to cost increases due to its *"weak bargaining position"*.

To provide quantitative evidence, the claimants' expert conducted several regression analyses. One pass-on analysis consisted of determining the extent to which the price (of Class 8 trucks) paid by indirect purchasers depended on what appeared to be the price invoiced by OEMs to direct purchasers (i.e. dealers). The expert used transaction level data provided by certain dealers. The regression analysis controlled for the influence of confounding factors, on both the demand side and the supply side. The results showed a 94.2% rate of pass-on between changes in invoice price and the price paid by indirect purchasers.

The court however denied motion for class certification finding the expert's report unreliable as to both the overcharge and pass-on analysis.

On pass-on, the court found the claimants' expert report to be unreliable for a number of reasons. In particular, the court was persuaded by the defendants' expert's view that the distribution of transmission is complex, involving multiple intermediaries between OEMs and indirect purchasers, and that such a *"complex distribution chain frustrates the process of determining the amount of pass-through on a transmission based on the price of a truck."* In addition, the court noted that *"[t]here has been no effort to correlate transmission...cost to truck prices"*.

The court also found that the data used by the plaintiffs' expert was not representative. It was based on data from two dealers in California, while the class concerned 11 States. It did not include sales data from two OEMs. It focussed only one type of transmission. In sum, the court found that in "no way" could an analysis undertaken using data for just 1% of total truck sales be sufficient to meet the claimants' burden of proof.

356. Because of the concern that the regression may omit potentially relevant factors, which would bias the regression results, there might be a tendency to include numerous control variables. This leads to two important remarks:

357. First, the so-called "omitted variable bias" arises when potentially relevant factors that are not included are also correlated with the explanatory variables. Continuing with the flour example, if demand factors are also related to the price of grain, then their omission generates biased regression results. In this case, the influence of demand on the price of flour would be wrongly attributed to the price of grain. Conversely, if changes in consumer preference are unrelated to any cost changes, then their absence from the analysis does not bias the results. For instance, if there is no data available to account for changes in demand conditions, but if it can be assumed that these changes are unrelated to costs, then the estimated pass-on rate without such control variables would be unbiased.

358. Second, the inclusion of irrelevant variables in the regression impacts negatively on the so-called efficiency of the ordinary least square estimator

(considered immediately below), which in practical terms means that the estimates are less likely to be statistically significantly different from zero.¹⁸⁴ Taking the flour example again, if the expert adds many control variables that are actually correlated with the cost variable but turn out to have no explanatory power impact on the price of flour, then the estimated pass-on may not be statistically significant. In other words, the expert may conclude in favour of no evidence of pass-on, while if these variables are excluded the results may become statistically significant.¹⁸⁵

359. When estimating the pass-on rate using regression analysis, the expert should have regard for the level of aggregation in the data. If the data is aggregated, the estimated pass-on rate would be an average over the set of units that are being aggregated (say over customers, products or periods). Such an average may mask important variation in pass-on rates. Instead, with more granular data, the expert may estimate different pass-on rates for different customers, products or time periods, for example.
360. In general, the regression model may be estimated using a standard ordinary least square (OLS) estimator.¹⁸⁶ However, the choice between three broad categories of dataset can affect the particular empirical strategy adopted. Specifically, the type of data affects the approach the expert may use to identify the relationship between the price charged by the relevant purchaser on the downstream market and the price of the input in question. In the following sections, we discuss specific estimation issues associated with each of these datasets in turn. In addition, in [Annex E](#) we introduce briefly some technical issues related to the estimation of the standard regression presented above in paragraph 353 and, in [Section V.D](#) we point to some of the scientific best practices which national courts can refer to (as well as reference manuals and criteria utilised in the US).

IV.B.1.4. Time series data

361. The expert can obtain estimates for the regression model parameters using time series data.¹⁸⁷ In practice, this involves collecting price data at a certain

¹⁸⁴ For more on the concept of statistical significance, see EC Practical Guide at paragraphs 86-88. Furthermore it is worth noting the trade-off between consistency of the coefficient estimate and inefficiency. However, as Cameron and Trivedi (2005) observe "*Since too many regressors cause little harm, but too few regressors can lead to inconsistency, microeconomic models estimated from large data sets tend to include many regressors.*" at page 93, *Microeconometrics, Methods and Applications*, 2005.

¹⁸⁵ Note that if instead the expert adds control variables that are not related to the cost variables (hence their omission would not bias the result) but have explanatory power, this would reduce the regression standard error, thereby increasing the precision of the estimated pass-on rate. See Cameron and Trivedi (2005) at page 93.

¹⁸⁶ See EC Practical Guide at paragraph 75.

¹⁸⁷ See the Oxera Report for an introduction of time series data in the context of antitrust damage estimation, notably section 3.4 "Comparator-based approaches: time series."

frequency over a period of time. For example, the expert may obtain monthly price data over a period of several years. If this is done in the case of the flour example, the resulting coefficient β will capture the average impact of fluctuations in the price of grain over time on the price of flour, using monthly variation. Alternatively, if only annual data is available (or monthly data is aggregated to yearly frequency) then β gives an estimate of the average pass-on rate using only annual variation.

362. The expert should consider the frequency of the data with care. On the one hand, if the data frequency is high (weekly/monthly), the series might show more variation than with low frequency data (quarterly/yearly). For example, monthly positive and negative shocks in the price of the input in question might cancel each other out when data is aggregated on a yearly basis. If the downstream price responds to these shocks also on a monthly basis, aggregating the data to a lower frequency will tend to mask the statistical relationship between the input price and the downstream price. On the other hand, high frequency data may fail to adequately reflect the relationship at issue. For instance, the purchaser may adjust downstream prices every quarter, therefore weekly changes in the price of the input in question will not reflect that relationship. In such a case, the expert may consider aggregating the data to the quarterly level. In addition, high frequency data (e.g. monthly data) may exhibit a seasonal pattern, which may also mask the relationship at issue, and should thus be accounted for.¹⁸⁸
363. If the model is estimated using data from both infringement and non-infringement periods, but without distinguishing between the two, the estimated pass-on rate will be an average over both periods. In this case, the expert implicitly assumes that the pass-on rate is the same, irrespective of the period. This assumption should be tested. For instance, if the pass-on rate is higher during the infringement period, using the average rate over both periods understates the actual rate at which the overcharge is passed on. The converse is also possible. One simple way to address this issue would be to estimate two pass-on rates, one for the infringement period and the other one outside that period; such an approach would work well if there is sufficient data available for the periods both during and outside the infringement period (which may prove a challenge in the case of long-lasting cartels).
364. When using time series data and regression analysis, the expert must have regard to a number of technical issues that commonly affect statistical inferences about the pass-on rate estimate, namely:

¹⁸⁸ High frequency data is also more likely to give rise to the serial correlation issues that are discussed in this section.

- Serial correlation in the error term (also termed auto-correlation). Serial correlation arises when the error terms are correlated over time. This happens in particular with price series, since prices which were high yesterday tend to be high today. This technical issue affects in particular the precision of the estimated pass-on rate, and in particular the statistical significance of the estimate.¹⁸⁹ It is therefore critical that the expert confirms that the regression results are not affected by this technical issue. See **Box 34** below.
- Stationarity issues. The standard statistical inference is also impacted when the price series in question are said to be “non-stationary”. In such instances, two “non-stationary” variables may appear to be related when in fact they are not. This could be the case for example when the expert investigates, the relationship between the price of the input in question and the downstream price when in fact there is none. Price series are called non-stationary when either their mean or variance changes over time. For example, a price is non-stationary when it evolves in such a way that it does not return or fluctuate around a particular central value. See **Box 35** below.

Box 34: Serial correlation in the error term.

When regression analysis is used with time series data, the expert must have regard for the potential serial correlation problem in the error term (also known as autocorrelation). This problem often arises with price data because price series tend to be correlated over time. That is, the price of flour, say, in any given month is often related to its price in the preceding month. Even though the explanatory variables included in the regression model may pick up some of this serial correlation, any residual effect will be contained in the error term of the regression. As a result, these errors may be positively correlated over time. The major implication of this is that the coefficient estimates obtained, notably β , will appear to be more precisely estimated than they really are. Specifically, the expert may conclude that the pass-on rate, β , is statistically significantly different from zero, when in fact it is not. In other words, the expert would conclude that the relevant purchaser had passed on the overcharge when, in fact, the regression results do not support such a conclusion.

In general, there are two ways to deal with the serial correlation problem. First, the expert can transform the regression model, by including lagged explanatory variables to eliminate serial correlation in the error term. This changes radically the model specification, and in particular, if lagged cost variables are included, then the model gives short and long term pass-on rates. Second, the expert may use a different approach to estimate the precision of the coefficient estimates, given by the so-called standard errors, by adjusting these for the potential bias that is caused by serial correlation.

¹⁸⁹ The EC Practical Guide provides a brief description of statistical significance at paragraphs 86-88.

Box 35: Stationarity vs non-stationarity

When estimating a time series model that relates the downstream price to the price of the affected input, the expert must examine so-called non-stationarity issues, which arise, for example, when a price series follows an upward trend, which implies that prices never revert back to a particular central value but keep increasing. The major problem that would arise if both the downstream price and the input price are non-stationary is that the regression results would mislead the expert to conclude in favour of the existence of considerable pass-on. In fact, the statistical relationship between the downstream price and the price of the input in question may be spurious.

Ignoring non-stationarity may thus lead the expert to find a relationship when there is none. Hendry (1980) offers a striking illustration. Cumulative rainfall in the UK is found to be highly correlated to the price index. Even if these two variables have no underlying relationship, they may therefore appear to be related because they both follow a similar time trend. This is an example of so-called 'spurious' regression, a term coined by Granger and Newbold (1974). When the variables in a regression are non-stationary, relevant statistics (such as "R-squared" values and "t-statistics" measuring the fit of the regression model to the data and the statistical precision of the coefficient estimates, respectively) can be substantially inflated, thereby deceptively suggesting that the variables are related.

The expert should, therefore, conduct diagnostic tests in order to determine if the price series are non-stationary or not. To this end, a number of statistical tests are available, notably the family of so-called Dickey-Fuller tests. Their description is beyond the scope of this report however, but the reader may consult Hamilton (1994) *Time Series Analysis*, Chapter 17.

If the time series in question are found to be non-stationary, the expert may consider assessing whether they have a long-term stable relationship (in technical terms, whether they are co-integrated - a technical concept that is described in Chapter 19 of Hamilton (1994)), which can be quantified. Alternatively the expert may transform the variables so that they become stationary, i.e. the analysis focusses on consecutive price changes and not price levels. Using the latter option, the expert may estimate a regression model in first-differences, i.e. the model is transformed so that all variables are simply the difference between two consecutive periods. In this case, if the transformed variables (in first-difference) are stationary, the coefficient estimate β continue to measure the change in price caused by a change in input cost.

IV.B.1.5. Cross-section data

365. The expert may also use cross-sectional data to estimate the pass-on rate regression model presented above. A cross-section of data contains information on price and cost, for example, over several products, firms or market at the same point in time. Typically, this involves collecting data in different geographic markets and/or for various products. For example, the expert may gather data on the price of flour and the price of grain across a number of local markets, and then exploit the variations in prices across these markets to estimate the pass-on rate.
366. This approach may shed light on pass-on if the price of the input in question varies across markets or across products, depending on the nature of the cross-section. If the price of the input in question is the same regardless of where

the downstream products are sold, then cross-section analysis will not provide enough information to estimate pass-on, even if the downstream prices vary across markets or products. For example, even though the price of flour may vary across local markets for a number of reasons, there might be a single geographic upstream market for the supply of grain. In this case, save for transportation (or logistic cost), the price of grain will be uniform across local markets. In this context, the regression set up above is unlikely to reveal a relationship between the price of grain and the price of flour, yet this is not because there is no pass-on, rather it is because the cross-section data is bound to be inadequate in this case.

367. The issue of confounding factors already discussed above (see paragraphs 350 and 351 above) is particularly relevant with cross-section data. For example, the price of flour could be high in some local markets due to strong consumer demand that result from the fact that in these markets pastries or bread could be more popular than in others. Consequently, bakeries in those markets might be willing to pay a higher price for flour. This example underscores the need to control for the potential influence of variation in consumer demand on prices, but other factors may also matter, notably differences in the intensity of competition or local cost conditions.
368. The expert may also consider other issues that are specific to this type of dataset. For instance, cross-section data cover only one period. That is, the price of flour in our example may be an average over a one-month period or over an entire year. In any event, if the period considered is outside the infringement or only partially overlaps with it, then data for affected products or markets may not actually reflect the effects of the overcharge.
369. Finally, the expert must have regard to the so-called “heteroscedasticity” problem, an issue that arises frequently with cross-section data and which can have a significant impact on statistical inference. See **Box 36** below. In practical terms, if the expert fails to correct this problem, he or she may conclude that the coefficient estimate of β is statistically significant when in fact it is not. The opposite can also happen.

Box 36: Heteroscedasticity

When regression analysis is used with cross section data, the expert must consider the potential heteroscedasticity problem in the error term. For example, if the expert compares prices across local markets, it might be that there is more price dispersion in markets with high income population than in low income markets. This is because the high income population might be more flexible in spending, given rise to a heterogeneous consumption pattern and thus more price dispersion, while for low-income households there is not much variation. Such situation would give rise to heteroscedasticity, which in technical terms means that the (conditional) variance of the error term is not constant, where the variance is a measure of dispersion.

In the presence of heteroscedasticity, the classical standard errors that assume that the variance of the error term is constant, are no longer valid. The solution to this problem is to compute so-called "heteroscedasticity-robust standard errors". Without such an adjustment, if there is heteroscedasticity the expert may conclude that the pass-on rate, β , is statistically significant when in fact it is not. Or alternatively, she may conclude that β is not statistically significant when it is.

IV.B.1.6. Panel data

370. A panel dataset includes data for several geographic markets or products over several time periods, allowing the expert to compare prices over time and across markets or products. Essentially a panel dataset is a collection of cross-section data repeated over time. The issues discussed above about time series data and cross-section data also apply here. However, when available this type of dataset should be preferred to purely time series or cross-section datasets. By combining variations over time and across products/markets, this type of dataset is often richer, enabling the expert to uncover relationships that may not have been discernible otherwise.
371. The main advantage of this type of data is that it is possible to control for potential unobserved but time invariant differences between markets or products depending on the unit of observation. For example, if the analysis focusses on the price of flour in local markets, it is possible to account for the influence on price of all unobserved time invariant differences between these markets, without actually collecting information on demand and cost condition. To this end, the expert will use the so-called fixed-effect estimator. When the period is short, it may indeed be reasonable to assume that any unobserved differences in demand or cost conditions have not varied during the sample period. To continue with the flour example, the expert may use the fixed-effect estimator to control for the influence of unobserved differences in consumer preference across local flour markets, without having any data on demand conditions in local markets.
372. If the expert employs a fixed-effect estimator, however, it is important to note that the average price difference between the markets is eliminated by the fixed effects, and therefore only the time variation is used to estimate the pass-on rate. This impacts the empirical strategy. To illustrate the point, consider the flour example again. With a fixed estimator, the estimated pass-on rate will be based on the impact of changes in the price of grain on the price of flour in individual local markets. If the expert only uses data during the period of infringement, and if the price of grain is high (because of the infringement) but does not fluctuate, then the estimated pass-on rate will be automatically zero (or close to it). This may not be a reliable result, however. Alternatively, if the expert employs data in the infringement and non-infringement periods, the

price of grain may have gone up and down because of the infringement, and in this case the estimate is more likely to provide a reliable account of pass-on.

IV.B.2. Direct estimation of the passing-on effect

373. To quantify the passing-on effect directly as set out in Section IV.A.3.1 above, the expert estimates the relevant purchaser's price increase ($p_1 - p_0$) that has been caused by the upstream overcharge. To be clear, this approach can be employed to quantify the potential price rise that direct purchasers or indirect purchasers impose on their own customers when confronted with an increase in the price of the input at issue.
374. To this end, the expert may use one of the comparator-based methods that have been presented by the EC in its Practical Guide and are also discussed in the Oxera Report.¹⁹⁰ These methods are relevant to the quantification of overcharges. However, in this document we will only focus on issues that pertain to the estimation of the (direct or indirect) purchaser price increase, and refer the reader to these other documents for a more general presentation of these methods.
375. As indicated in the above sections and in other studies, there are three main types of comparison that can be used to compute the passing-on effect, namely:
- comparison with a benchmark product or another geographic market (cross-section data);
 - before and after comparison (time series data); and
 - difference-in-differences approach, which involves a comparison overtime and across markets (panel data).
376. In each case, the objective is to find a suitable comparator, typically a product similar to that sold by the relevant purchaser but whose costs have not been affected by the infringement. Specifically, the expert will compare the price realised by the relevant purchaser (direct or indirect) with that for the comparator product. As a minimum, data on the price of the product sold by the purchaser and on the price of the benchmark are required to undertake this type of analysis.

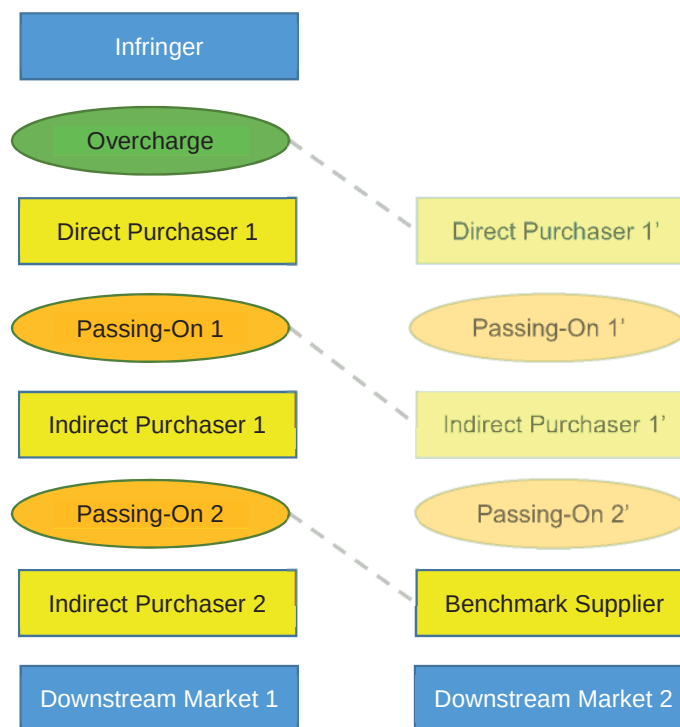
¹⁹⁰ See paragraphs 32-95 of the EC Practical Guide and sections 3.3, 3.4, and 3.5 of the Oxera Report.

IV.B.2.1. Comparison with a benchmark product or another geographic market

377. One way to estimate the purchaser price increase caused by the infringement is to compare the price of the product in question with that of the same product sold in a separate geographic market (e.g. the price of carbonated soft drinks sold in Germany may be affected by a sugar cartel, and thus can be compared with the price of carbonated soft drinks in other European countries that are not affected) or a sufficiently similar product sold in a different product market (e.g. the price of sugar-based carbonated soft drinks may be compared with sugar free drinks).
378. Importantly, in each case, the comparator product should not be affected by the infringement. However, because the characteristics of the benchmark product should be similar to that of the product whose price is at issue, this often implies that **these products use the same input**, in which case, it might be difficult to find a suitable, i.e. unaffected, comparator. In particular, if the scope of the upstream infringement covers the world, or a broad geographic area such as the EEA (for example, the Vitamin Cartel), it is likely that similar products to the product in question, which rely on the same input, have been potentially affected, making it difficult to find a suitable benchmark in a different geographic market. For example, food producers in France that purchased vitamins may have passed on the impact of the cartel overcharge. However, to determine the extent of that price increase, comparing the price of food items that these purchasers sell in France with those in other European countries would be unreliable since food producers in those other countries have potentially also been affected by the Vitamin Cartel. Such a comparison therefore risks understating the price increase caused by the overcharge and, thus, the magnitude of the passing-on effect.
379. The critical issue of finding a suitable benchmark product might be even more of a challenge when the question of passing-on concerns **indirect purchasers**. In these situations it might not always be straightforward to find a suitable product benchmark that was not potentially impacted by the infringement. Below we set out a number of situations in which the candidate benchmark product would not be suitable.
380. **Tracing the impact of the overcharge down the supply chain.** When the relevant purchaser is further down the supply chain, it is important to trace the potential impact of the overcharge down that chain when selecting a benchmark. This is because the supply chain may split out in several branches, and the overcharge may affect all of these to various degrees.

381. Consider a situation such as that described in Scenario 3 (see **Figure 8** above), in which Indirect Purchaser 2 claims damages against the upstream **infringer**. The expert may identify a candidate benchmark product whose manufacturers do not purchase inputs from Indirect Purchaser 1. However, this does not guarantee that the infringement that took place upstream had no impact on the candidate benchmark product. For instance, the manufacturers of these similar products may purchase their input from producers who themselves have bought from the Direct Purchaser, or from other suppliers who buy from the infringer. In such cases these products may not represent suitable benchmark choices.
382. **Figure 13** below illustrates these issues. To determine whether the price of the benchmark product provides a suitable basis for comparison, it is important to examine the supply chain to identify whether, at some stage, there has been any link to the upstream infringement.

Figure 13: Tracing down the overcharge

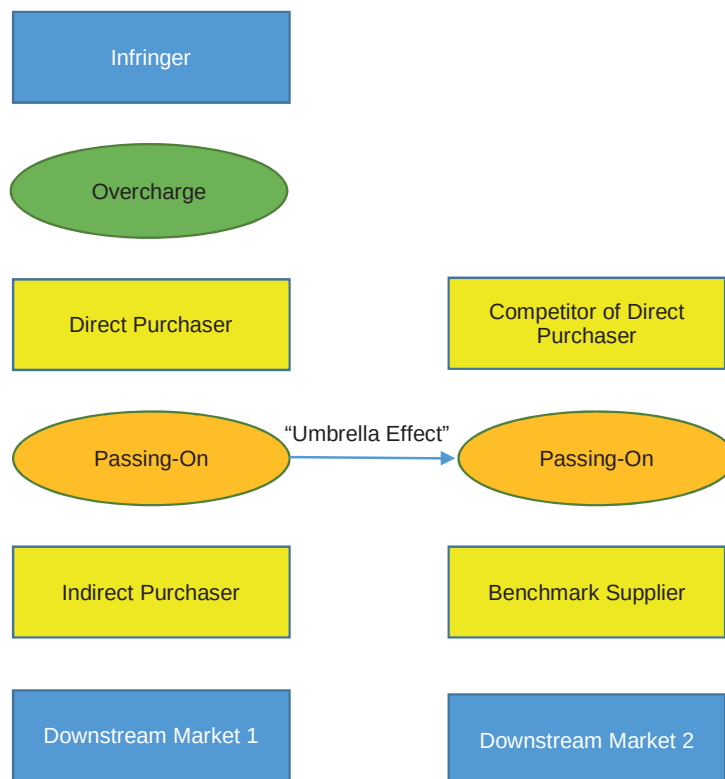


383. **The umbrella effect.** Consider a situation such as that described in Scenario 2 (see **Figure 8** above), in which Indirect Purchaser 1 is claiming damages from the upstream infringer. To determine whether Indirect Purchaser 1 passed on any of the original overcharge, the expert proposes a comparator-based

method and identifies a similar product to that sold by Indirect Purchaser 1, which does not make use of the affected input (either directly or indirectly). *A priori* this might seem to provide the **basis** for a valid comparison.

384. However, the supplier of the candidate comparator product may purchase inputs from suppliers that are in direct competition with the Direct Purchaser, albeit they do not use the inputs supplied by the Infringer. This situation is sketched in **Figure 14** below. This implies that if the Direct Purchaser raised prices in response to an illegal increase in the price of one of its inputs, its competitors may have raised their prices as well (see [Section III.B](#)). In this case, the cost of the **benchmark** supplier may have been indirectly impacted by the infringement, and as a result, its price may not provide a suitable comparison.

Figure 14: The Umbrella Effect



385. Once a suitable benchmark product is found, the expert can compare its average price with that of the product in question. The advantage of this approach is thus its computational simplicity, as well as its limited data requirement. It suffices to gather data on prices of the product in question and of the benchmark product.

386. Because comparing averages in this way can be unreliable, the expert may consider employing a regression analysis to control for confounding factors that may also explain price difference between the product in question and its benchmark.

IV.B.2.2. Before and after comparison

387. The expert may compare the price of the product sold by the relevant purchaser before or after the infringement period with that of the same product during the infringement period. For example, if the price of the product at issue was €2 during the infringement period but fell to €1.90 after the infringement ended, the expert might conclude that the downstream price was increased by €0.10 as a result of the infringement. However, this approach is predicated on the assumption that the infringement period can be identified sufficiently precisely, and also that the effect of the overcharge is limited to that identified infringement period (as well as that significant confounding influences are absent).
388. The advantage of this 'through time' approach is that the comparison focusses on the price of the same product. Therefore, unlike the cross-sectional approach described above, there is no need to determine whether the benchmark product was directly or indirectly impacted by the infringement.
389. However, this approach also has some potential drawbacks. First, even though the decision of the competition authority may identify dates at which the infringement started and ended, **in reality the effect of the infringement may not be limited to the officially-identified period**. For example, the official start date for the infringement reported in the authority's decision may post-date the true start point by some time, perhaps because of a lack of reliable evidence to establish this incontrovertibly or because of limitation periods excluding certain conduct from the scope of decisions pursuant to applicable administrative law. As a result, the overcharge may have existed even before a breach of competition law is officially identified. Similarly, the last infringement date identified officially may pre-date the actual end of the infringement. Naturally this impacts the quantification of the initial overcharge. Logically, it also affects the estimation of the purchaser price increase, for the same reason.
390. Importantly, the effect of the infringement may not be limited to the duration of the infringement either. For example, once a cartel ends it may take time

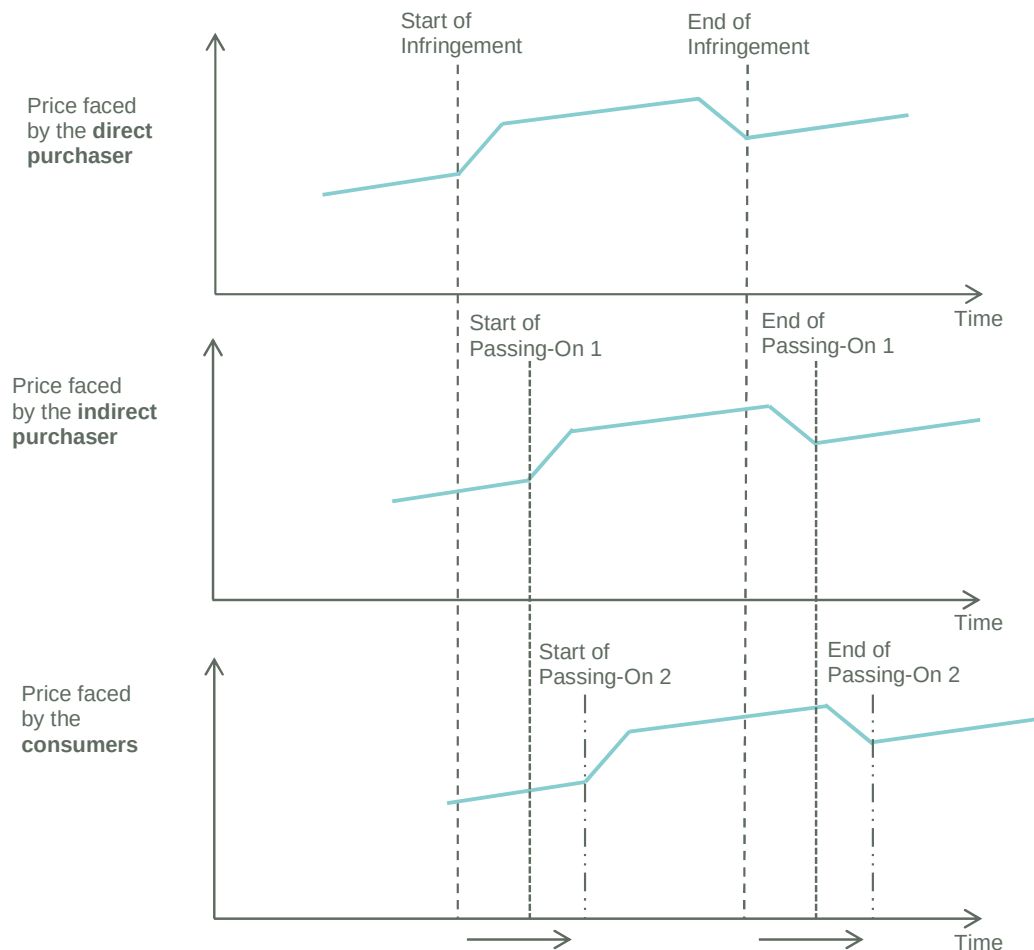
for prices to return to the competitive level.¹⁹¹ Alternatively, contracts may fix prices beyond the end of the infringement period.

391. Failing to account for the fact that the effect of the infringement may extend outside the official infringement period could lead to the passing-on effect being understated. Suppose, for example, that the expert uses post-infringement data to benchmark the (direct or indirect) purchaser's prices during the infringement period. If the effect of the infringement persisted beyond the official end-date of the infringement, then the purchaser's cost will have remained high as well. If, in turn, the purchaser passed on part or all of that illegal cost increase, the price it charged to its own customers will have continued to be elevated as a consequence of the infringement. In such a situation, the expert may understate the impact of the overcharge on the purchaser's price, and, as a result, may understate the passing-on effect.
392. In other cases, the infringer may have set its price below the competitive level after the infringement, at least temporarily. For example, the end of a cartel may have been characterised by a short price war period, during which the price level was unsustainably low. Indeed, such an episode may have been triggered by the defection of one cartel member, who may have also applied for leniency. The low price could be the result of a temporary, but aggressive and unsustainable, reaction. In such a situation, the price of the affected input may have decreased sharply for a period, and if that change to the purchaser's cost was passed on, downstream prices would have been unusually low for a period too. In this case, the over-time comparison would overstate the passing-on effect.
393. One possible solution to these issues would be to exclude the immediate pre- or post-infringement periods from the construction of the relevant counterfactuals, and instead use periods that are more distant. Of course, the risk in doing so is that other confounding influences may become increasingly relevant as the time period that separates the benchmark period from the affected period increases.
394. **Time lags in passing-on.** The possibility that purchasers at different stages of the supply chain may delay passing on the overcharge can also affect the comparison significantly. In fact, as we show below, if the delay is substantial, comparing downstream prices during and before or after the original infringement may not provide an appropriate estimate of the downstream passing-on effect.

¹⁹¹ See, for instance, EC Practical Guide at paragraphs 44-46.

395. To illustrate this issue, suppose that producers of carbonated soft drinks only adjust prices once a year. This is because, in the example, producers negotiate prices with large retailers on an annual basis. These annual negotiations might start a couple of months before the parties are due to finalise new prices. If sugar producers form a cartel that commences and leads to an increase in sugar prices when the annual negotiations between the carbonated soft drinks producer and the retailers are ending, it is only when the next year's annual negotiation takes place that carbonated soft drink producers may have had an opportunity to pass on part or all of the sugar price increase in their own prices.
396. Suppose the expert uses the established dates of the sugar cartel as a basis for establishing the period when the carbonated soft drink producer's price was affected, and compares prices during this period with those prevailing during the pre-infringement period. In this case, because the price of carbonated soft drinks to retailers did not increase immediately when the sugar cartel commenced, the average price computed over the infringement period may understate the extent of the passing-on effect.
397. The effects of such delays may be compounded when the passing-on behaviour of indirect purchasers is considered (see **Figure 15** below). There may be a first delay before the direct purchaser's prices respond to the impact of the initial overcharge. Then, there may be a further delay before the indirect purchaser increases its prices. As a result, it might be difficult to pin down exactly the relevant period for any during and before or during and after price comparison. For example, suppose that the infringement lasts for one year but at each stage of the supply chain purchasers take three months to adjust prices. This could have a material impact on the estimation of the downstream passing-on effect if downstream price comparisons are based on the period of the original infringement.

Figure 15: The effect of delayed passing-on



398. Experts may consider investigating the extent of the possible delay in passing-on and, on that basis, adjust the analysis by introducing a suitable time lag. This can be done by examining the pricing policy as illustrated in the example described in paragraphs 395-396 above. In addition, if regression analysis is being employed, experts may consider examining the regression residual for specific patterns notably around the potential start and end dates of the infringement. Indeed, if the regression model is wrongly specified because of the time lag in passing-on, this might be detected in the residuals.

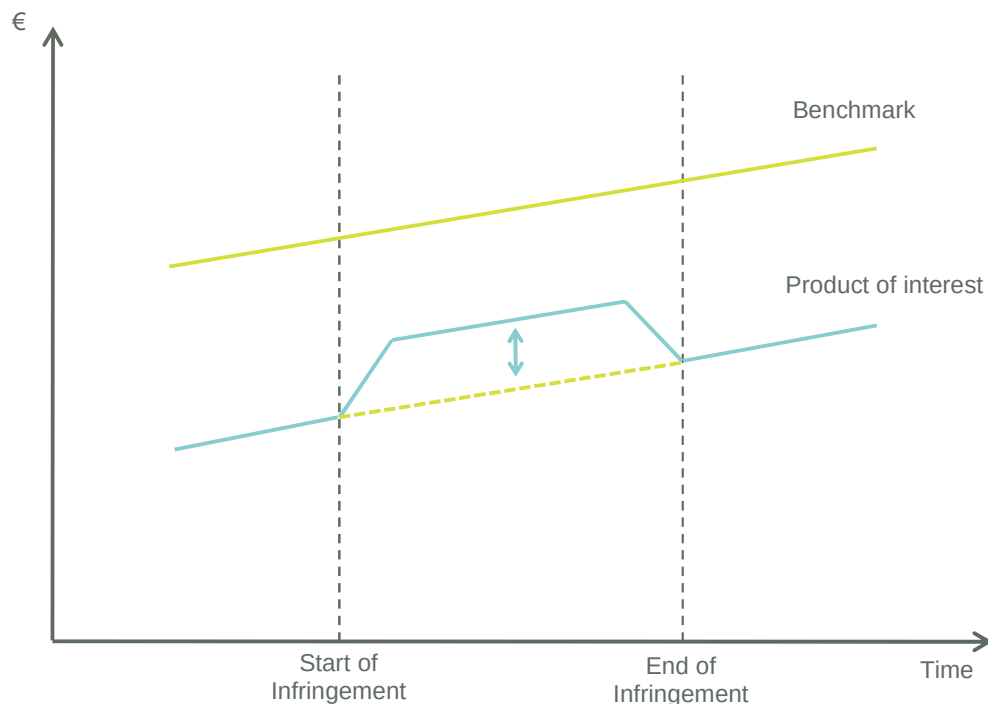
IV.B.2.3. Difference-in-differences approach

399. The expert may consider combining over time comparison with across products (or markets) comparison. This so-called "difference-in-differences" method is,

in principle, superior to the two comparator-based methods described above (i.e., comparison over time and comparison across markets) as it controls to some extent for unexplained price differences, whereas the other methods do not. Finding a reasonable benchmark product is often very challenging, because it is so difficult to control for all other factors that might bring about a difference in prices. A difference-in-differences approach can take account of such differences, providing always that these remain constant over the period of the comparison. This is a critical assumption, which, if it cannot be sustained, would cast doubt on the reliability of this approach.

400. **Figure 16** provides a simple sketch to illustrate the logic of the difference-in-differences method, highlighting the importance of the critical assumption that the differences remain constant over the period. As can be seen, the price trend of the benchmark product is used to generate the price evolution of the product of interest in the absence of the infringement. The difference between the actual price and the counterfactual level gives the price increase.

Figure 16: The Difference-in-Differences Method



401. To illustrate, consider that the expert compares the price movements of two similar products that are sold in the same geographic market, but only one of which uses the input that is the object of the infringement. In this case, the

expert can compare the price difference between the two products and examine whether this difference changed during the infringement period. For example, suppose that a producer of carbonated soft drinks sells different versions of its main product, some of which do not use sugar. Suppose too that the cost of the producer's sugar-based carbonated soft drinks was inflated because of an infringement affecting sugar prices. The expert may compare the prices of the (affected) sugar-based drinks and (unaffected) non-sugar-based drinks to estimate the passed-on effect of the overcharge resulting from the infringement. Consider also that the data shows that the average price of the sugar-based drink fell from €3 during the infringement period to €2.80 after the infringement, while at the same time, the sugar-free drink, which is more expensive, saw its average price stay at a constant level of €3.20. This implies that, in the absence of the infringement, the price of the sugar-based drink would have been at the same level as post-infringement, at €2.80. That is, the overcharge which has been passed on to the soft drinks producer is €0.20.

402. Formally, the difference-in-differences can be computed as set out in **Table 3** below.

Table 3: Unit mark-up and pass-on

	Infringement period	Post-infringement period	Differences
Sugar based	€ 3	€ 2.8	(a) = € 3 – €2.8 = € 0.2
Sugar free	€ 3.2	€ 3.2	(b) = € 3.2 – € 3.2 = €0
Difference in differences			(a)-(b) = €0.2

403. This example is particularly simplistic, since the price of the benchmark stayed constant, a circumstance that may often not be the case in practice (also seen in **Figure 16** above).

404. This example also highlights that the choice of benchmark may not be straightforward. There is indeed no guarantee in this particular example that the benchmark product will be unaffected by the infringement. For instance, the umbrella effect described above may lead to the prices of non-sugar carbonated soft drinks being inflated too. If sugar-based and sugar-free drinks are viewed as substitutes by consumers, and the prices of sugar-based carbonated soft-drinks are inflated as a result of the infringement, then this may, in turn, lead to the price of sugar-free drinks to be elevated. In this case,

the calculated pass-on effect can, therefore, be considered as offering a lower limit for the actual pass-on effect.

405. Alternatively, if sufficient data is available, the expert may consider a separate geographic market as the benchmark.

IV.B.3. The counterfactual margin

406. As indicated in Section IV.A.4 above, to quantify the output effect the expert must obtain an estimate of the counterfactual unit margin for the claimant. As indicated above, only when the pass-on is 100%, that is when every euro increase in cost is passed on, would the unit margin remain the same. This means that it cannot be assumed *a priori* that the observed margin during the infringement period provides a reasonable proxy for the counterfactual margin. There are several ways to estimate the counterfactual margin:

- The expert may estimate the counterfactual unit margin using the same comparator-based methods already described above for the downstream price increase.
- The expert may use the pass-on rate, if available, and apply this to the unit overcharge to obtain the downstream price change. With this information it is straightforward to derive the counterfactual margin.

407. We discuss specific issues related to each of these approaches in turn.

IV.B.3.1. Using comparator-based methods

408. The objective would be to obtain the unit margin that the purchaser would have earned absent the infringement, using comparator-based methods. The methods may use through time comparisons or cross-sectional comparisons, as well as a difference-in-differences approach. Naturally, a suitable benchmark should be free of the influence of the infringement. All the issues presented above would also apply here.
409. The advantage of a 'through time' approach is that data on the purchaser's margin may be readily available, and can thus be compared in different periods. It might be more difficult to find data in other geographic markets or for similar products.
410. These methods rely on the assumption that the benchmark would consist of a similar product sold in markets with similar characteristics or that the pre- or post-infringement periods are similar to the infringement period except for the effect of the infringement itself. However, this assumption is often not tenable.

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For instance, costs that are not related to the infringement may not be completely similar across geographic markets, or the benchmark product may not have the exact same characteristics as the product in question. Many of the issues pertaining to finding a suitable benchmark are already discussed in paragraph 379 above and the EC Practical Guide provides a comprehensive overview of these issues.¹⁹²

411. The validity of such analysis will also depend on being able to obtain appropriate margin and cost information from a firm's financial records. In principle, fixed costs, which will not have changed as a result of the volume loss, should not be included in the relevant margin measure. Suppose, for example, that the claimant suffers a reduction in output of 10 units. This reduction will have saved the purchaser the costs associated with supplying those 10 units. Hence, the relevant measure of costs will typically include only variable costs and not fixed costs. If, instead, the margin calculation also takes account of unaffected fixed costs, the loss of scale associated with pass-on will also reduce the purchaser's margin. In this case, any comparison with a counterfactual margin will overstate the pass-on effect.
412. Fixed costs, which will not have changed as a result of the output contraction that results from a price increase should not be included in the relevant margin measure. At the same time, if the effect of the infringement is sufficiently large and prolonged, the purchaser may suffer such a reduction in output that it may have had to scale back its operations (e.g. production capacity), such that certain fixed costs were avoided as well. In summary, the margin should be net of avoidable costs, that is, costs (whether considered variable or fixed) which have been saved as a result of the output reduction.
413. Due to the need to distinguish carefully between avoidable and other costs, the relevant measure of costs that is required will typically not correspond directly to the accounting data recorded by firms in the normal course of business. Adjustments may therefore be needed to arrive at an appropriate economic measure of avoided costs. (For example, it may be that some fixed and common costs have been allocated to individual product lines, and need to be stripped out. Where such adjustments are not possible due to the way the data are kept, any upward or downward biases in the estimated counterfactual margin should be identified by the expert.¹⁹³)

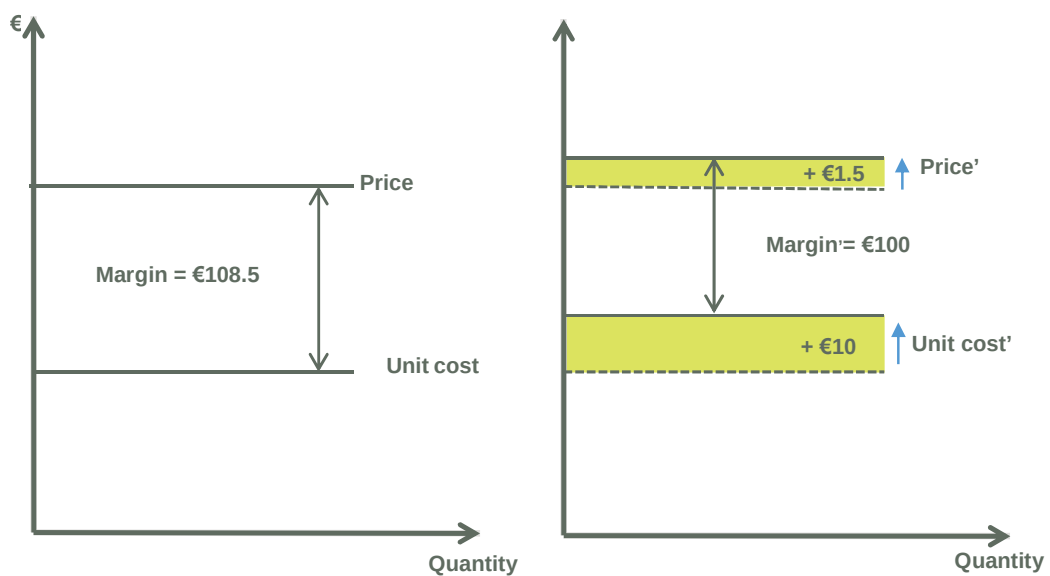
¹⁹² See in particular the discussion on finance-based methods in the EC Practical Guide, and notably paragraph 111.

¹⁹³ See also paragraph 418 and [Section IV.C.4](#) in relation to this issue.

IV.B.3.2. Using the pass-on rate

414. To obtain the counterfactual margin, the expert may use the pass-on rate that has been estimated or derived and, when combined with the unit overcharge, it is possible to obtain the downstream price increase. With this information, the expert can easily calculate the counterfactual margin (see the illustration in **Box 37** and **Figure 17** below).

Figure 17: Realised and counterfactual margin



415. The same approach can be used if the expert has, instead, directly estimated the effect of an increase in the price of the input in question on the downstream price. It is then straightforward to estimate the margin that would have applied absent the infringement.

Box 37: Illustration of recovering the counterfactual margin

Suppose that the unit margin observed during the infringement period is €100. The expert estimates that only 30% of a €5 per unit overcharge affecting that particular input was passed on. Since two units of the input in question are used in each unit of the downstream good, the unit cost of the latter is increased by €10. However, the price per unit of the downstream good is only elevated by €1.5. Because the claimant absorbed part of the overcharge, this implies that its margin is reduced (as shown in the figure above, the margin is higher before the cost increase). This means that, all else being equal, the observed margin (€100) is too low, and it should be increased by €8.5 to €108.5 (absent the infringement, the unit cost would have been reduced by €10 and the price by €1.5) to obtain the counterfactual margin.

416. This approach is appealing for several reasons. First, it is economical. That is, if the expert has already estimated the relevant pass-on to quantify the passing-on effect, this can also be used to quantify the volume effect using readily available data on the purchaser's margin during the infringement period.
417. Second, in principle the expert need not be concerned with additional changes in costs (unrelated to the infringement) or changes in demand conditions that affect prices. Indeed, as the starting point is the realised margin during the infringement period, there is a priori no need to control for the influence of potential confounding factors in this case. To arrive at the counterfactual margin, the expert only needs to transform the realised margin with the pass-on rate and the cost overcharge.
418. There are however a few issues that may compel the expert to make some adjustments to the purchaser's cost data because the infringement has had an additional impact on costs beyond the overcharge effect that should also be taken into account. There are at least two types of effect the expert must consider:
- **Input substitution:** if the purchaser, because of its higher price, has substituted the affected input partly with others, this may have mitigated the impact of the overcharge, but on the other hand this has raised the cost of other inputs. In such a case, the expert must also account for this effect when estimating the counterfactual mark-up. After all, the cost of other inputs would be lower in the absence of the infringement, therefore some adjustment must be made as otherwise the counterfactual mark-up would be too low.
 - **Economies of scale:** In principle, experts will use gross margin (net of variable costs). However, in practice it may not be straightforward to distinguish fixed and variable costs. If the purchaser incurs high fixed costs, this means that any output expansion could cause average total cost to fall substantially, and in this case, experts will have to consider whether such economies of scale also impact the measure of margin that is being analysed. If indeed the measure of margin is tainted by such effects, the greater volume the claimant would have sold had the infringement not taken place, would also have resulted in a smaller margin.
419. Note that these effects, although real, may be difficult to identify quantitatively. Nevertheless, the expert may find qualitative evidence that the purchaser reduced the impact of the cost increase by employing other inputs more intensively, and that this in turn has raised the costs associated with these inputs. It might not be easy to quantify this additional cost increase, which would have to be deducted to estimate the counterfactual margin.

IV.B.4. The counterfactual volume level

420. To estimate the volume effect using the Direct Approach or the Counterfactual Volume Approach, the expert must obtain a measure of the counterfactual level of output. In principle, the expert may use the same comparator-based methods that are discussed above in the context of estimating directly the pass-on. The issues presented apply in this case as well. However, unlike prices, sales volumes are more likely to follow a trend (up or down), which would have to be accounted for to predict the counterfactual volume level.
421. In principle, subject to data availability, it might be relatively easy to compare sales of the product in question during and outside the infringement period. If the relevant purchaser passed on the overcharge, even partially, its volume of sales must have fallen as a result. In this case, a simple comparison over time would determine whether sales declined during the infringement period. Naturally, and as explained already above for other indicators, sales volumes may have changed for reasons not related to the infringement. In this context, the expert may consider undertaking a regression analysis to account for the influence of these other factors, otherwise a decrease in sales may be attributed wrongly to the pass-on of the overcharge.
422. If there is no data available to compare sales volumes over time, the expert may consider finding a suitable benchmark, either using data in another geographic market or relating to another product market. However, in this case even if the benchmark product is perfectly similar to the product in question but is sold in a different geographic market, there is no reason to consider that its sales volume would yield an accurate measure of the counterfactual level without further adjustments being made. This is because the size of the market or the market share of the benchmark product are unlikely to be similar to that of the product in question. To illustrate, consider the sugar example. Sales of the carbonated soft drink manufacturers in the affected market might be vastly different from those in unaffected markets if the former is larger than the latter, even if market shares are similar.

IV.B.5. The price elasticity of demand

423. Depending on which approach is selected to quantify the volume effect, the expert may have to obtain a measure of the price elasticity of demand for the product sold by the relevant purchaser. For instance, a measure of the elasticity is required to compute the volume effect using the Elasticity Approach or using the Discount Approach (see Verboven and van Dijk (2009)), in particular in the case of Bertrand competition with symmetric competitors.

424. The own price elasticity of demand measures how responsive consumer demand for a product is to changes in that product's own price only.¹⁹⁴ For example, if the relevant purchaser raises prices by 5% while its competitors do not, and the 'own price' elasticity for its products sold on the downstream market is estimated at -4, then if it sells 100 000 units before the price increase, its sales volume will fall by 20,000 units ($5\% \times (-4) \times 100,000 = -20,000$).
425. Clearly the magnitude of the 'own-price' volume effect depends on the extent to which consumer demand responds to a change in the product's own price. **All else being equal, the more elastic is that demand, the greater will be the volume effect.** Consider the above example. A price elasticity of -4 means that a 5% price rise gives a 20% reduction in sales volume. Instead, if consumers are not as responsive to price changes (the firm faces a relatively inelastic demand), the output effect will be smaller. If the price elasticity is just -1.5, for example, a 5% price rise will cause sales to fall by 7.5%.
426. As indicated in [Section IV.A.4.2](#), the extent of the volume effect will also depend on the changes in competitors' prices. Demand for the affected firm's products will increase if its rivals increase their prices too (e.g. in response to the overcharge itself or other firms' responses to the overcharge). In this case, the relevant cross-price elasticities can be used to estimate the magnitudes of "feedback" effects on the affected firm's volume that result from competitors changing their price. The cross-price elasticity measures, in percentage terms, by how much demand for one product changes in response to a 1% increase in the price of another, holding all other prices constant. To illustrate, if the cross-price elasticity with respect to a particular rival's price is 0.5, a 5% increase in that price will give rise to a 2.5% ($0.5 \times 5\%$) expansion in relevant demand.
427. These cross-price elasticities can be used to construct diversion ratios, which provide a measure of the closeness of competition between the affected purchaser and its rivals. When competitors only offer distant substitutes for each other's products, diversion ratios will be low (indicating that a low proportion of lost sales that result from a price increase will benefit rivals), suggesting that competitors' responses are unlikely to be significant either. Conversely, if diversion ratios are relatively high, this indicates that rivals' products are relatively close substitutes and, in this case, competitor responses might be significant. If the product of the affected firm is a close substitute to that of its rivals, the "feedback" effect will be significant, while it might be negligible if it is a distant substitute.
428. There are different ways to obtain the relevant price elasticity of demand for use in this approach. In [Annex F](#) we provide a brief introduction to the principal

¹⁹⁴ See EC Practical Guide at paragraph 130.

approaches that can be deployed to estimate the relevant price elasticity of demand. A detailed account of some of these techniques, in particular econometric analysis, is beyond the scope of this Study. (However, we provide some references in [Annex F](#)).

429. Note that in principle an individual firm would always face an elastic demand for its product, holding all other prices constant, casting doubt on any own-price elasticity measure that indicates that such demand is inelastic. This is because any firm (and, thus, the relevant purchaser) sets price on the portion of the demand curve that is elastic, otherwise they could always raise prices to gain more profit.¹⁹⁵ However, this does not apply to total market demand; that is, aggregate demand for all products in a market may well be inelastic.
430. Finally, it is important to note that the elasticity of demand may vary with the price level. That is, as shown above, in theory, as the price goes up demand may become more or less elastic, depending on the curvature of the inverse demand function.¹⁹⁶ Indeed, even if demand is assumed to be linear, which means that the relationship between price and quantity demanded is represented by a straight line, demand nevertheless becomes more elastic as prices increase. More generally, unless the inverse demand curve is very convex (i.e. more convex than isoelastic demand), then as price goes up, the price elasticity also increases.¹⁹⁷
431. The critical issue arises when the expert uses a point estimate for the elasticity to predict the loss of volume sold, ignoring therefore that the price elasticity varies as price changes. Specifically, if the elasticity of demand is estimated at observed price levels during the period of infringement, and if demand is not too convex, the volume effect is likely to be overstated. On the other hand, as

¹⁹⁵ A firm that is profit maximising would be expected always to select price at a point where customers' demand is elastic. At price levels at which demand is inelastic, the firm could always profitably raise price. This is because the profit gain from increase margin would outweigh the profit loss stemming from a reduction in volume sales. Therefore the range of prices for which demand is inelastic cannot be profit maximising. In other words, the price elasticity cannot, in absolute value, be less than 1.

¹⁹⁶ See [Annex D](#).

¹⁹⁷ The expert may be able to gauge whether the demand curve is very convex by using the formula provided by Bulow and Pfleiderer (1983) for the pass-on rate of single-product monopoly. The rate depends on the elasticity of demand, and the super-elasticity of demand η as follows: $\tau = \frac{dp}{dc} = \frac{\varepsilon}{\varepsilon - 1 + \eta}$.

The super-elasticity of demand indicates simply the extent to which the price elasticity increases (in absolute value) as the price level is elevated. This measure is thus useful to determine whether the elasticity increases or decreases as price goes up. The key insight is that using this formula shows that the pass-on rate can provide an indication, through the device of super-elasticity, about whether demand becomes more or less elastic as price is increased. Indeed, it can be seen that when η is greater (or less than) 1, then the pass-on rate is less than (greater than) 100%. When the pass-on rate is less than 100%, this implies that demand becomes more elastic as price goes up. In practical terms, this suggests that if the elasticity of demand is estimated at a price level that is higher than that of the counterfactual price, the output effect would be over-estimated. This is because the elasticity estimate used by the expert is too high. When the pass-on rate is greater than 100%, the opposite conclusion applies. That is, the elasticity estimate is too low, and thereby the expert under-states the output effect.

indicated in [Section IV.A.4.2](#) if the expert uses an estimate of the elasticity at the counterfactual price level, this point estimate is likely to under-state the volume lost (again, if demand is not too convex). Using these two elasticity point estimates (at the observed price level and at the counterfactual level), the expert may be able to establish an upper and a lower bound on the magnitude of the lost volume.

IV.B.6. When the curvature of demand matters

432. When using the simulation approach, the expert will have to approximate consumer behaviour with a demand function, thereby often fixing the curvature of demand. Recall that in imperfect competition settings, the pass-on of an overcharge will also depend on the curvature of demand, i.e. the way that the slope or elasticity of demand changes as price changes.¹⁹⁸ (See [Section III.B.5.1](#) where it is explained that in oligopolistic settings **the pass-on rate also depends on the curvature of the demand curve.**) Fixing the curvature of the demand curve *a priori* can be viewed as a serious drawback of the simulation approach. In the standard demand models used in the industrial organisation literature (such as linear, multinomial logit or Almost Ideal Demand System), **the curvature of demand is fixed by the assumed functional form, which also** determines the pass-on rate.
433. By way of illustration, if for simplicity the expert assumes a linear demand function to approximate consumer behaviour, this will imply that the pass-on rate is always the same regardless of the size of the change in marginal cost. In addition, with a linear demand the pass-on rate will be bound between $\frac{1}{2}$ and 1. Its exact value will depend on the number of firms and/or the extent of product differentiation. There is no reason, however, to assume *a priori* that demand is linear.
434. In contrast, in the random coefficient logit model, which is the model used by Kim and Cotterill (2008), the curvature of demand depends on observed product characteristics and the distribution of consumer characteristics, allowing the shape of demand curvature to vary for each product. Unlike other more restrictive models, in principle this demand model allows for heterogeneous consumer responses to price changes. That is, the elasticity of demand of a given product will depend on the types of consumers who purchase the said product. Hence, the price elasticity of that product is a weighted average of individual consumer's price sensitivities. When the price of the said product is

¹⁹⁸ In his *Principles of Economics* (1890), Alfred Marshall observed that the elasticity of demand may vary as price changes. Specifically, he suggested that the elasticity would increase (decrease) as price increased (decreased). The rate at which elasticity changes, which is captured by the curvature of demand, affects the rate of pass-on in imperfect competition settings. This implies that the inverse demand curve must not be too convex for the elasticity to increase with price.

increased, some consumers will no longer purchase it, which means that the composition of the group of consumers purchasing the product in question can vary with price changes. In other words, as the price goes up, in aggregate, consumer price sensitivities also change (thus the price elasticity for the product is also altered).

435. Consumer heterogeneity, however, may be introduced in several ways. For example, consumer sensitivity to price change may depend on income level. In most studies, higher income consumers tend to be less price sensitive. This implies that products that are purchased more by higher income consumers tend to have a less elastic demand than others.
436. When the price of a product is increased, the composition of the group of consumers buying the product will be altered, and the elasticity of demand may change. For instance, following a price rise, price-sensitive consumers may 'drop out' first, which means that in aggregate consumer demand for the product in question will comprise a greater proportion of higher income consumers, and thus its demand will become less elastic as prices go up. In this case, inverse demand will be convex, and this gives rise to a higher pass-on rate (See [Annex D.1.4](#)).
437. To be complete we also note that experts may consider using non-parametric techniques to estimate how different consumer groups react to price changes. For example, Blundell, Horowitz and Parey (2013) employ these techniques to assess whether US consumers who belong to the upper income, middle income or lower income groups react differently to an increase in the price of gasoline. Although this approach is quite flexible (expert do not impose any functional form on consumer demand), these techniques are demanding in terms of data and computing power.
438. The example provided above may however be demanding in terms of data requirements and also technically challenging. In principle, the expert will have to obtain data on price and sales of all competing products (see the example of Kim and Cotterill (2008) above, **Box 28**). Alternatively, the expert may contemplate using a simpler demand model whose parameters could be calibrated on the basis of market shares. However, in that case, the pass-on would depend critically on the shape of the assumed function, thereby conditioning the results. Care should be taken, because the choice of functional form for the demand equation is often arbitrary and the parties may have incentives to select a functional form that favours their position as to the passing-on effect.

IV.C. Issues with Data Collection

IV.C.1. The data challenge

439. The availability of suitable data is a key challenge to undertake the kind of empirical analysis described above. This will be an issue, in particular, where (absent a disclosure exercise) an expert may not have access to information in respect of other firms' costs and prices, especially where those firms are not parties to the relevant damages actions.¹⁹⁹

440. We note, in particular, that much of the data necessary to quantify the pass-on effect and the volume effect empirically may be held by the counter party or third parties to the litigation; For example, it will be the claimant who holds information relevant to whether and to what extent it passed on overcharges downstream, which the defendant may need to see to prove the pass-on defence; or it will be a third party that holds information relevant to upstream pass-on which an indirect purchaser and/or defendant may need to see to establish the extent of upstream pass-on to the indirect purchaser.

441. The ordering of access to data (disclosure) is a court-led process, which is subject to legal rules and procedures. Courts will, in accordance with the Directive, require that there exists a sufficiently plausible justification for ordering disclosure (i.e. that pass-on has occurred), and will consider questions of reasonableness and proportionality in the scope of any disclosure order.

442. Collecting data can be costly, as is the process of treating the data and deploying robust statistical and econometric techniques. It is therefore important to weigh the benefit of quantifying the passing-on and output effects against the cost that this process entails. For further details and guidance in relation to the process of disclosure see [Section V.C](#) below.

IV.C.2. Issues in the data collection process

443. To quantify directly the passing-on and the volume effects, an expert will have, at a minimum, to collect data for the following variables (we assume, for these purposes, that we are concerned with assessing the downstream pass-on of a particular claimant):

¹⁹⁹ This is one of the key differences between litigation in this area in the EU and the US. In the US, significant discovery occurs between as a matter of course pre-trial and pre-class certification. Furthermore, all parties have subpoena powers to obtain data or information from individuals, corporations or other entities who are not parties to a lawsuit.

Quantification of the passing-on and volume effects

- the claimant's prices in the downstream market;
- the claimant's unit volume sales in the downstream market; and
- the price the claimant paid for the input in question.

444. In general, for the last decade or so, companies have recorded data electronically on revenues and volumes sold. Typically, this data is used to produce internal management reports to evaluate business performance and external reports for accountants and investors to monitor the firm's financial health. Depending on the firm's practice, these reports may be produced on a monthly, quarterly or annual basis, and include information on sales values, volumes and costs at an aggregated level. They may also include key performance indicators such as profit margins. These reports can therefore offer a relatively straightforward source of information for profit margins or average prices in a before/after analysis.

445. Consider for example a single product firm that may have paid too much for a major input over a period of several years. In this case, data on the firm's profit margin may be used to estimate the pass-on effect using a before/after method (according to the Direct Approach outlined in [Section IV.A.3.1](#) above). That is, the profit margin outside the infringement period may be used as a benchmark and compared with the profit margin during the infringement period. Once the difference in margins has been estimated, data on volumes sold can be used to quantify the pass-on effect.

446. There are, however, a number of situations where the information provided in high level reports will be insufficient for a proper assessment. This may be because the basis for the reported information includes products or countries that were not part of the infringement. For instance, it may not be possible to separate revenues from products affected by the infringement from revenues from unaffected products.

447. To illustrate the issue, consider a single product firm that has multiple plants across different countries, and only a subset of the production units was affected by a cartel infringement. This could be because the geographic scope of the cartel was limited, and thus only plants in the location where the price-fixing agreement was implemented were affected in terms of the production cost. Therefore, in this scenario, where such differences are relevant and cannot be appropriately adjusted, using aggregate data at the firm level may mask certain trends and not be appropriate for estimating cost pass-on. Instead, it would be important to collect data at the plant level.

448. Alternatively, suppose that only a subset of the products manufactured by a multiproduct firm relied on the cartelised input. Similarly, access to relevant data for the product whose inputs have been impacted by the cartel would be critical.
449. In the rest of this section, we focus in particular on the relevant data that can be collected to estimate the pass-on effect and the output effect. To this end, the price that the direct purchasers charge to their own customers is a key variable (sales data, together with related volumes) as well as marginal cost (or variable cost).

IV.C.3. The price and volume measures

450. In general, the expert will try to obtain a measure of the realised price and of the volumes that the relevant purchaser (in our example above, the claimant) charged to its own customers for the products or services affected by the overcharge. To this end, the expert will typically use sales figures and volumes sold, and not list prices. This is because list prices do not include discounts, rebates and the effect of other promotional tools that the direct customers may employ. Hence the average price will be the result of dividing sales (revenue) by volume.
451. The volume is relatively more straightforward to measure, nonetheless it may also be subject to qualifications where the product can be measured over multiple dimensions (e.g. a fluid can be measured in number of bottles and also in terms of litres).
452. Typically, revenue or sales data will be available. To obtain a measure of average price per product, it is possible to divide the revenues by the corresponding volume. However, when the revenues include sales over several products, which might be sold at different prices, the calculation should provide a weighted average price of these different products. The weight in such a case will be determined by the volumes sold, e.g. the price of a product that sold more volumes will carry more weight than the price of a product with fewer volumes.
453. This average price may be affected by how sales and volume are recorded. It is imperative, before using these two variables, that the expert has a good understanding of how this data is recorded. The value (revenue and price) and volume data are generally stored in different ways. Firms will generally maintain a record of their transactions. However, multiple software solutions are used both to record, and retrieve, this type of information. As a general rule, most firms are not interested in their historic sales data, and may not have tools readily in place to extract data that is relevant for the analysis of the

infringement. It is advisable that all data provided to the expert should be accompanied by an appropriate narrative explaining how the data was recorded and how it was retrieved.

454. The following questions may typically need to be addressed in assessing sales value (price) data:

- Is sales data recorded at the list price level (i.e. gross sales), or does it include invoice discounts (i.e. net sales), or include year-end discounts (i.e. net sales)? Depending on the frequency of the data, it may not include year-end rebate or volume discounts; for example, monthly sales data may account for the year-end rebate only in December.
- Does sales data include transport costs that may be charged to the customer, or credit notes which give the customer specific rebates or discounts?

455. With regard to sales volume data, the issue that typically may arise is that the data can be recorded using different units of measurement, such that it is not possible to combine the data. It might be possible to convert to one common unit of measurement using some formula that applies to the product at issue. For example, one cubic meter of solid waste corresponds to a certain number of kilograms. Using this formula may help convert some of the volume recorded in cubic meters to kilograms, which can then be combined with the rest of the output in kilograms to compute the average price of solid waste. In some cases, there might not be any formula available. The expert may then consider using a price per cubic meter and a price in kilograms separately.

IV.C.4. The cost measure

456. To estimate the purchaser cost pass-on rate, the expert variously uses data on the price of the input in question, data on the price of other inputs or on marginal cost. For instance, equipped with data on price and marginal cost, the expert may estimate pass-on rates using the econometric approach set out in [Section IV.B.1.3](#) above. However, because firms typically do not record marginal cost data as such, the expert will have to use other cost information to approximate marginal cost.²⁰⁰ We consider three approaches below.

457. The expert may consider using the price of the input in question. In principle, the quantification of damages involves the estimation of the cartel overcharge, which can provide a direct measure of the input cost increase incurred by the purchaser. Using data on the input price, it might be possible to estimate the

²⁰⁰ See [Section IV.B.1.1](#).

extent to which the cartel overcharge was passed on. In this case, the expert concentrates on the pass-on of a specific input cost, not on total marginal cost. To control for the potential confounding influence of other inputs on price, this approach however requires data on the price of these inputs, notably to perform a regression analysis.

458. Alternatively, the expert may consider using firm's accounting cost information. In practice, economists may use average variable cost as a surrogate for marginal cost, because it varies with output. However, this approach presents its own challenges.

- First, the **delineation between variable and fixed costs is not always clear in practice**, and need not correspond to accounting convention. Importantly, the time frame over which pricing is considered affects the categories of costs that should be considered. For example, the acquisition of aircraft, which may be viewed as fixed cost, may take a few months (through leasing), increasing the supply of air transport and thereby impacting prices in a relatively short time frame in the relevant market. On the other hand, building a cement plant might take a few years, and thus affects output only in the mid- to long-term, with no immediate effect on prices. In this context, in order to evaluate the likely impact of cost changes on pricing behaviour, it might be useful to focus on avoidable costs, which correspond to the cost items that have been saved as a result of the output contraction associated with the pass-on. That is, if the purchaser suffers a reduction in output of 10 units, selling only 90 units as a result of passing-on some of the overcharge when, absent the infringement, 100 units would have been sold. This reduction in output will have saved the purchaser the costs associated with producing those units.
- Second, with multi-product firms, **the allocation of common costs is not always straightforward**²⁰¹. Firms have both direct and indirect costs. Direct costs can be traced directly to a specific product or service, and as such may be available at a granular level (e.g. by product). However, there might be indirect variable costs (such as indirect materials or electricity), and these cannot be traced to a specific product because they are common to multiple products. In such cases, the analyst must collect all relevant cost information and design allocation rules to address indirect variable costs - and such rules should be made explicit in the analysis.

459. To derive a measure of marginal cost without debating the exact definition of variable (or avoidable cost), the expert may contemplate estimating the relationship between total cost and output (through a cost function) to recover

²⁰¹ See [Section IV.B.3.1](#).

a measure of marginal cost, which is given by the measured impact of an additional unit of output on total cost. To this end, experts will have to use data on total cost (typically including both fixed and variable costs) and total units sold. For instance, Koetter et al. (2012) estimate a cost function to recover margin cost in the banking sector. While this strategy might be feasible if sufficient data is available, standard estimation techniques require assuming a particular functional form for the cost equations.²⁰² Such assumptions may lead to biased estimates of marginal cost. Using data in the electricity market in California, Delis et al. (2014)²⁰³ show that the standard techniques using commonly assumed cost function do not provide a measure of marginal costs that is as precise as more flexible estimation techniques (such as non (or semi) parametric techniques). Further exploration on a panel of simulated data, Delis et al. show that non-parametric methods in particular yield unbiased measure of marginal cost.²⁰⁴

IV.C.5. Steps to collecting firm level data

460. Data collection may involve experts requesting significant amounts of data from parties to litigation. As noted, where this involves data from an opposing party or a third party, this process will have to adhere to legal rules and court procedural requirements.²⁰⁵

461. We present practical steps below that experts may consider following to make data collection as efficient as possible. In some situations, experts will require a substantial amount of data, which could put an important burden on the firm that has to produce the information, and it is therefore recommended that experts provide a targeted request for information, avoiding the production of data that is not relevant. In each step, it is also advisable to set deadlines for the response to requests. These steps can usefully be employed and are applied in practice by courts as points of reference and as methods for managing such *inter partes* disclosure processes involving party or court-appointed experts.²⁰⁶

1. Developing an empirical strategy

462. Before requesting any data, the expert must determine which approach he or she plans to use to estimate the pass-on effect and the output effect. To this

²⁰² Many studies assume that the cost function is either log-linear or translog.

²⁰³ They use data about the electricity market in California. The major advantage of that industry is that data about the true marginal cost is easy to obtain. Therefore, it is possible to compare estimations with true values.

²⁰⁴ Delis et al. employ the semiparametric smooth coefficient model of Fran (1992), the generalised additive model of Hastie and Tibshirani (1986) and the nonparametric inefficiency model of Kumbhakar et al. (2007). Using simulated data, they show in particular that the generalised additive model is the most suitable method for estimating marginal cost.

²⁰⁵ For which, see further [Sections V.C](#) and [V.D](#) below.

²⁰⁶ See further, on this, [Section V.D.2](#) below.

end, the expert should gather the initially-available information, notably from witness statements, internal documents, marketing information and statements from industry experts, with a view to identifying an empirical strategy that is likely to yield reliable results. It would be inefficient to ask for data before the expert understands the key features of the industry at issue and the nature of competition. Such an understanding is critical to focus the data request. To this end, it might be useful that economic experts retained by the opposing parties come to an agreement on what might be the more appropriate approach in the case at hand, bearing in mind the time required and the cost of the data extraction process.

2. An initial request on database

463. Once the expert has set out a general road map, he or she can prepare an initial draft information request relating to sales, volume and cost information. The purpose of this first request is for the recipient to present an overview of the databases they maintain, including a relatively detailed account of the sales, volume and cost information that is contained in the databases and provide information about the level of aggregation at the business level (the hierarchy of the database, e.g. products/group of products/division or stores/regions/companies) or at the time level (e.g. yearly/quarterly/monthly).

3. A draft request of information

464. Upon analysing the response to the initial request, the expert will then draft a more detailed request to obtain the relevant data that is intended to be used. In an *inter partes* situation, the recipient's expert may provide comments and query the data request and, ideally, the two opposing experts would agree the request.

4. A data sample

465. Because data extraction may be a relatively intensive process, it can be useful if the recipient of the data request first provides a data sample. This allows experts to assess which variables would indeed be useful for their analysis and should be the focus of further collection.

5. Qs & As

466. Upon examining the data sample, the expert may consider sending a number of queries to clarify his or her understanding of the data. At that point, the recipient firm and the expert, and/or opposing experts, may engage in a dialogue to delineate the perimeter of the data request.

6. Final data request

467. Once satisfied as to the necessary and proportionate scope of the data request, the expert prepares a final data request, ideally in agreement with the opposing expert. Timing of delivery should be specified.

V. Guidance for judges on managing and assessing evidence related to pass-on

468. As has been seen in the previous sections of this Study, the evidencing of pass-on may often require complex economic assessment. This exercise can raise challenges for courts faced, *inter alia*, with evidence which can be difficult to understand due to lack of economic training on the part of judges, the difficulties explaining sophisticated analyses in such a way that non-experts can adequately understand and interpret them, and the particular problem of assessing contradictory findings by opposing experts that this poses.²⁰⁷ It is precisely for this reason that the Directive foresees the adoption of the Pass-on Guidelines, and this Study - in particular the description of quantification methods set out in the previous section - is intended to assist the Commission in their preparation.

469. At the same time, the judicial assessment of pass-on takes place within a specific national legal framework in which judges apply national rules on causation and standard of proof to the facts and evidence adduced, within the confines of national civil procedure and the rules and principles of EU law (such as, effectiveness, equivalence and the rules of the Directive on evidencing pass-on). Within these confines, the exercise of weighing up evidence is a fundamental privilege and competence of national courts and judges.

470. Mindful of these factors, this Study contains practical guidance to judges on how to approach procedural and evidentiary issues in the context of assessing economic evidence of pass-on. Accordingly, this section of the Study provides practical insight for national judges on questions of key relevance in carrying out their role in this area. Bearing in mind experience to date in the treatment of pass-on in competition litigation, we specifically address the following interlinked issues:

²⁰⁷ Professor Frédéric Jenny, then judge of the French Cour de Cassation, in his contribution to the "Workshop on the quantification of antitrust harm in actions for damages" (2010), suggested that the main sources of constraint for judges in order to properly assess complex economic theory or evidence were: "a) the difficulty for courts (or lawyers or economic experts) to find the appropriate economic tools to assess damages, or b) the difficulty experienced by courts when they must arbitrate between contradictory, but methodologically sophisticated and scientifically sound economic empirical assessments of harm, or c) the legal provisions or procedural constraints restricting the ability of courts to play an active role in the assessment of economic harm or from finding in accordance with sound economic reasoning", in Jenny, Frederic, 'A French Perspective on the Quantification of Antitrust Harm' (January 15, 2010), *Economist workshop on the quantification of antitrust harm in actions for damages* held by DG Competition on 26 January 2010, available at SSRN: <http://ssrn.com/abstract=2067017>.

- A. Causation and standard of proof: How to address causal uncertainty in the context of pass-on.
- B. Assessment of different types of evidence: How to assess different types of evidence of pass-on (factual and quantitative) and the role of economic theory.
- C. Disclosure: How to manage disclosure, ensuring compliance with principles of reasonableness and proportionality.
- D. Use of experts: How to deal with economic experts (party and court-appointed experts) and how to approach matters commonly arising in the context of case management, in the choice of methodologies and in the sharing of data.
- E. Parallel proceedings: How to manage parallel claims and take into consideration prior findings of pass-on.

471. Furthermore, in the next section, Section VI, we include a checklist for national courts which is intended to serve as a practical tool in its assessment of economic evidence of pass-on, building on the contents of this section and the rest of this Study.

V.A. Causation and standard of proof

How to address causal uncertainty in the context of pass-on

V.A.1. The challenge for courts

472. In claims for damages for breach of competition law, issues may typically arise about the causal link between the economic loss claimed and the infringement alleged to have caused that loss. This may particularly be the case where pass-on is invoked to allege that loss has been caused not directly to the direct purchaser but further down the supply chain (e.g., where an indirect purchaser alleges it has suffered overcharge harm as a result of upstream pass-on or where a defendant alleges the pass-on defence).²⁰⁸

²⁰⁸ Causation is not a central focus of this Study but, given its essential relevance to claims involving pass-on, it receives some brief attention here, with particular reference to the role of economics in evidencing causality. For further discussion on causation in this area, see in particular Lianos, Davis and Nebbia (2015), 'Damages Claims for the Infringement of EU Competition Law', Oxford University Press, Chapters 4 and 5.

473. It may often be difficult in practice to demonstrate that an increase of prices by a particular person or firm was due to an overcharge being passed on (or at least to what extent it was due to such pass-on), as opposed to being caused by other circumstances. Uncertainty as to whether a sufficient causal link exists may arise because of the factual complexity of concurrent causes of price variation, particularly where the interactions between various levels of the supply chain are in issue.

474. National courts may also find, on the facts of any particular case, that the loss being claimed is too remote, or that the infringement is not a sufficient or adequate cause of the harm, for the loss to be recoverable as a matter of law.

V.A.2. The legal test of causation and standard of proof

475. Causation in law, indeed, refers both to: (i) the factual link between the infringement and the damage (factual or material causation); and (ii) the delimitation of what constitutes recoverable loss and damage (legal causation). Legal causation may cover issues such as how far an infringer's liability extends as a matter of law (for instance, questions of proximity or remoteness, or recoverable harm) as well as what constitutes an adequate or sufficiently direct cause to generate (or reduce) liability.²⁰⁹

476. The detailed rules governing causation are laid down by national law and, accordingly, the precise requirements of factual and legal causation are a matter for national courts applying the applicable law to the case. The application of such rules is, nevertheless, subject to the EU law principles of effectiveness and equivalence.²¹⁰ The principle of effectiveness requires that national courts apply causation rules in such a way as not to make practically impossible or excessively difficult the legitimate claims of affected parties.²¹¹

477. The standard of proof is also a matter for national law.²¹² In relation specifically to the pass-on defence, the Commission has stated that it should

²⁰⁹ For example, a case cited in English law as being of potential analogous relevance for pass-on is *Fulton Shipping Inc v. Globalia Business Travel SAU* [2014] EWHC 1547 (Comm) where it was held that, in order for a benefit to be taken into account in reducing the loss recoverable by the innocent party for a breach of contract, it is generally speaking necessary that the benefit be caused by the breach, it is not sufficient if the breach has provided merely the occasion or context for the innocent party to obtain the benefit.

²¹⁰ Judgment in *Kone and Others*, C-557/12, EU:C:2014:1317, paragraph 24; recital 11 of the Preamble and Article 3 of the Directive. Applying the principle of effectiveness in *Kone*, the CJEU held that "umbrella" damages (in relation to purchases from non-cartelists) could not be excluded as recoverable harm and established that the proper inquiry of the national court should be whether as a result of the alleged umbrella effects the cartel had contributed to the distortion of price formation mechanisms governing competitive markets (paragraph 33 of the judgment).

²¹¹ Article 4 of the Directive.

²¹² EC Practical Guide at paragraph 4; Regulation 1/2003 at paragraph 5 of the Preamble.

not be "lower than the standard to which the claimant has to prove the existence and the amount of his damage".²¹³

478. The Directive provides for certain rules as regards legal presumptions. Importantly, in particular circumstances, it can be presumed (subject to contrary evidence) that overcharges have been passed on to indirect purchasers.²¹⁴ On the other hand, when raised as a defence, no such presumption exists and the defendant is charged with the burden of proving the existence and extent of passing-on.²¹⁵

479. It should be added, in relation to the question of proof, that the measure of damages claimed in competition law infringement cases and the impact on those damages caused by pass-on will always extend to pure economic losses. The best that the law and courts can do in such cases is to estimate the amount of the loss that must be compensated and assess the sufficiency of the causal link. Accordingly, to the extent permitted, the interpretation of economic analysis of the existence and extent of pass-on may entail a certain probabilistic approach to proof, in preference to the application of hard-edge rules.²¹⁶ In the Directive, this is reflected in the requirement that courts be able to "estimate" pass-on.²¹⁷

V.A.3. Economics and causation

480. Economics has an important role to play in assisting national courts in assessing causation issues relating to the impact of pass-on on damages claims. Economic theory, described above in Section III, can provide useful insights into the way in which markets, firms and consumers are predicted to behave in certain circumstances and courts may resort to such insight for guidance on the plausible extent of passing-on and the assessment of other evidence. The empirical methods described in Section IV can provide valuable assistance to experts and judges in the detection and quantification of pass-on effects. For instance, a robust econometric analysis, which is able to control for the potential influence of a number of relevant confounding factors, may

²¹³ White Paper on damages actions for breach of the EC antitrust rules, 2 April 2008, COM(2008) 165 final ("**White Paper**") paragraph 214.

²¹⁴ The three conditions for the application of the presumption are set out in Article 14(2) of the Directive and require that the defendant has infringed competition law, that this has resulted in an overcharge to the direct purchaser and that the claimant is an indirect purchaser (as defined in the Directive) of the goods or services that were the object of the infringement.

²¹⁵ This is consistent with CJEU case-law, according to which courts cannot establish a presumption of pass-on in favour of defendants or charge claimants with the burden of proving that pass-on did not take place (see Section II.C above).

²¹⁶ Lord Hoffmann's famous dictum in *Home Department v. Rehman* [2003] 1 AC 153 is frequently cited in this context: "some things are inherently more likely than others. It would need more cogent evidence to satisfy one that the creature walking in Regent's Park was more likely than not to have been a lioness than to be satisfied to the same standard of probability that it was an Alsatian".

²¹⁷ Article 12(5) of the Directive. Note also, in this context, the 2013 Communication at paragraph 9.

be capable of isolating the effects of a competition infringement on prices and outputs and provide useful insight into causation. In some circumstances, notably where there is not enough data or the cost of assessment is disproportionate, less sophisticated methods may also be used.²¹⁸ Accordingly, quantitative economic analysis can offer valuable evidence in the assessment of passing-on effects.

481. At the same time, national courts will understand the need proactively to review and verify economic evidence, as with the review of any type of evidence. Economic models are, by nature, stylized representations of reality. The requirements in law as to proving loss and factual causation will normally entail verifying whether such evidence adequately demonstrates the reality of pass-on.²¹⁹ In the right circumstances, economic evidence may be central in courts addressing this issue. However, its use does not *per se* mean that the legal burden of proving causation will be met.²²⁰ Rather, it may offer (often highly valuable) evidence of factual causality. The Commission has noted, in this regard, that regression analysis, for instance, “*may in some instances be suggestive of a causal inference of one variable to another*” (our emphasis), provided however that “*this is consistent with a coherent economic framework and with other pieces of qualitative and quantitative evidence*”.²²¹

482. Bearing in mind the foregoing, robust economic analysis should be based on sound theoretical principles and the assumptions used consistent with the features of the industry and the relevant facts of the case at hand. Courts should understand the assumptions used by each economic expert in their analyses and assess their plausibility against other facts and evidence adduced, notably in relation to how prices are in fact formed in the market or by the party in question. Importantly, courts should have regard for the sensitivity of the results of each expert report to particular assumptions being made – notably, in the present context, the impact they have on the pass-on effect and the quantum of damages. Further, quantitative assessment, in particular econometrics, requires accurate and sufficient data, and courts will need to be alive to testing what data has been used and

²¹⁸ See the 2013 Communication at paragraph 13, which states, *inter alia*: “Depending on the legal rules applicable and on the specific features of each case, it may [...] well be sufficient for the parties to provide facts and evidence on the damages quantum which are less detailed than those required by some of the methods and techniques mentioned in the practical guide.”.

²¹⁹ In US class action litigation courts refer to “bridging the gap between theory and reality”. See, for example, *A&M Supply v. Microsoft Corp.*: “[t]hrough the real world often validates economic theories and analysis, they represent evidence that courts and juries may have a difficult time accepting as proof. This is not to say that courts and juries are unable to understand economic theories and analysis, but that they can appreciate that there is a distance between theory and reality, and that the actual damages requirement in [the law] mandates proof of pass-on reality” (our emphasis).

²²⁰ See for a discussion of the interplay between concepts of causation in economics and law: Lianos, Davis and Nebbia (2015), *op. cit.*, Chapters 4 and 5.

²²¹ EC Practical Guide, paragraph 70.

how individual experts have constructed their models and reached their results.

483. As a final note, in preparing and evaluating economic evidence in the context of a civil damages action, courts and experts may need to take into consideration the demands of specific evidentiary rules - for example, on the use of presumptions of fact to infer causal relationships - which may apply in some jurisdictions.²²²

V.B. Types of evidence

How to assess different types of evidence of pass-on (factual and quantitative) and the role of economic theory

V.B.1. The holistic approach of courts to evidence of pass-on

484. Courts should consider all types of evidence in assessing complex economic issues of pass-on, including evidence derived from a qualitative appreciation of the facts (**qualitative evidence**) as well as evidence deriving from a quantitative analysis (**quantitative evidence**).²²³

²²² By way of illustration, note Article 386 of the Spanish Civil Procedural Code on judicial presumptions, Article 1353 of the French Civil Code on factual presumptions, or the concept of presumptions of fact in English law (see 'Phipson on Evidence', 6-17); which should be contrasted with legal presumptions, such as those established in the Directive. Note, in the context of factual presumptions, the use of aggregated data in economic models to draw more particular causal inferences (see, for example, [Section IV.B.1.1](#) above). See on this point more generally: Lianos, Davis and Nebbia (2015) at page 74: "*Causation is certainly the area of tort law raising the most difficult and interesting questions as to the integration of the methods of economics, in view of the combination of empirical but also theoretical knowledge and assumptions, some of which are characterized by some relative uncertainty over the relevant actors' behaviour (firms, individuals) and more generally the operation of market processes, but which also rely on aggregate data and statistics to make inferences, rather than information on the effects of the specific transactions, which is often unavailable*". At the same time, the authors note that competition economics may influence the way in which consideration of the evidence of causation in tort law may develop: "*In view of the reliance of EU competition law on the doctrinal toolkit of general tort law, when envisaging damages for competition law infringements and the frequent use of economic evidence in competition litigation, competition law cases may exercise an important influence on the development of general tort law and the increasing consideration of scientific evidence on causation*".

²²³ The need to verify economic analysis against other types of evidence is recognized by DG Competition in its Best Practices for the submission of economic evidence and data collection in cases concerning the application of Articles 101 And 102 TFEU and in Merger Cases ("**Best Practices**"), paragraph 4, noting that "*one must assess the congruence and consistency of the economic analysis with other pieces of quantitative and qualitative evidence (such as customer responses, or documentary evidence)*". The General Court has also accepted that the regulator is entitled to assess all relevant available evidence including "technical" (e.g., regression analysis of prices) and "non-technical" evidence (judgment in *Ryanair v. Commission*, T-342/07, EU:T:2010:280, paragraph 136). This is also the normal practice of civil courts.

V.B.2. Qualitative evidence

485. To assess pass-on, experts and judges may rely on qualitative evidence to understand a company's approach to pricing and the reasons why prices may have varied over time. Qualitative evidence can include:

- a) Contractual documentation, including correspondence that establishes the way in which prices are set and revised costs are to be borne.
- b) Financial documentation, including accounting data and testimony from accounting experts as to how such data is accounted for by companies.
- c) Internal documents relating to costs and pricing of the relevant product(s), such as, for example, pricing strategy documents (including pricing models / methodology papers).
- d) Witness statements / testimony from the business people involved in the pricing of products about how prices are negotiated, set, formulated and / or modified, as well as relating to specific events which may have caused price changes over the relevant period of time.²²⁴
- e) In regulated industries, regulations and other related documentation relating to price setting, for example concerning price caps, price increases, cost orientation of products or services, etc.²²⁵
- f) Testimony of industry experts, in relation to the dynamics and operation of a particular market.²²⁶

486. Industry reports and/or academic articles may not be considered direct factual evidence by courts, but they may provide useful insight into broader trends in the market, may explore general price movements (i.e., beyond the cartel's influence on price) and may even address general cost pass-on rates.²²⁷ They may accordingly be considered by courts in conjunction with other evidence.

²²⁴ Such witness evidence was adduced in *Cooper Tire* (2010).

²²⁵ This issue was of central importance in the *National Grid* litigation, see [Section V.D.2](#) below.

²²⁶ The use of industry experts is now fairly common, for instance, in the US. Cases may involve retail experts, where the distribution chain is complex. Experts serve not only to educate the judge, but also to ensure that the economists' assumptions are correct.

²²⁷ See e.g., Leibtag, Nakamura, Nakamura and Zerom (2007); also 'The Biologic and Economic Assessment of Dimethoate', *Technical Bulletin*, No. 1663, US Department of Agriculture (1979), which was used by the judicially-appointed expert in *Cheminova* (2015) to assess the competitive conditions of the pesticides market.

487. General or anecdotal evidence of pass-on included in the decisions of competition authorities may also be considered by courts, although its evidentiary value should be critically reviewed in light of the object and scope of the administration's jurisdiction.²²⁸ Where this evidence has been informed by economic evidence produced during the administrative proceeding, this may in appropriate circumstances be taken into account.²²⁹
488. Expert economic analysis may also constitute a relevant category of qualitative evidence, where it is based on facts, witness statements, internal documents and even simple data analysis such as charts and correlation, rather than a formal quantitative analysis of data. Indeed, like any economic analysis or expert opinion, such analysis must be rigorous, and seek to support its predictions with robust evidence.

V.B.3. Quantitative evidence

489. **Quantitative analysis** refers to the use of economic analysis, which may be based on statistical and/or econometric techniques, to quantify the pass-on and output effects. Section IV of this Study provides an extensive overview of quantitative approaches that can be deployed for this purpose. This can, depending on circumstances and data availability, include both correlation analysis and more sophisticated multi-variable regression analysis.²³⁰

V.B.4. Role of economic theory

490. As explained above in Section III, economic theory can provide courts with insight for assessing the plausibility of passing-on arguments and support choices adopted by economists in their quantitative analyses. More generally, it can provide insight into the factors that are likely to affect the extent of passing-on in specific circumstances and may assist judges in making decisions in relation to the disclosure of data (or economic experts in their selection of data for constructing quantitative evidence). Economic theory may also provide a basis for discerning credibility and reliability in the case of competing economic explanations. Accordingly, economic theory can play an important role as a framework for courts' and experts' assessment

²²⁸ This was a point highlighted by the Spanish Supreme Court in *Spanish Sugar II* (2013). NCAs may make a general finding that a particular infringement has affected consumers in the context of fine setting or the finding of an infringement, but may not have carried out any detailed (let alone empirical) analysis of such relationship.

²²⁹ In such circumstances, courts may consider requesting the information from their corresponding NCA or from the European Commission (the latter pursuant to Article 15(1) of Regulation 1/2003).

²³⁰ Section IV.A.7 provides a summary and ranking of the various methods considered in this Study, subject to available evidence and proportionality considerations.

of evidence of pass-on, provided always that the theory relied upon is consistent with the facts of the case at hand.

V.B.5. Insight into process

491. Subject to the possibilities offered by national procedures, courts may find it useful in approaching the consideration of the different types of evidence related to pass-on to consider the taxonomy set out in **Figure 18** below. These different categories are not necessarily collected in chronological order and the introduction of different evidentiary components to proceedings will depend on how and when evidence is to be proffered pursuant to national procedural rules. For example, where pass-on is a relevant or material factor for claims, economists may be involved by courts early on in order to assist in identifying relevant issues and information for the analysis, or because reports are required to be submitted with initial pleadings.

Figure 18: Taxonomy of pass-on evidence

PRIOR CONTEXT	FACTUAL EVIDENCE	ECONOMICS
•Existing Court decisions on pass-on •NCA Decisions with statements on market dynamics •Market studies	•Contracts •Internal documents on strategy, pricing etc. •Financial reporting •Witness statements •Regulation	•Insights from economic reasoning •Identification of relevant evidence to support or reject theoretical predictions (evidence can be qualitative or quantitative) •Testing predictions with both qualitative and quantitative evidence •Drawing inferences from available data.

492. **Prior context.** It is useful for courts to consider contextual materials which may indicate the plausibility of pass-on in a particular case and influence the court’s approach to the evidentiary assessment of the issue (for example, whether the defence should be entertained, what level of disclosure is appropriate, etc.). Importantly, this prior context may include rulings of parallel civil proceedings at the same or different levels of the supply chain in the same market. Application of economic reasoning will also likely form

part of this threshold consideration of pass-on, offering insight into the plausibility and likely nature of pass-on in the circumstances of a particular market or markets. All of this type of evidence can normally be proffered early on in proceedings.

493. **Factual evidence.** This will start with parties collating and analysing available contemporaneous documents, to see if there is any record or evidence of a link between the downstream pricing and the upstream overcharge that results from the infringement. There may also be corporate pricing policies or sophisticated algorithms in play which can be adduced in evidence. Where documentation is limited or inconclusive, the best available direct evidence will be the witness statements and testimony of the parties on how prices were set, and this will, in all events, be helpful in clarifying other complex evidence. Regulation may also have a role to play in price setting. This evidentiary stage may involve in-depth fact finding and examination at trial.

494. **Economics.** Economists may be involved from an early stage of proceedings in order to provide qualitative insight into, and assessment of, pass-on based on theory, market conditions²³¹ and other evidence. They will then also influence the collection of (and request for) relevant data and information to evaluate the extent of passing-on, including testing theoretical predictions, and where appropriate develop quantitative analysis. Economic expert reports may be proffered earlier or later in proceedings, depending on the particularities of national procedure. The testimony of expert economists will be provided and tested at trial, alongside the rest of the evidence adduced before the court.

V.C. Disclosure

How to manage disclosure, ensuring compliance with principles of reasonableness and proportionality

495. Access to adequate data and information in the hands of opposing parties or third parties to litigation can be important in carrying out meaningful economic analysis of pass-on. The provisions and scope of national disclosure regimes, introduced as a result of the Directive, and the manner in which those provisions are applied by national courts, will therefore be of relevance.

²³¹ Market conditions could include factors such as input costs, competition benchmarking, frequency of contractual negotiations, character of trading relationships, whether the cost increase was experienced by all market participants or only a subset, the degree of buyer power, and pricing models.

V.C.1. Reasonableness and proportionality

496. The principles of reasonableness and proportionality are included in the conditions for disclosure established by the Directive.²³² These principles help to frame questions concerning, for example, whether disclosure in relation to pass-on is justifiable and, if so, the extent of the disclosure required for a given method of economic analysis of pass-on.²³³
497. Factors such as the availability, volume and cost of retrieval (and possibly cleaning) of data must be taken into account when assessing the utility and scope of quantitative analysis of pass-on. Before any steps are taken and throughout the disclosure stages of any proceedings, there is a balancing process to be achieved between obtaining accuracy and ensuring that what is proposed is both reasonable and proportionate to the claim.²³⁴
498. There may potentially be vast amounts of information available to parties, particularly given the length of some infringements, the number of parties involved and the proliferation of electronic information over recent decades. Historical data, which is generally of limited use for companies, may not be stored electronically but only in voluminous paper documentation, or it may be stored on old legacy systems, all of which hinder and increase the cost of disclosure. By contrast, where data is centrally stored electronically in modern systems and can be easily accessed, e-disclosure may not necessarily be unreasonable or disproportionate.
499. Real concerns about ensuring the reasonableness and proportionality of disclosure exercises in competition litigation have arisen in cases in England and Wales.²³⁵ The *Air Cargo* litigation in London is a case in point (see **Box 38**).

²³² Articles 5, 13 and 14.1 of the Directive. In the EC Practical Guide, it is noted (paragraph 8) that relevant considerations in assessing possible quantification methods or techniques include whether sufficient data is available and whether the burden and costs involved are proportionate to the value of the claim.

²³³ Article 5(2) of the Directive provides that parties requesting disclosure should present a reasoned justification based on reasonably available facts and Article 5(3) requires disclosure to be limited to what is proportionate. More generally, Article 5(1) provides for disclosure from parties or third parties on the basis of "a reasoned justification containing reasonably available facts and evidence to support the plausibility of its claim for damages".

²³⁴ Friederiszick and Röller (2010), where the authors refer to this balance as the "trade-off between accuracy and practicality" and argue that such trade-offs not only need to be well understood and made transparent but that "decisions on how to proceed in light of those trade-offs have to be taken upfront by the court."

²³⁵ Reasonableness and proportionality form part of the principles set out in the English procedural rules on the use of disclosure of documents and expert evidence, see, in particular, Parts 1, 31 and 35 CPR; also 'Guidance on Instructions to Experts' (Civil Justice Council, August 2014).

Box 38: UK Air Cargo

High Court of England & Wales, *Emerald Supplies v. British Airways Plc*, HC-2008-000002

This case, concerning follow-on claims for damages arising from the European Commission's 2010 decision in relation to the Air Cargo Cartel, is one of the largest cartel damages actions to date in Europe. Parallel actions have been brought in the Netherlands and Germany.

Emerald brought a representative action on behalf of 565 parties claiming loss as a result of an alleged price-fixing cartel in the market for the supply of air freight services, to which Emerald alleged that British Airways had been party. The claim was brought before the conclusion of the European Commission's investigation. The European Commission subsequently found British Airways and other airlines guilty of breaching Article 101 TFEU (although the General Court then overturned this decision in its judgment of 16 December 2015).

Each "side" has instructed its own expert, each of whom has proposed his own distinct method for estimating pass-on. The claimants' expert (an accountant) has proposed an approach based on the review of the sales prices and costs of the claimant groups during the cartel period. Conversely, the expert for the defendants (an economist) is of the view that only detailed regression analysis can isolate the relevant variables and accurately plot pass-on. The expert for the claimants contends that a detailed regression analysis would not give meaningful results because the air cargo costs are such a small input in the aggregate costs of the claimants (i.e. the small air cargo costs would, effectively, be "lost" in the data set).

While both approaches require the disclosure of information about pricing and costs, the approach of the defendants' experts is likely to result in a materially larger volume of data, being based on every relevant transaction by every claimant – albeit this may in practice be partially remedied where information is electronically stored and accessible in appropriate formats.

No disclosure of documents in relation to pass-on has been made to date, but at a case management conference in October 2015, the judge expressed acute concern about the potential complexity of the expert evidence and the extent to which this would assist her in reaching a judgment on pass-on.

The judge has requested that the parties' experts reach an agreement on the proposed approach to economic evidence before any disclosure is ordered. In so doing, the judge has given an early indication that she will control the disclosure process, with the parties being required both to justify the requests being made and to make efforts to find agreement on areas where their approaches differ regarding the estimation of pass-on. In the event that the experts fail to reach agreement, the judge will hear submissions on the respective approaches (including an explanation of what each expert proposes, the information they require for their analysis and the approximate cost of the exercise) to assess for herself which party is, in her view, correct and which method should be applied.

V.C.2. Confidentiality

500. Given that the estimation of pass-on is based on the analysis of, *inter alia*, companies' financial information and/or data, disclosure is likely to include documents, data and information that are commercially sensitive to the

parties. National courts must therefore be in a position to provide assurances to the parties regarding the confidential treatment of such information if a disclosure regime is to be workable and effective.

501. The Directive makes specific reference to the treatment of confidential information and provides recommendations as to possible measures courts may consider.²³⁶ These recommendations (which reflect similar proposals in the Commission's draft "Know-How Directive")²³⁷ include the following measures:

- Allowing for the redaction of sensitive passages within disclosed documents so as to create non-confidential versions of documents.
- Conducting *in camera* hearings or sessions, with access to any records or transcripts of such hearings either restricted to the parties or redacted in respect of confidential elements.
- Restricting the circle of people who are allowed to examine the evidence, including through the agreement and implementation of court-approved confidentiality rings and the use of restricted access data hosting sites.²³⁸
- Instructing economic experts to produce summaries of the confidential or commercially sensitive data in aggregated or otherwise non-confidential form.
- Ensuring that, where applicable, the court makes available a non-confidential version of any judicial decision, in which the passages containing trade secrets have been removed.

502. Finally, as noted at Recital 18 of the Directive, the protection of business secrets and other confidential information through the use of these measures should not impede the exercise of the right to compensation.

V.C.3. Judicial oversight

503. Judicial control of the disclosure process is important. Article 5(7) of the Directive, for instance, requires Member States to ensure that parties have an opportunity to be heard before the judge orders disclosure. Without

²³⁶ See Article 5(4) and Recital 18 of the Directive.

²³⁷ Proposal for a Directive of the European Parliament and of the Council on the protection of undisclosed know-how and business information (trade secrets) against their unlawful acquisition, use and disclosure COM(2013) 813 final, Article 8. Given that it is foreseeable that such measures may have to be implemented in the future, Member States may be minded to apply them directly as part of the implementation of the Directive. This has, for instance, been the proposal put forward by the Spanish administration in the initial draft proposal for implementation of the Directive.

²³⁸ See [Section V.D.4](#) below.

judicial control of the process, there arises the risk of vexatious disclosure requests (e.g. intended to cause delay and increase costs),²³⁹ on the one hand, and inadequate or insufficient disclosure, on the other, both of which could jeopardise the effectiveness of EU competition law.

504. The assessment of whether disclosure should be required and meets the demands of reasonableness and proportionality is an exercise requiring the input of the parties and the judge. Experts should also, where possible, be involved in order to assess the requirements for and viability of certain methods and to explain what they propose to achieve with certain data sets. Agreement between the parties and their experts may be possible and may be encouraged, notably on the choice of methods and the scope of data requests.²⁴⁰ In addition, pilot exercises, to gauge the viability of both methods and data, may be considered. For instance, experts may agree on a sample exercise concerning products, periods or geographic markets to be analysed.²⁴¹ Judicially-appointed experts may also assist in determining the scope of disclosure. Nevertheless, courts should maintain ultimate control of the disclosure process in order to ensure that the objectives of the Directive and of EU competition law are met, and cannot delegate this task entirely to party or judicially-appointed experts.

V.C.4. Recommendations

505. Subject to the constraints of national procedures, the following methods and mechanisms may be of value to judges in seeking to manage disclosure:

- a) **Threshold tests:** Before making any disclosure orders, the judge should be persuaded, on the basis of a reasoned justification containing reasonably available facts and evidence pertaining to the case at hand, that it is plausible that pass-on has occurred. Where justified, the scope of disclosure will be a matter for national judges to decide, being guided, *inter alia*, by the principles of reasonableness and proportionality.
- b) **Early written proposals:** It can be helpful to ask the parties (with input from experts) to provide an initial disclosure proposal, setting out

²³⁹ On the question of costs, Member States are free under the Directive to choose whether disclosure costs are: (i) borne by the disclosing party; or (ii) paid by the requesting party (as is currently proposed in Spain and applies, generally, to third party requests in England and Wales); or (iii) fully or partly recoverable by the winning party at the end of the proceeding (as for example in England and Wales). It may need to be considered to what extent costs burdens ensure the fair and equitable share of the onus of damages claims and, accordingly, the effectiveness of EU competition law.

²⁴⁰ See [Section V.D.2](#) below.

²⁴¹ For further discussion of inter-expert processes, see [Section IV.C.](#) See also [Section V.D.2](#) below on the management of expert evidence.

the scope of disclosure sought, the estimated cost of the process and the location and availability of the documents in the party's possession.²⁴² By obtaining this information early, the judge is able to form an idea of the time, work and costs involved. Judges can also seek justifications from the parties and their experts regarding their suggested approach, including why that information is proportionate to the exercise and to the ends sought. Additionally, written proposals can help flush out the areas of disagreement between the parties and narrow the scope of disclosure from the outset.

- c) **Staged disclosure:** Judges can control for excesses in disclosure by staging the process. This involves ordering disclosure in tranches (for example, a first stage covering documents on pricing policy and costs, followed, if appropriate and justified, by a second stage covering information on prices, and so on). Once the parties have received and analysed the documents and information in a first stage of disclosure, a decision can be made as to whether any further disclosure is, in fact, necessary and, if it is, enable the parties to further narrow subsequent disclosure requests.
- d) **Sampling:** When the disclosure of data might be overly time consuming and costly, it may be reasonable to consider estimating pass-on only for a sub-set of customers or products or periods or territories. For this approach to be valid, it must be the case that these sub-sets are sufficiently representative or that it be set up as only an initial exercise. Where this occurs, such exercises are normally the result of agreement between the parties and their experts, under the supervision of the judge.
- e) **Disclosure hearings:** Following agreement on the scope of disclosure, it is advisable for judges to seek to manage the process through the scheduling of hearings to address issues such as further requests, problems with disclosure provided and any trouble encountered by the parties in collating the data. This is particularly relevant in the event that the judge has ordered staged disclosure. Such hearings can be supplemented by meetings attended, as necessary, by the "opposing" experts aimed at resolving and narrowing any remaining differences in approach.

²⁴² This can either be in the form of a template court document (such as the Electronic Documents Questionnaire in England & Wales) or in a bespoke document requested by the judge.

V.D. Use of economic experts

How to deal with economic experts (party experts and court-appointed experts): case management, methodologies, sharing of data

V.D.1. Types and roles of economic experts in national systems

506. The economic assessment of pass-on regularly requires the use of economic experts in the legal process. It is in this area where one of the greatest differences can be found between national legal systems in the EU.

507. A number of important variations can be highlighted:

- Party vs. Court-appointed experts. Courts in Germany, the Netherlands, and the UK, and also France more recently, appear to be ready to deal directly and to favour confronting economic reports provided by the parties themselves.²⁴³ Courts in Belgium, Denmark, Hungary and Italy have sought to rely on court-appointed experts (in some cases in addition to party experts) to assist them in the analysis of economic questions. Practices otherwise vary between jurisdictions, according to the ability of judges to select true experts in the relevant field (sometimes based on a list of experts recommended by the parties) or subject to the constraints of court expert lists where true expertise is not ensured.
- Duties of experts. A key question is to whom the expert owes a duty. In English and Irish courts, the expert owes a duty to the court, even if their fees are initially paid by the instructing party. In some civil jurisdictions, like Spain, party experts have a duty of objectiveness and independence, however, in Germany and Italy there is no such express requirement. A judicially-appointed expert owes its duty to the court, even if generally the requesting party may be required to assume certain upfront fee payments. The question of to whom an expert owes his or her duty is clearly important as a factor in assessing the weight to be given to expert evidence.²⁴⁴
- Case management. Courts in Common Law jurisdictions have the ability actively to case manage expert evidence before it is produced (and to request preliminary reports, for example, to establish that a valid claim exists), whereas this is currently more remote for many civil processes where expert evidence may need to be tendered fairly early on or, in all events, with little or no prior guidance or direction from judges. Such an approach may be modified by the introduction of disclosure to Civil Law

²⁴³ This is also the case in the US.

²⁴⁴ In the US, the expert has a duty of impartiality but is nevertheless an advocate for the hiring side.

proceedings and the need for further hearings and stages to the process. More active court management can currently be seen in Civil Law jurisdictions if the court appoints an expert to review party evidence or to come up with his or her own findings and, accordingly, this mechanism may be important.

V.D.2. Managing the economic expert process

508. Given the potential complexity of the economic assessment of pass-on and the potential scope of information disclosure, it is essential that national courts apply national procedures in such a way as to manage the use of expert witness evidence with the objective of ensuring the twin related goals of: (i) the effectiveness of EU competition law; and (ii) just and proportionate proceedings. This means, for instance, that the judge should not delegate responsibility for decisions relating to how pass-on is assessed entirely to experts.
509. It is important that judges adequately understand what approach the experts propose to follow, including the assumptions being made, and what the approach entails in terms of information/data requirements as well as the costs and time involved. The court may ideally grant parties (and possibly experts) the chance to expound their approaches, their objectives and what the work will involve before taking a decision. It may be desirable for the judge to receive further guidance on proposed approaches. In practice, subject to the constraints of national procedure, this could involve: (i) the appointment of an independent expert (agreed by the parties) to tutor judges in the technical elements behind the proposed economic/econometric analysis; (ii) the parties producing a joint “primer” for the judge, which fulfils the same function; and (iii) court guidance (such as the future EC Pass-on Guidelines).
510. In the event that a court-appointed expert is chosen to manage the process on behalf of the judge, it is important that the court establishes conditions or “terms of reference” covering realistic timelines (based on the expert’s understanding of the task in hand) and the process for the production of expert economic evidence. Instructions should be provided by the judge to the expert and the parties on the process so that the judge maintains overall responsibility for and control of the process. These terms of reference should, ideally, be provided after a hearing on the subject of expert evidence so the parties have the opportunity to advance and exchange views on what should be covered in relation to pass-on (for example, how the parties are to address volume effects). These instructions should include clear and concise questions for the parties’ experts covering all of the issues in dispute.

Should there be any dispute about the process and the decisions taken by the court-appointed expert (for example, on the scope of disclosure), the parties should be allowed recourse to the judge to review such decisions.

511. A helpful tool is the use of discussions between experts, aimed at narrowing down areas of agreement and disagreement on issues relevant to the case (as well as related disclosure requirements). English Civil Procedure Rules allow the court to direct the taking place of discussions between experts in this way. The precise form of such discussions may vary according to what is proportionate and reasonable in the context of a particular case. Such discussions are without prejudice (and will not be referred to at trial) unless the parties otherwise agree.
512. The *UK Air Cargo* (**Box 38** above) and *National Grid* cases (**Box 39** below) serve as helpful examples.

Box 39: National Grid

National Grid Electricity Transmission Plc v. ABB Ltd and Others, HC08C03243.

This case concerned a follow-on damages claim by English power supplier National Grid against manufacturers of gas-insulated switchgear ("GIS") who had been found to have operated a cartel by the European Commission in its decision of 24 January 2007. The proceedings went almost to trial, when the parties reached a settlement, by which stage a significant amount of work had been carried out by economic experts.

Each party employed an economic expert (one for National Grid and one for each of the three defendants, Siemens, Alstom and ABB). The analysis of pass-on centred on economic modelling designed to reflect the regulatory environment in which National Grid operated.

There were two sources of information for the experts' work: (i) publicly available documents relating to the regulatory framework in which National Grid operated (accounting for approx. 90% of the information used); (ii) documents obtained from National Grid through the disclosure process (accounting for approx. 10% of the information used). The latter included internal documents relating to discussions with the regulator, material submitted by National Grid to the regulator and responses from the regulator.

In addition to documentary evidence, the parties employed witnesses of two types: (i) party employees who explained how the market worked and how pricing was set; and (ii) former employees of the regulator, who opined on the way in which National Grid's base pricing was set and the company's interactions with the regulator.

The experts agreed to produce respective reports and came up with a list of 150 economic issues in dispute in the case, some of which related to pass-on. After several rounds of extensive meetings involving all parties' experts, the experts succeeded in reducing the number of issues in dispute from 150 to 50. This permitted an agreed approach to the economic modelling and the remaining issues in dispute related to the treatment of certain items (e.g. asset base, allowance for capital expenditure) within each party's model.

V.D.3. Best practices for the submission of economic evidence

513. Best practices for the submission of economic evidence in the EU are not adapted to the particular setting of the court room assessing a private damages claim.²⁴⁵ Nevertheless, they set forth basic standards that the submission of a party expert should contain. They stress that the choice of any empirical or theoretical model, and any assumptions relied on, should be properly motivated and grounded in the facts of the case.²⁴⁶ It should, where possible, be consistent with the generally accepted scientific practice, robust,

²⁴⁵ Examples include the best practice documents of the UK Competition Commission (2009), of the German Bundeskartellamt (2010) and the European Commission itself (2010).

²⁴⁶ This is reflected in the recommendations in the Commission's Best Practices which state at paragraph 10: "Any economic model which explicitly or implicitly supports a theoretical claim must rely on assumptions that are consistent with the facts of the industry under consideration. These assumptions should be carefully laid out and the sensitivity of its predictions to changes to the assumptions should be made explicit".

and allow for replicability of results. It is further advised that, to the extent possible, the dataset should be complete, relevant and reliable.

514. Best practice also recommends including a robustness analysis to explore the reliability of the results of the economic analysis. For instance, if there is sufficient information, it is sensible to compare the results obtained from one approach with those from other approaches.
515. Moreover, when conducting empirical work, it is sensible to explore the sensitivity of estimates to the specific assumptions adopted and the quality of the data used. In particular, the expert may present the results of a so-called "sensitivity analysis". Such an analysis will consist of testing whether the results are sensitive to changes in the data used, the selected approach or the assumptions made. Such changes should be reasonable; for example, dropping half of the data to test whether the empirical analysis produces the same result is in principle not reasonable, unless this can be justified. On the other hand, it is relevant to establish whether the results depend on few data points. Similarly, often economic analysis rests on a set of simplifying assumptions, which may not match reality. This, in and of itself, should not necessarily discredit the analysis, in particular when market outcomes can be predicted by such an analysis. The critical issue is whether the results hinge on a particular assumption. If the outcome of the "sensitivity analysis" shows that indeed the results differ in important ways, this indicates a sensitivity to the assumption at issue, and may point to fundamental reliability issues with this particular analysis.
516. In England and Wales, the Civil Procedure Rules²⁴⁷ provide specific guidance as to the expectations for the contents of the expert evidence. Key requirements include:
- a) references to any materials relied on in drafting the report;
 - b) a statement setting out the substance of all facts and instructions which are material to the opinions expressed in the report or upon which those opinions are based;
 - c) an explanation of any assumptions taken into account in undertaking the analysis;
 - d) a list of the individuals who may have assisted in putting together the report, which part they assisted with and whether their work was supervised by the named expert; and

²⁴⁷ CPR 35.10 and the accompanying Practice Directions.

- e) a statement to the effect that the facts stated in the report are within the expert's own knowledge.

517. Such terms of reference and/or directions in relation to the conditions assist greatly in ensuring the reliability, verification and replicability of the expert evidence.

518. In the US, the Reference Manual on Scientific Evidence ("Reference Manual"), published by the Federal Judicial Center (a United States' agency) together with the National Research Council, is the leading reference source for judges confronted with complex scientific testimony.²⁴⁸

519. The first edition of the Reference Manual was published in 1994, soon after Federal Rule of Evidence 702²⁴⁹ was interpreted by the US Supreme Court in *Daubert v. Merrel Dow Pharmaceuticals, Inc.*²⁵⁰ In *Daubert* and its progeny,²⁵¹ the US Supreme Court recognized a gatekeeping role for district courts when deciding on the admissibility of expert testimony in trial. Thus, following the Rules of Evidence and *Daubert*, courts routinely make *a priori* exclusions of expert testimonies when they determine either that they are irrelevant, unreliable or would not be helpful to the "trier of fact" (i.e. the party seeking to determine or prove the fact). In analysing whether expert testimony is based on sufficient facts or data and is the product of reliable principles and methods, *Daubert* provides a list of non-exhaustive factors that courts may validly take into account. These are: (i) whether the theory or technique in question can be and has been tested; (ii) whether it has been subjected to peer review and publication; (iii) its known or potential error rate; (iv) the existence and maintenance of standards controlling its operation; and (v) whether it has attracted widespread acceptance within a relevant scientific community. *Daubert* motions to exclude expert testimony are considered both at the class certification and merits phases of the litigation, including summary judgement and *in limine*. Courts exclude expert opinions if they are not helpful to the trier of fact, based on unsupported assumptions or beliefs, or fail to address likely alternative explanations.

520. Most European procedures do not normally permit *a priori* controls on the legitimacy and admissibility of economic expert evidence since it is the judge

²⁴⁸ 'Reference Manual on Scientific Evidence' (3rd Edition, Washington, DC: National Academy Press, 2011), Federal Judicial Center and National Research Center.

²⁴⁹ Fed. R. Evid. 702 requires that an expert's testimony (a) "help the trier of fact to understand the evidence or to determine a fact in issue", (b) be "based on sufficient facts or data", (c) be the "product of reliable principles and methods", and (d) be shown to have "reliably applied the principles and methods to the facts of the case."

²⁵⁰ *Daubert v. Merrel Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

²⁵¹ *Kumho Rire Co. v. Carmichael*, 526 U.S. 137 (1999); *General Elec. Co. v. Joiner*, 522 U.S. 136 (1997); and *Weisgram v. Marley Co.*, 528 U.S. 440 (2000).

who will be assessing the reports in evidence, whereas in the US in exercising the admissibility test the court operates a gatekeeper function for later review of such evidence by a jury. Furthermore, overly strict criteria on the appreciation of evidence at this early stage of development of the law in this area may be premature and not sit well with the evidentiary discretion vested in European judges. Nevertheless, these US standards serve as useful points of reference in assessing the reliability of economic evidence.

V.D.4. Exchange of data / replicability of results

521. It is recommended that the expert retained by each party be allowed to replicate the quantification of damages presented by the other party. This requires that experts make available to the other side's expert all the data used, including so-called "raw data" that has been treated (managed, cleaned and possibly aggregated) before being analysed,²⁵² as well as the code used to run the analysis (including the code used for the treatment of the data). To facilitate the replication, the data and code should be accompanied by sufficient documentation explaining the various methodological steps that were followed.

522. In addition to the mechanical elements of the actual exchange and handling of data, there are broader considerations of the sensitivity and confidentiality of such data. A common way to allay these concerns is to establish confidentiality arrangements as to who is permitted to access the disclosed transaction level data. This is a two stage process: (i) first the procedural, legal step of establishing a confidentiality ring (generally confirmed by court order) defining the material to be considered confidential and providing a list of the persons to permitted access to such material;²⁵³ and (ii) the practical steps of implementing system controls (including temporal limitations) governing access to the virtual data hosting site (or physical data room) required to enforce the confidentiality ring. Such steps enable the economists and lawyers to access confidential information within clearly defined limits.²⁵⁴

V.D.5. Evaluation of expert economic evidence

523. EU Member States do not currently provide guidance to courts on how to evaluate economic expert reports. In the context of quantification of the

²⁵² See [Section IV.C](#) on data collection.

²⁵³ Given the commercial sensitivities of this data, the confidentiality ring tends to be limited to external lawyers and experts, although the parties may also agree to allow in-house lawyers access to the data. Individuals from the business-side of firms or companies are very rarely given access. Any contravention of the confidentiality ring may be sanctioned by the court.

²⁵⁴ As reflected in recital 18 of the Directive, the exact measures put in place to protect confidential information will be a matter for national law. See further [Section V.C.2](#) above.

effects of pass-on, this Study seeks to contribute to providing national courts with criteria for assessing economic evidence. As noted, the US legal system already offers useful practical materials of specific assistance.²⁵⁵

524. In testing expert evidence, courts usefully may have recourse to the following methods (subject to national procedural rules):

- Cross-examination: the expert is exposed to direct questioning at trial by the opposing side's lawyer, with possible supplementary questions or requests for clarification from the judge, regarding their economic analysis and evidence.
- "Hot-tubbing": a colloquial term for the process of taking concurrent or sequential evidence from experts who give their evidence in each other's presence. The experts are sworn in together, examined, cross-examined and may ask each other questions, with the judge acting as arbiter to a debate as to the relative merits of the respective economic analyses.
- Economics tutorial: the expert teaches the court the economics underlying industrial organization and basic econometrics to help the judge better understand arguments that will be made in the expert reports, motions and hearings.
- Independent expert: such person being appointed to assist the judge in analysing the expert evidence presented.

V.E. Parallel proceedings

How to case manage parallel claims and assess prior findings of pass-on

V.E.1. Avoiding over or under compensation

525. The provisions of Articles 12(5) and 15 (and Recital 44) of the Directive aim to ensure the consistency of rulings when there are multiple claims at different levels of the supply chain relating to the same infringement of competition law, and thereby achieve the objective of avoiding over- or under-compensation.

526. Over- or under-compensation could occur if two different courts (in the same or different Member States) were to make different findings of pass-on in

²⁵⁵ 'Reference Manual on Scientific Evidence', *op. cit.* Other manuals such as those published by the ABA Section of Antitrust are of relevance and are regularly cited by courts in their rulings. See e.g. *In re Graphics Processing Units Litigation* (citing ABA Section of Antitrust Law, 'Econometrics: Legal, Practical, and Technical Issues' (2005), 1st Edition). See also Section V.D.C above with regard to the *Daubert* principles.

claims at different levels. So, if one court were to establish, for instance, that a direct purchaser has absorbed all the overcharges and another court holds that these, in fact, have been borne by indirect purchasers, infringers may face multiple liability.²⁵⁶ Conversely, if infringers successfully argue against direct purchasers that they have passed on the overcharges and, as against their indirect purchasers, that the overcharges have in fact been absorbed by the direct purchasers, infringers may escape liability.

527. The current *Air Cargo* litigation in the EU is a good example (see **Figure 19** below). To date, there are pending direct purchaser actions brought by or against freight forwarders in the UK,²⁵⁷ the Netherlands²⁵⁸ and Germany;²⁵⁹ and indirect purchaser actions brought by shippers, also in the UK²⁶⁰ and the Netherlands.²⁶¹ Because these actions relate to the same overcharged service and because the claimants are at different levels but in the same supply chain, the fact that they are being adjudicated in separate proceedings may risk contradictory outcomes.

528. No such direct risk of over- or under-compensation would in principle arise in the case of parallel claims for different cartelized services (e.g. purchased by different claimants at the same level of the supply chain). Nevertheless, the findings of pass-on in the parallel proceedings may still raise the risk of contradictory economic assessments where they concern equivalent facts.

²⁵⁶ Such a perceived problem exists in the US law. Courts can find different pass-on rates for different levels of the sales channels since proceedings relating to the different levels are typically separate. It is not uncommon for direct purchasers to claim the entire overcharge under Federal law and for indirect purchasers to claim the entire overcharge under State law. Other opt-outs (e.g., retailers, distributors, OEMs, etc.) also claim the entire overcharge in separate trials.

²⁵⁷ *Agility CIS Limited & Ors v. British Airways Plc & Ors* (pending).

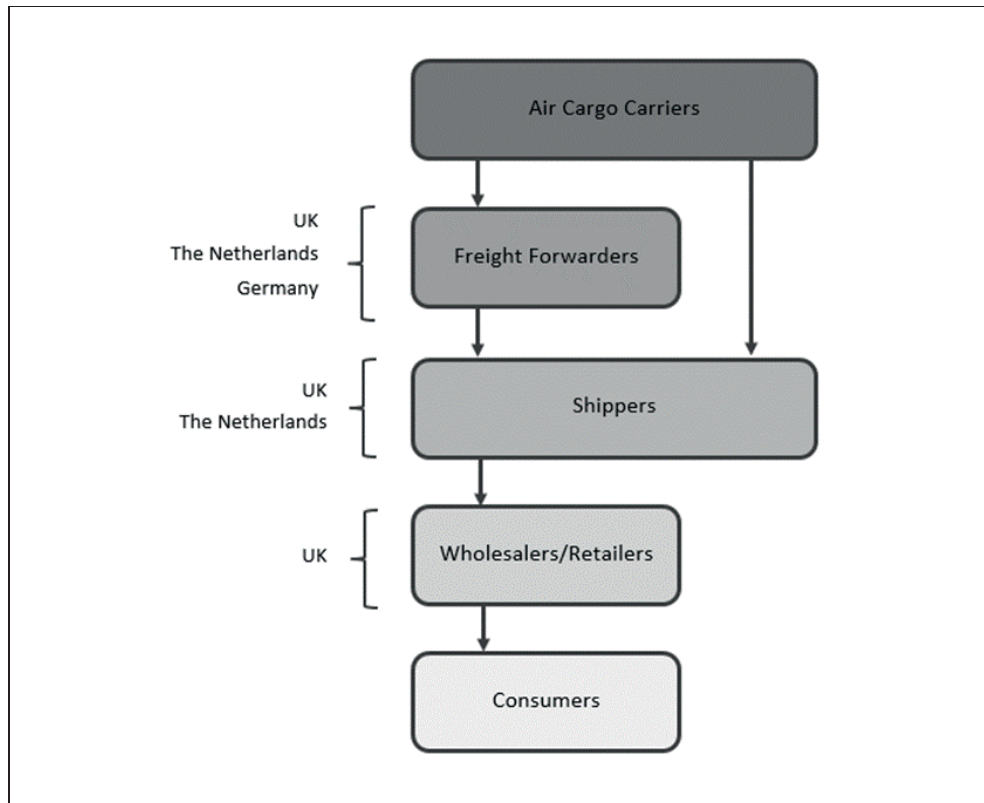
²⁵⁸ *Koninklijke Luchtvaart Maatschappij N.V. and ors v. Deutsche Bahn AG and ors* (pending).

²⁵⁹ *DB Barnsdale AG v. Deutsche Lufthansa AG and ors* (pending).

²⁶⁰ *Emerald Supplies Ltd and ors v. British Airways plc* (pending).

²⁶¹ *Equilib Netherlands B.V. v. Koninklijke Luchtvaart Maatschappij N.V. and ors* (pending).

Figure 19: Air Cargo litigation taxonomy



V.E.2. Obligations of judges

529. The Directive provides that the courts of EU Member States should apply national and EU rules (e.g., on jurisdiction, evidence and procedure) to join or coordinate parallel actions, or at least to take “due account” of actions for damages related to the same infringement brought by other claimants in the same or in a different Member State as well as judgments rendered in these cases.²⁶² An overview of relevant national and EU mechanisms which courts can use, and which have formed part of the object of the preparatory work carried out for this Study, is provided in [Annex G](#). This includes the provisions for staying proceedings or declining jurisdiction in the case of related actions pursuant to Article 30 of the Brussels Regulation.²⁶³

²⁶² Articles 12.2 and 15 of the Directive.

²⁶³ Regulation 1215/2012/EU of the European Parliament and of the Council of 12 December 2012 on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters [2012] OJ L351/1 (the “**Brussels Regulation**”). See Article 15.2 of the Directive.

530. Courts are to take due account of actions brought or judgments rendered in related actions when deciding whether a party has satisfied its burden of proving pass-on.²⁶⁴ This could potentially involve a court considering the treatment, results and interpretation of economics in separate proceedings as an aid to managing and assessing economic evidence in proceedings before it. It will be a matter for national courts to analyse each situation on a case-by-case basis taking into account all the relevant circumstances as well as their general autonomy and privilege to determine the case on the basis of the evidence before them.²⁶⁵

V.E.3. Collective Proceedings

531. The risk of conflicting decisions does not occur, logically, when all actions are heard before the same court and are to be adjudicated in a single decision. In the EU, this may become a possibility within the framework of the new UK CAT collective action regime.²⁶⁶ However, currently, this is not a generally available procedural option.

532. This consolidated procedural solution is available in Canada where the Supreme Court has clarified that direct and indirect purchasers may jointly bring class actions forming part of the same class.²⁶⁷

533. Coordination of proceedings occurs in the US with opt-out class actions.²⁶⁸ However, it is generally common for there to be different actions filed in the same or different Federal and even State courts in relation to the same anticompetitive conduct and the risk of inconsistent pass-on rulings at different levels and multiple recovery arise.²⁶⁹ In Federal courts,

²⁶⁴ Article 15(1) of the Directive read together with Articles 13 and 14.

²⁶⁵ In this respect, the House of Lords ruling in *Inntrepreneur Pub Company (CPC) and others v. Crehan* [2006] UKHL 38, paragraph 69, albeit by reference to the binding effect of a European Commission decision in a parallel case, is a case in point. There Lord Hoffmann emphasized that, pursuant to his or her judicial oath, a judge is obliged to assess all of the evidence adduced before the court and – in the absence of some legitimate estoppel in the form of *res judicata* – there should be no inherent “deference” to a decision of another judicial body. This does not obviate, as he admitted, the fact that a prior decision may offer highly persuasive evidence. Equally, in Germany, the independence of judges to make decisions based exclusively upon the parties’ ability to substantiate and prove the relevant facts is a strong principle of German law; in this respect judges have virtually unlimited power to assess and appraise the relevant facts of cases in the way they deem most appropriate.

²⁶⁶ See Section 81 and Schedule 8 of the Consumer Rights Act 2015.

²⁶⁷ *Sun-Rype Products Ltd v. Archer Daniels Midland Co.*, 2013 SCC 58.

²⁶⁸ See Rule 23 Federal Rules of Civil Procedure. Opt-out class actions refer to collective proceedings brought by a representative in which all the members of the class (i.e. in competition law cases, persons in a defined group which were allegedly affected by anticompetitive conduct) will be represented and bound by its judgment unless they expressly “opt out” (i.e. request the court that they be excluded from the proceedings).

²⁶⁹ See [Section II.B](#) above. This is the result of the US Supreme Court case-law which currently denies standing to indirect purchasers as a matter of Federal law. See *Hanover Shoe, Inc.* (rejecting the pass-on defence as a matter of US federal law) and *Illinois Brick Co.* (finding that only direct purchasers suffer antitrust injury and may sue for treble damages under § 4 Clayton Act). Indirect

coordination is generally achieved thanks to the panel of multidistrict litigation ("MDL").²⁷⁰ All related actions brought before Federal courts can be transferred and consolidated for pre-trial proceedings in a single district court under this procedural mechanism. In the US, this means that all pre-trial matters arising in direct and indirect purchaser actions brought before Federal courts, such as disclosure, class certification, summary judgment motions, and motions *in limine* are dealt with by a single court.

534. In principle, MDL is limited to pre-trial proceedings and when the proceedings are ready for trial they should be remanded to the original jurisdictions. However, in practice this rarely occurs as most cases settle before going to trial. When they do, the Federal Rules of Civil Procedure allow for formal and informal mechanisms to avoid conflicting judgments, such as the special assignment of the same judge to all cases, the establishment of lead cases, the holding of joint conferences or the ordering of stays.²⁷¹ Nevertheless, inconsistent case theories and conflicts of judgement are still common.²⁷²
535. One limitation of MDL is that it cannot consolidate State cases. However, reforms passed in 2005 make it currently easier to obtain Federal court jurisdiction.²⁷³ As a result, antitrust damages actions can now often be brought before, or removed to, Federal courts where they can then be consolidated via MDL.

V.E.4. Public enforcement proceedings

536. Findings of infringements contained in final decisions of national competition authorities or national review courts are deemed irrefutably established by Article 9 of the Directive. Recital 34 of the Directive clarifies that this covers the nature of the infringement and its material, personal, temporal and territorial scope. Nothing is said in relation to the findings of effects in

purchasers may however file claims on the basis of State law in almost half of the States of the United States. See, e.g., *In re CRT Litigation* (citing the following States as States in which indirect purchasers may bring claims on the basis of State law: Arizona, California, District of Columbia, Florida, Hawaii, Iowa, Kansas, Maine, Michigan, Minnesota, Mississippi, Nebraska, Nevada, New Mexico, New York, North Carolina, North Dakota, South Dakota, Tennessee, Vermont, West Virginia, and Wisconsin). The law on whether and to what extent indirect actions are allowed in certain states is still evolving, including through legislative action. See American Bar Association, 'Indirect Purchaser Lawsuits: A State-by-State Survey' (McCarthy et al. eds. 2010).

²⁷⁰ See Multidistrict Litigation 28 USC § 1407(a).

²⁷¹ See 'Manual for Complex Litigation' (Fourth) § 20.14.

²⁷² There has not been a case in US where claims by classes at different levels in relation to the same infringement have gone to trial at the same time in front of the same judge or jury. Nevertheless, judges understand that some kind of apportionment would be necessary if this were ever to occur. See Tr. of Motions Hearing, *In re SRAM Litigation*, MDL No. 1819, Dec. 14, 2010, at 8 ("Let's say there's a big verdict for the [direct purchasers] and then a verdict for the [indirect purchasers]. We have a double recovery. It seems to me that wouldn't be allowed. There has to be some sort of method of allocating ... and I don't quite know how one would do that.").

²⁷³ The Class Action Fairness Act 28 U.S.C. Sections 1332(d), 1453, and 1711–1715.

relation to pass-on. On this, the Directive requires Member States under Article 15 to ensure that national courts take due account of relevant information resulting from the public enforcement of competition law.

537. As indicated in Section V.B, any reference or finding with respect to pass-on in the administrative proceedings needs to be properly contextualized by the civil judge, bearing in mind that it falls to the national court, and not to the competition authorities, to determine the extent of loss caused to those who have brought the damages actions.²⁷⁴

²⁷⁴ See in this regard *Spanish Sugar II* (2013) and judgment in *Otis and Others*, EU:C:2012:684, paragraph 66.

VI. 39 steps: a checklist for judges

538. This section presents a practical checklist of issues that a national court in the EU may find useful in assessing economic evidence in relation to the quantification of pass-on and volume effects caused by a competition law infringement. Specifically, we identify a list of questions that may assist courts in assessing economic evidence presented by experts and in investigating the robustness of that evidence. This list will benefit from development in time as the legal and economic practice in this area evolves in the EU, and should be placed within the context of national courts' broader role of assessing issues of evidence and causation in accordance with applicable rules and procedures.
539. The section is split into five parts which focus on: (A) Preliminary Issues; (B) Quantification of the Pass-on Effect; (C) Quantification of the Volume Effect; (D) Holistic Approaches; and (E) Robustness of Estimates. We provide cross references to sections in the Study where relevant and these should be consulted for a fuller exposition of the issues raised. The glossary of terms set out in [Annex A](#) may also usefully be consulted for the definition of certain terms employed.

VI.A. Preliminary issues pertaining to the estimation of the effects of pass-on

The role of pass-on

Question 1: What role is pass-on alleged to have played? Does the defendant allege that the claimant has passed on the overcharge? Does the claimant allege that purchasers from the infringer have passed on the overcharge to it? Are both effects alleged?

540. Pass-on may be alleged in different ways by parties to competition litigation. The defendant (who is alleged or found to have committed an infringement of competition law) may contend that the direct harm caused to the claimant by the overcharge has been reduced or eliminated because the claimant has passed on (part or all of) the overcharge downstream to its customers. Alternatively, the claimant may be an indirect purchaser and allege that the overcharge has been (partly or totally) passed on to it by direct or indirect purchasers, thus causing it harm.²⁷⁵ The Directive establishes rules relating

²⁷⁵ In general, pass-on need not be 'all-or-nothing'. Economics suggests that pass-on can range from 0% to 100% and, in theory, can even be greater than 100%.

to legal presumptions and burden of proof in each case.²⁷⁶ It is important that courts understand how pass-on is being alleged, which presumptions apply and which party has the burden of proof.

Experts' approach to the effects of pass-on

Question 2: Do the estimates presented or proposed by experts account for all relevant effects of pass-on? In particular, do the damage estimates include the passing-on effect and the volume effect? If not, what are the reasons for omitting one or more of these effects?

541. Where pass-on has occurred, the damages that result from an overcharge should, where possible, be adjusted to take account of two effects, namely: (i) the pass-on effect; and (ii) the volume effect. Depending on the approach selected, these effects can be estimated separately (and sequentially) or together (simultaneously), e.g. where the total harm caused by the overcharge is calculated holistically.²⁷⁷ Questions of national law on, *inter alia*, procedure, pleading and evidence will influence the way in which these effects are alleged and evidenced in court. Nevertheless, national courts should try to ascertain during the course of proceedings which components of damage and which quantification methods are being proposed by experts (and why). At the same time, experts should explain their chosen approaches, the reason for their choices, and if and how they propose to deal with the different components of damage.

The role of economics

Question 3: What role does economic analysis have in the assessment of pass-on in the case at hand?

542. Economics can play an important role in explaining how a cost increase (resulting from an overcharge) provides an incentive for firms to adjust their price(s) and identify circumstances in which those price increases are likely to be smaller or greater. It further provides a structure for understanding the extent to which any price increases may lead to a reduction in output. As such, economic reasoning provides a framework within which evidence of both a qualitative and a quantitative nature can be evaluated. It can guide the expert to eliminate implausible explanations of pass-on effects and to

²⁷⁶ See [Section V.A.2](#). The Directive is to be implemented into national law by 27 December 2016. In addition, regard should be had to the *acquis communautaire* arising from CJEU case-law (see [Section II.C](#) above and paragraph 13 of the Preamble to the Directive).

²⁷⁷ Holistic approaches (Discount Approach and Simulation Approach) are described in [Sections IV.A.5](#) and [IV.A.6](#).

focus the collection of relevant information and data that will help in the assessment of the quantum of effects.²⁷⁸

543. At the same time, any economic analysis should be consistent with the factual evidence relating to the case in hand, such as the relevant behaviour of firms and observed market outcomes. Detailed predictions regarding pass-on in a particular situation will typically be sensitive to the specific circumstances of the case. In particular, predictions from economic theory (which will, to a greater or lesser extent, depend on specific assumptions) should be tested against evidence on how the relevant firm in fact sets prices and the extent to which it has responded to relevant changes in circumstances.²⁷⁹ Absent sufficient, reliable information on the specific facts of the case at hand, economic theory alone can only offer broad guidance on the magnitude of pass-on effects. Sound economic analysis will take into account all available evidence, and if possible be supported by a robust empirical analysis.²⁸⁰

Qualitative evidence

Question 4: Does the expert report take into account evidence of a factual nature, notably on the relevant firm's pricing policy?

544. The Study focusses on evidence of the effects of pass-on of a quantitative nature. However, in addition to the sources of information used for constructing quantitative analysis (accounting data, invoice data, etc.) and the quantitative analysis itself, courts and experts should consider other types of evidence, of a "qualitative" nature, in order to ensure the analysis fits with the facts of the case at hand. Such evidence might include evidence of how a particular firm sets its prices (e.g. price regulation, cost plus contracts, pricing algorithms, fixed mark-ups, internal pricing guidelines, etc.).²⁸¹ These mechanisms may determine or influence to varying degrees the relationship between the overcharge and pricing (whether to establish such a link or exclude it) and should be properly considered by experts.²⁸²
545. The absence of a mechanistic relationship between costs and prices does not necessarily imply that pass-on is unlikely, however. A strong causal relationship between the overcharge and the purchaser's prices may still exist. Equally, the notional existence of such policies may not mean that they are necessarily adhered to in practice. Therefore, while pricing policies

²⁷⁸ See [Section III The economics of pass-on](#) and [Section V.B.3](#) above for full details.

²⁷⁹ See [Section III.A.1](#), at paragraph 109.

²⁸⁰ See, in particular, Introduction to [Section III](#), [Section III.A.1](#) and [Section V.B.3](#).

²⁸¹ This evidence may be based primarily on documentary evidence but may also be complemented by witness testimony which assists in explaining the policies and their application.

²⁸² See on this [Section IV.A.3.2.b](#).

and formulae are important, their application in practice should be appraised and, where reasonable and proportionate, tested against evidence of a quantitative nature.²⁸³

Question 5: Does the expert consider other relevant evidence, such as testimony from industry experts, market studies or NCA decisions?

546. Other types of qualitative evidence of a more general nature include evidence on how particular markets operate, how firms generally take into account costs in their pricing on that market or declarations by firms which relate to the pass-on of costs. Examples might include market studies, the testimony of industry experts or analyses undertaken by competition authorities. Given their varying degrees of generality, care should be taken with applying this type of evidence to the particular case at hand and observations should be properly contextualized.²⁸⁴ At the same time, such evidence may inform economic analysis in damages claims and may assist the court in assessing whether pass-on is likely to have occurred (particularly where other evidence is limited). Where evidence of the type considered here has, in turn, been informed by economic analysis, this may also be a relevant factor to take into consideration.²⁸⁵

Plausibility of pass-on. Disclosure

Question 6: Does the expert economic analysis, and supporting facts presented by parties, provide sufficient support for the plausibility of the alleged pass-on? Is disclosure appropriate and to what extent?

547. National courts may consider it good practice to determine as a threshold question - e.g. prior to making evidentiary orders - whether pass-on is plausible in the particular circumstances of the case. In considering whether a request for disclosure has been justified by the requesting party, courts are to assess the facts and evidence reasonably available to the parties which are used in support of the request.²⁸⁶ This exercise may be based on evidence of a qualitative nature, such as documentary evidence of pricing policy, market studies or analyses. Insight from relevant economic reasoning can play a valuable role.

²⁸³ Ibid.

²⁸⁴ Particular care should be taken with statements in competition authority decisions given pass-on is not a focus of their attention (nor is its assessment within the scope of their jurisdiction) and such statements will not generally bind civil courts (albeit national rules on the effects of decisions may vary and should be checked). See, further, [Sections II.D.3](#) and [V.E.4](#).

²⁸⁵ See [Sections V.B.2](#) and [V.E.4](#).

²⁸⁶ See Article 5 of the Directive.

548. Economic experts may produce evidence of a qualitative nature to explain why pass-on is in their view more likely than not. The ordering of disclosure will normally also be subject to requirements of reasonableness and proportionality.²⁸⁷ These principles are important in modulating disclosure in practice and mechanisms exist to facilitate their fulfilment.²⁸⁸ Economic experts can, in particular, assist judges in this task; e.g. by explaining how they propose to use particular data in estimating pass-on effects, why such a method can be expected to result in better estimates of those effects, and what the time and cost implications of their approach are.

Evaluating economic evidence

Question 7: To what extent do the economic experts present contradictory evidence or approaches? How can such contradictions be addressed?

549. Courts may be faced with contradictory evidence or proposed approaches by experts for the parties. The rules on expert evidence, and the duties and obligations of experts, vary significantly between Member States. Nevertheless, national courts can be guided by a number of possible aids to assessing contradictory evidence. These include: (i) guidance on economic evidence and quantification methods (including robustness tests);²⁸⁹ (ii) court-appointed experts where such experts have the appropriate skill sets; (iii) *inter party* expert processes aimed at securing agreement on common approaches, principles or the scope and format of relevant data; and (iv) procedural mechanisms for testing expert evidence, such as cross-examination or hot tubbing.²⁹⁰

Parallel proceedings

Question 8: Are proceedings afoot (or finalized) in another court which address pass-on issues relevant to the case at hand? If so, what are the implications for the assessment of economic evidence?

550. A national court may find that proceedings are afoot before another court (in the same Member State or another Member State) where pass-on is at issue in the same market and at the same level, and even affecting the same firm, as in the proceedings before it. For example, one court may be faced with a claim by an indirect purchaser who asserts 100% pass-on by a direct

²⁸⁷ See [Section V.C.1.](#)

²⁸⁸ See further [Section V.C.4.](#)

²⁸⁹ This will include the forthcoming Pass-on Guidelines, as well as this supporting Study, the EC Practical Guide, the Best Practices and materials from other jurisdictions such as the US.

²⁹⁰ See further [Section V.D.](#)

purchaser and a second court may be faced with a claim by a direct purchaser from the same infringer where the pass-on defence is raised by the defendant but denied by the direct purchaser. In such circumstances, in addition to rules related to connected actions,²⁹¹ the court should apply national and EU procedural rules in order to try to avoid more than actual overcharge harm being allocated to any level of the supply chain. This may include staying or joining actions. In some Member States, collective actions may be possible and provide a mechanism for ensuring consistency. These mechanisms may allow different economic evidence to be considered jointly or, where an action is stayed, allow the court to consider the treatment of economic evidence in another case by waiting for a decision before it proceeds.

551. In some instances, a judgment may already have been adopted in the other proceedings. Where this occurs, courts should take due account of that ruling with the aim of avoiding multiple liability or the absence of liability of an infringer in assessing whether the burden of proof as to pass-on has been satisfied.²⁹² This will also give them the opportunity, where appropriate, to consider what economic evidence has been produced, how it has been dealt with by the court and whether this influences the assessment of pass-on in its own proceedings.

VI.B. Specific issues regarding estimation of the pass-on effect

552. A direct purchaser may pass on at least some of the impact of an overcharge affecting its costs to its own prices. This will give rise to a pass-on effect. Whilst this pass-on effect may partly mitigate the damage caused to the direct purchaser by the overcharge it will, at the same time, cause harm to indirect purchasers further down the supply chain. (Analogous considerations may apply at successive indirect purchaser levels.)
553. This section focusses on empirical strategies to assess the existence and extent of the pass-on effect. If adequate relevant data is available, if time permits, and if it would be proportionate, it is recommended to develop an empirical analysis to estimate the pass-on effect. If not, the expert will have to rely on more “qualitative” approaches.

²⁹¹ In particular, Art. 30 of Regulation 1215/2012.

²⁹² Article 15(1) of the Directive. See further [Section V.E.](#)

VI.B.1. Preliminary economic considerations²⁹³

554. Economics offers useful insight into whether pass-on is likely to have occurred and the factors that can be expected to affect the extent of pass-on, which can inform the estimation of pass-on effects.

***Affected costs*²⁹⁴**

Question 9: Does the evidence allow the impact of the overcharge on different categories of costs to be identified?

Question 10: Does it indicate how changes to the different categories of cost (are likely to) feed into pricing decisions in practice?

555. The impact of an input overcharge on a purchaser's pricing behaviour (and thus the likelihood of pass-on) will depend partly on how it affects the firm's costs and, notably, on the type of costs affected. Economic theory indicates that it is changes in a firm's marginal costs (for which average variable costs are often used as a proxy, in practice), rather than fixed costs, which are likely to have the most immediate influence on its pricing decisions.^{295,296}

556. This implies that even a relatively substantial overcharge may have limited immediate impact on a firm's pricing decisions if it largely affects costs which could not be avoided if output was reduced (notably, fixed costs, by definition, do not vary with output), whereas even relatively small overcharges that affect the purchaser's variable costs may be more likely to influence pricing decisions.²⁹⁷ Hence, a focus on the overall magnitude of the overcharge alone may provide a misleading view of the likely magnitude of the pass-on effect.

557. Economic theory does indicate, however, that the level of fixed costs will be directly relevant to pricing decisions in some specific situations. That will, notably, be the case over the longer term.²⁹⁸ It will also be the case if an

²⁹³ See generally [Section III](#).

²⁹⁴ See, further, [Section III.B.3](#).

²⁹⁵ Marginal costs are the additional costs associated with expanding the volume of output supplied by one additional unit. If marginal costs do not vary substantially with the level of output, a measure of average variable costs will provide a reasonable practical proxy for them. (Note however that the economic distinction between fixed and variable costs need not coincide with accounting practice.) Alternatively, it might be possible to obtain an estimate of marginal cost by estimating a cost function. (For more on cost measurement see [Section IV.C.4](#)).

²⁹⁶ The relationship between the magnitude of marginal costs and the level of output is also predicted to be a relevant factor.

²⁹⁷ Albeit smaller cost changes may raise evidentiary challenges – as to which see [Section VI.B.2.2](#) below.

²⁹⁸ Over the longer term, all costs may be variable. Increases in fixed costs may also cause firms to leave the market over such horizons. Such changes in market structure, as well as new entry, will also affect pass-on.

overcharge affects fixed costs in such a way that a firm decides to lower its output by such a substantial amount that it scales down its production capacity (e.g., reducing plant or machinery). It will also be the case if the mark-ups of a firm's prices over variable costs are set in relation to the level of fixed costs in practice.²⁹⁹ These factors will vary from case to case and will, therefore, need to be considered on a case-by-case basis.

558. In summary, a focus on identifying the impact on those cost categories that are most likely to influence pricing decisions may provide a more accurate view of likely pass-on. In this context, experts may consider focussing on avoidable costs, which in the case at hand would include all cost items that are saved when contracting output as a result of pass-on.

***Incidence of the overcharge*³⁰⁰**

Question 11: To what extent are competing firms on the relevant market affected differently by the overcharge, such that the pass-on effect may vary between different firms?

559. Economic theory indicates that the incidence of an overcharge, i.e. how widespread are its effects among the firms on the market, is likely to have a significant bearing on the extent of pass-on. The extent of pass-on of a "firm specific" overcharge is predicted to be smaller than that of an "industry wide" overcharge of the same size. Intuitively, when only one firm suffers an overcharge, its ability to pass it on profitably in an increase in price will be constrained to a greater degree by competition from other (unaffected) firms than in the scenario where those competitor firms also have their input costs increased.
560. At the same time, it is important to recognise that even a common, "industry wide" overcharge may affect different firms differently; for example, on account of the way they use the affected input or the demand conditions they face. Pass-on effects may therefore be sensitive to these differences.

²⁹⁹ The distinction between costs that are variable and costs that are fixed may not be clear-cut in practice, especially from the way these data are recorded in firms' financial records. For further insight into the classification of costs, see [Section III.B.2](#) and [Annex A](#).

³⁰⁰ See, further, [Section III.B.2](#)

Intensity of competition³⁰¹

Question 12: How does the expert evidence take into account the impact of the intensity of competition on pass-on levels?

561. The “intensity” of competition, i.e. how vigorously firms compete with each other, is predicted to affect the extent of pass-on. Economic theory indicates that the pass-on of firm-specific overcharges will generally tend to decrease as competition intensifies. Intuitively, the greater the loss of sales to competitors that a firm would suffer if it increased prices, the weaker its incentive to pass on an overcharge. Indeed, under conditions of “perfect” competition, zero pass-on of firm-specific overcharges is predicted. On the other hand, the pass-on of industry-wide overcharges is generally predicted to increase with the intensity of competition, especially in markets where all firms are relatively similar. (Where intense competition ensures profit margins are small, the incentive to pass-on a cost increase will be strong.) Exact predictions will depend on the precise character of competition, however.

It is sometimes argued that pass-on ranges from 50% in a monopolised market to 100% in a “perfectly” competitive market. Theory suggests neither proposition is necessarily correct. 100% pass-on may arise in a perfectly competitive industry subject to an industry wide overcharge, provided firms have constant marginal costs of production (the industry “supply curve” is flat; that is, the amount of output supplied by the industry is very sensitive to small changes in price). Further, the often quoted finding that a pass-on rate of 50% applies in the case of monopoly is valid only in the case of linear demand. If demand is non-linear instead, the pass-on rate could be lower (when the demand curve is a concave shape) or higher (convex demand). Without making further assumptions, it is not however possible to provide a precise estimate of the pass-on rate for any given market structure on the basis of theoretical considerations alone.

Buyer power

Question 13: Is buyer power a relevant consideration in the case? If so, how are the key factors influencing negotiations between the relevant parties affected by the overcharge?

562. In some market settings, buyer power acts as a constraint on the pricing behaviour of suppliers. It might be supposed that this would automatically enable such buyers to resist the pass-on of overcharges too. However, this is not necessarily the case. Economic reasoning suggests that a buyer’s bargaining power depends on its relative willingness and ability to ‘walk away’ from negotiations, e.g. because of the availability of alternative

³⁰¹ See, further, [Sections III.B.4](#) and [III.B.5](#).

sources of supply. Crucially, the extent of the passing-on effect may depend on the way in which the overcharge changes that willingness and/or ability, rather than the absolute negotiating strength of either party necessarily. For this reason, a detailed analysis of the specific characteristics of individual negotiations and the context in which they take place is required to establish pass-on implications.³⁰²

VI.B.2. Estimating the pass-on effect

563. There are a number of ways of estimating the pass-on effect.³⁰³ These can be divided into two main categories: (1) direct approaches, which assess affected prices and margins for the firm in question against an unaffected benchmark in order to detect the impact of the overcharge allegedly being passed on; and (2) pass-on rate approaches, which focus on the effect of a change in the relevant unit cost (affected by the overcharge) on downstream prices.³⁰⁴ The data requirements of the two methods are different. In particular, the former does not require data on affected costs, which for instance allows indirect purchasers to estimate the pass-on effect without having access to the costs of upstream purchasers.³⁰⁵

VI.B.2.1. Direct approaches

564. Experts may consider estimating directly the impact of the infringement on direct or indirect purchaser's price/margin using comparator-based techniques.

Using data on the direct or indirect purchaser's price

Question 14: Does the expert report use pricing information for the products affected by the overcharge to estimate pass-on?

565. The expert may derive direct empirical evidence of pass-on from price data (either from the seller or purchaser side of the transaction).³⁰⁶ This involves comparing the prices actually applied by the relevant firm with an estimate of counterfactual prices, i.e. the prices which it would have applied 'but for' the infringement. Controlling for confounding influences will also be an important consideration.

³⁰² See [Section III.B.6](#).

³⁰³ The principal different methods for quantifying the pass-on effect have been set out in [Section IV.A.3](#) and are summarized and ranked in [Section IV.A.7](#).

³⁰⁴ See further [Annex A](#) for definitions of these terms.

³⁰⁵ See [Section IV.A.7](#) and, in particular, **Table 2** in [Section IV.A.7.2](#).

³⁰⁶ See [Section IV.A.3.1](#).

Using data on the direct or indirect purchaser's margins

Question 15: Does the expert make use of profit margin information to estimate pass-on? If so, have margins been calculated appropriately?

566. The expert may also use information on a firm's profit margins to assess the extent to which the overcharge has been passed on. This involves comparing the unit margin earned by the firm with a corresponding counterfactual measure. A reduction in margin during the infringement period would indicate, all else being equal, that the claimant has absorbed at least part of the overcharge (i.e. the pass-on rate is less than 100%). Conversely, if margins remain constant this might indicate that pass-on is full or close to full.
567. Importantly, however, the validity of such an analysis will depend on being able to obtain appropriate margin and cost information from a firm's financial records.³⁰⁷ (In particular, the relevant margin used should exclude unaffected fixed costs. If not, comparison may be contaminated by the impact of lost volumes on the margins.)³⁰⁸ Controlling for confounding influences will also be an important consideration.

Comparator-based approaches: before/during/after and benchmarking techniques

Question 16: Is the expert using a comparator-based approach? If so, what is the basis for comparison?

568. Many empirical techniques employed to estimate passing-on and volume effects will (to various degrees of sophistication) compare the variable of interest during the period of infringement with the same, or similar, variables which are unaffected by the infringement. For example, the expert may seek to estimate the impact of the overcharge on the direct purchaser's price by:
- comparing the direct purchaser's price *during* the infringement period with its price *before* or *after* the infringement period (the "before/during/after" approach);³⁰⁹
 - comparing the price during the infringement period with a price of a similar product sold at the same time that was not subject to the infringement (a "benchmarking" approach);³¹⁰ or

³⁰⁷ See [Section IV.C.4.](#)

³⁰⁸ See [Sections III.B.2, IV.B.3.1](#) and [IV.C.4.](#)

³⁰⁹ See [Section IV.B.2.1.](#)

³¹⁰ See [Section IV.B.2.2.](#)

- a combination of the two approaches, e.g. to see whether the direct purchaser's price *relative* to that of a comparable product unaffected by the overcharge was higher during the infringement period than before or after that period (a "difference-in-differences" approach).³¹¹

Comparison over time

Question 17: Is there any uncertainty regarding the start and/or end points of the infringement?

569. When comparisons are made over time, it is important to establish whether the start and end periods of the infringement are clear or are potentially subject to uncertainty. Indeed, using an inappropriate starting or end point may lead to a biased estimate of pass-on. If there is uncertainty, experts should test the sensitivity of results to different start and end dates.³¹²

Question 18: Might inflated costs and/or customer pricing have been substantially delayed due to the time taken for the overcharge to be transmitted down the supply chain or have persisted after the infringement period?

570. For a number of reasons, experts may have to account for the delayed effect of the overcharge on downstream prices. First, the impact of the overcharge may not necessarily coincide with the infringement period exactly. For example, in some scenarios (e.g., with coordinated pricing) the effects of the infringement may persist after the infringement itself has ceased.³¹³ This may also be the case if the prices of overcharged products are fixed (e.g. by contract) for extended periods. In this case, comparisons with prices or margins immediately *after* the infringement has ended may be contaminated, thereby leading to a biased pass-on effect, unless a suitable time lag is allowed.³¹⁴
571. Second, if the claimant is an indirect purchaser, the effect of the infringement on its costs may have been delayed further as it was transmitted along the supply chain; for instance, due to the pattern and timing of contractual (re)negotiations. In these cases, again, comparisons with prices or margins after the infringement has ended may be contaminated, leading to a biased estimate of pass-on, unless a suitable time lag is allowed.³¹⁵

³¹¹ See [Section IV.B.2.3.](#)

³¹² See [Section IV.B.2.2.](#)

³¹³ See paragraphs 43 to 45 of the EC Practical Guide.

³¹⁴ To establish the relevant time lag, it might be useful to examine the effect of the infringement.

³¹⁵ See [Section IV.B.2.2.](#)

Comparison across markets

Question 19: Has the expert taken appropriate measures to verify that the benchmark employed is unaffected by the infringement?

572. When comparison is made across markets, it is important to ascertain that the selected benchmark is unaffected, i.e. uncontaminated, by the infringement. When there are many levels of the supply chain separating the claimant from the source of the overcharge, this verification process may not always be straightforward, since the expert may have to trace the effect of the infringement through a complex sequence of steps if the supply chain is long and convoluted. In this context, the expert may usefully consider using several alternative benchmarks to assess the robustness of the estimated pass-on effect.

Controlling for confounding factors

Question 20: How has the expert controlled for the potential influence of confounding factors?

573. All else being equal, pass-on might be inferred from evidence of a difference between prices, or margins, during the infringement period and before and/or after the infringement. However, this comparison will only yield robust conclusions if other factors do not contribute significantly to the observed price variation over the time periods concerned in a way which would confound the estimation of the pass-on rate. Otherwise, the analysis may attribute to the infringement the effects of these other factors.
574. There are many reasons why prices or margins might have varied over time or across markets other than as a result of pass-on of an overcharge. Adequate control for potential confounding influences is required in order to produce reliable estimates of the pass-on effect.³¹⁶ It is important, therefore, to establish what measures the expert has taken in this respect, and whether these have adequately addressed the potential problem. If sufficient data is available to capture the distinct influences at play, the expert may be able to isolate the pass-on effect using multi-variable regression analysis, in particular. Other, less sophisticated, techniques may also be used, especially where the availability of data is limited or when using more sophisticated analyses would be disproportionate.

³¹⁶ The same applies in the case of estimations of volume effects, which are the subject of the next section. Accordingly, these considerations as to taking account of confounding factors should also be borne in mind by national courts when considering estimations of volume effects.

Examples of factors influencing price or margin variation over time:

- The costs of non-affected inputs may change, e.g., reflecting changes in the price of oil, labour or inflation.
- Production technologies may change or may become more or less efficient, e.g., in response to changes in scale.
- Demand conditions may change, e.g., the pool of customers may expand or contract.
- Competitive conditions may change, e.g., competition may become more (less) intense as new entrants launch (existing competitors exit the market).
- The firm may change its pricing strategy.
- Transaction prices may change due to periodic renegotiations with customers, or the effects of volume rebates, etc.

Examples of factors influencing price or margin variation across markets:

- The cost of supplying (e.g. distribution or logistics) may be different.
- Consumer preference for the product in question might be stronger or weaker.
- Competitive conditions (even absent the infringement) might be different, implying that prices/margins are unlikely to be similar.

VI.B.2.2. Pass-on rate approaches

575. A pass-on rate can be obtained where the relationship between costs and prices is observable. Once estimated, the pass-on rate can be multiplied by the relevant overcharge to derive the price change and, so quantify, the pass-on effect. To obtain a robust estimate of this pass-on rate, the expert will have to account for the potential influence of confounding factors on downstream prices.

Question 21: Has the expert applied a pass-on rate approach? If so, how has the pass-on rate been obtained?

576. There are a number of approaches to estimating the pass-on rate, ranging from purely empirical approaches to more qualitative analyses.³¹⁷ If sufficient data is available, the expert may estimate empirically how the price of the affected input impacts on the downstream price that the purchaser charges to its own customers (e.g. to measure the influence of an overcharge on cartelised sugar on downstream prices of confectionery).

³¹⁷ See [Section IV.A.3.2](#) for a consideration of the relative weight of a number of different types of approach to assessing the pass-on rate.

Using pass-on rates to estimate small pass-on effects

Question 22: Does the pass-on rate estimate used by the expert provide an appropriate measure of the effect on prices of the overcharge?

577. Where, in particular, an overcharge causes only a relatively small change in costs, it may be difficult to detect reliably or directly the impact on downstream prices. In this situation, pass-on rates for the affected input (obtained using the relationship between prices and larger cost changes, and not necessarily based on cost changes caused by the infringement) can be used to estimate the pass-on effect. For example, the price of an agricultural commodity (such as cocoa) may fluctuate substantially as a result of the effect of weather variability on crops, as well as being affected by a small overcharge. The impact of these larger weather-related cost fluctuations on downstream prices for the derived products (such as chocolate) might be used to estimate a pass-on rate, which can then be used to obtain a measure of the (small) pass-on effect of the overcharge.
578. However, the use of pass-on rates derived in these circumstances relies on the assumption that the impact on prices of a small overcharge is comparable (albeit on a smaller scale) to the cost changes which informed the estimate of the pass-on rate. The cost changes analysed should impact on relevant variable costs in a similar way to the overcharge for this to be true. If they do not, a very different effect on prices may arise, and any inferences drawn regarding the effects of the overcharge may be misleading.³¹⁸
579. Pass-on rates derived from the effects of cost changes involving inputs other than that affected by the infringement may also be used for this purpose. This includes the use of aggregate cost measures, which combine the costs of other inputs with that of the affected input.³¹⁹ In such an analysis, however, it is (implicitly) assumed that the pass-on rate will be the same regardless of the input considered. In many cases, this may be reasonable, economically. However, this assumption is critical and, to the extent possible, should be tested against relevant facts. When estimating pass-on effects in this way, it is preferable, where data permits, to identify a proxy that accounts for a similar share of marginal cost to the affected input.

³¹⁸ For consideration of the input costs to use in such analysis, see [Section IV.B.1.1](#).

³¹⁹ See [Section IV.B.1.1](#).

Question 23: Are there frictional or other reasons why prices might be rather “sticky” in practice?

580. There may be reasons, such as the presence of so-called “menu” costs, associated with price adjustment itself, which will discourage price responses to small cost changes, making pricing behaviour more “sticky” than might otherwise be expected.³²⁰ It may be, for example, that there is a cost to adjusting or renegotiating prices that means that firms will be more reluctant to pass on small cost changes (or, at least, will do so less frequently) than larger ones. Similar effects may also arise if small cost changes are not readily recognised by the relevant firm. A careful assessment of relevant evidence is therefore required before a pass-on effect is estimated in these circumstances.

VI.C. Specific issues regarding estimation of the volume effect

581. When a claimant passes on part or all of an overcharge, it will almost invariably lose sales volumes and will suffer harm in the form of the lost profit margins that would have been earned on those sales.³²¹ The Study presents a number of different methods for quantifying this volume effect.³²²

VI.C.1. Preliminary economic considerations

582. Economics highlights that an increase in price and a reduction in volume are inherently linked. The trade-off between the higher margins generated by a higher price and the resulting loss of sales volume underpins a firm’s pricing decisions.³²³ The elasticity of the firm’s demand - i.e. the sensitivity of demand to changes in price - determines the relationship between these two effects.

583. In a monopoly setting, economics implies that the volume effect will exceed the pass-on effect (though the difference will become increasingly small the smaller is the overcharge).³²⁴ In non-monopoly settings, however, the extent of the volume (and pass-on) effects will also depend on how competitors change their prices. If other firms are also affected by the overcharge, they can generally be expected to pass this on to some extent in their prices, and this will mitigate some of the effects of a firm’s own pass-on. The way rivals

³²⁰ This might also be the case if relevant output changes must be contemplated in discrete, ‘lumpy’ increments. See, for example, the discussion at paragraph 121 above.

³²¹ See [Section I.B.2.](#)

³²² These are set out in [Sections IV.A.4](#) and summarized and ranked in [Section IV.A.7.](#)

³²³ See [Sections I.B.1](#) and [Section III.A.2.](#)

³²⁴ If not, the monopolist could have been expected to set a higher price in the first place, i.e. absent the infringement.

respond to another firm's pass-on will also affect the magnitude of the volume loss.

VI.C.2. Estimating the volume effect

584. The loss of profit caused by the volume effect is the difference between the revenue that would have been earned on the lost volumes caused by pass-on and the additional costs that would have been incurred supplying those volumes. The two elements required to quantify the volume effect are: (i) an estimate of the lost sales volumes; and (ii) a measure of the relevant profit margin (or mark-up) that would have been earned on those sales, i.e. but for the infringement (the "counterfactual margin").

VI.C.2.1. Estimating lost volumes

Estimating the output reduction directly

Question 24: Has the expert estimated the reduction in output that is associated with pass-on of the overcharge directly?

585. Experts can estimate the lost volume directly using comparator-based methods (referred to in the Study as the Direct Approach or the Counterfactual Volume Approach).³²⁵ For example, the expert may seek to estimate a volume effect by comparing the direct purchaser's output *during* the infringement period with its volume *before* or *after* the infringement period. A critical issue for the reliability of this type of analysis is the ability of the expert to control appropriately for the effects of confounding influences.

Using elasticity estimates

Question 25: Has the estimation of lost sales volumes relied on an estimate of the price elasticity of the claimant's demand? If so, how have relevant elasticities been constructed?

586. If an estimate of the pass-on effect has already been obtained, then this can be combined with a measure of the price elasticity of the claimant's demand to estimate the lost volume of sales. An elasticity measure is typically expressed as positive number,³²⁶ and gives the percentage change in volume brought about by a 1% change in price.

³²⁵ See [Sections IV.A.4.1](#) and [IV.A.4.3](#).

³²⁶ Price and volume demanded are negatively related. This reflects the fact that a price increase normally gives rise to a reduction in consumption of the product in question. As a result, technically

Suppose that, as a result of the pass-on of an overcharge, the claimant's selling prices have been elevated by 2.5%, and that the relevant elasticity measure is 2. The percentage change in volumes is then 5% ($2 \times 2.5\%$).

587. The expert must use an elasticity measure that is appropriate for the circumstances of the case. An overcharge may affect an individual firm or an entire market, as well as intermediate variants, and the pattern of pass-on effects on prices will generally reflect this. The elasticity measure used should take into account these differences. In simple terms, when the overcharge is industry-wide and the prices of all firms in the industry are likely to be increased similarly, a market price elasticity of demand may provide a better indicator of the likely volume effect than an own-price elasticity measure.³²⁷ On the other hand, when the overcharge is firm-specific, the firm's own-price elasticity of demand may provide a more appropriate estimate.

A firm's own-price elasticity measures how much volume the firm would lose when it raises its own price, holding the prices of competitors constant. The market price elasticity contemplates the proportionate reduction in aggregate volumes sold in response to a market-wide price rise. In the latter case, since all competitors increase prices, there will be relatively little net switching between competitors. (Any net switching will, therefore, be outside the market.) In the former case, the firm's consumers would primarily switch to competitors within the market. When competition on the market is intense, the firm's own price elasticity can be very high, reflecting the fact that it would lose most of its customers to competitors if it attempted to increase prices unilaterally.

Question 26: What assumptions were required to arrive at the elasticity estimate?

588. The magnitude of the elasticity of demand will usually vary as price changes, e.g. as a consequence of pass-on.³²⁸ As a result, elasticity measured at one price level will only deliver an approximate estimate of the volume loss. Notably, if the price observed during the infringement period is affected by pass-on, the volume loss implied by the corresponding elasticity estimate will usually be overstated. The impact of this error could be significant when the pass-on effect is substantial. The expert should recognise the implications of this for the assessment.³²⁹

an own-price elasticity measure is always negative; however, it is often reported as a positive number, because it is understood to indicate the extent of the quantity decrease associated with an increase in price.

³²⁷ This is likely to offer a less accurate measure when significant asymmetries exist between firms.

³²⁸ The constant elasticity form of demand is an exception.

³²⁹ If sufficient data are available and time permits, in some cases a demand model can be estimated econometrically which will allow the volume loss to be calculated whilst taking account of the variation

589. The expert may decide to use suitable alternative proxies, such as elasticity estimates for the same product from a different period or a different geographic market, or for a different, but related, product. The key issue is whether these benchmarks are suitable. For example, consumers in these benchmark markets or periods may have different preferences, and as a result may react differently to changes in price, thereby yielding a measure of elasticity that could differ materially from the one at issue. Nevertheless, if the expert can ascertain whether these benchmarks are likely to over- or understate the relevant elasticity measure, these proxies can prove useful in gauging the size of the volume effect.

Question 27: What account has been taken of the effect of competitor responses?

590. Own-price elasticity estimates will not take account of the responses of competitors, which may have a significant bearing on the magnitude of the volume effect. Depending on the nature of those strategic responses, the own-price elasticity may over- or understate the relevant volume effect.

VI.C.2.2. Measuring the counterfactual margin

591. The second component that is needed to estimate the volume effect is the “counterfactual margin”. The counterfactual margin is equal to the price per unit that would have been secured on lost sales less the cost per unit that would have been incurred as a result of the increased sales volume.

Question 28: Has the expert derived a measure of the counterfactual margin from the observed margin? If so, has this measure been adjusted to account for the impact of pass-on?

592. Experts might use the actual (observed) margin earned by the firm during the infringement period as a proxy for the counterfactual margin. However, the magnitudes of these margins might be quite different in absolute terms. The counterfactual margin will only be the same as the margin earned during the infringement period if the relevant pass-on rate is 100% (i.e. the effect of the cost increase is exactly offset by the increase in the direct purchaser’s price, leaving the margin unchanged).³³⁰ If a different pass-on rate has been established by the experts or the court, this assumption will be incorrect and adjustments should be considered. If the pass-on rate is less than 100%, the

in elasticity. However, an assumed shape of the demand curve might be an issue in such instances. See [Sections III.B.5.1](#) and [IV.B.6.](#)

³³⁰ See [Section IV.B.3.](#)

margin earned during the infringement period is likely to represent a lower bound (a minimum) for the counterfactual margin.

Question 29: Has appropriate adjustment been made to ensure that the cost data that has been used to calculate the counterfactual margin reflects relevant avoided costs only?

593. It is critical that the counterfactual margin used in the estimation takes into account only the additional costs that would have been incurred by the claimant absent the infringement.

A firm suffers a reduction in output of 10 units. As a result, (some of) the costs that would have been associated with supplying those additional 10 units will have been avoided. The counterfactual measure of costs should include these avoided costs. Costs, which have not changed as a result of the volume loss, should not be included. However, if the effect of the infringement is sufficiently large and prolonged, the claimant may suffer such a reduction in output that it could scale back its production capacity (e.g. plant, machinery) and avoid certain fixed costs as well. These costs should be included when calculating the counterfactual margin on the lost sales volumes.

594. Due to the need to distinguish carefully between avoidable costs (i.e. those costs saved as a result of the reduction in volumes) and other costs, the relevant measure of costs that is required will typically not correspond directly to the accounting data recorded by firms in the normal course of business. Adjustments may be needed to arrive at an appropriate economic measure of avoided costs. For example, it may be that some fixed and common costs have been allocated to individual product lines and need to be excluded.³³¹ Where such adjustments are not possible due to the way the data is kept, any upward or downward biases in the estimated counterfactual margin should be identified by the expert.

Question 30: Did the purchaser engage in input substitution during the infringement? That is, has the purchaser increased the volumes of alternative inputs used?

595. In some cases, in response to the overcharge, the purchaser may have purchased other inputs to avoid the cost of the more expensive input (this is known as the “input substitution effect”).³³² Absent the infringement, these purchases would not have been made. The effects of such adjustments must be removed from the measure of the counterfactual mark-up.

³³¹ See [Sections IV.B.3.1](#) in relation to this issue.

³³² See [Section III.B.2](#) and [Section IV.B.3](#).

VI.D. Specific issues regarding holistic approaches

Question 31: Has the expert adopted a holistic approach to quantifying damage? If so, what are the critical economic assumptions that underpin the approach adopted?

596. The expert may adopt a holistic approach to quantifying the total damage suffered by a claimant. The discount and simulation approaches constitute two such approaches.³³³ They account simultaneously for the pass-on and the volume effects in an integrated analysis, drawing on formal economic models to do so.
597. An advantage of such approaches is that they will, typically, take explicit and integrated account of the changes in competitors' behaviour. They may also use theoretical insights to derive simplified expressions for total damage which depend on more readily-observable variables.
598. At the same time, the expert will typically make specific (and often, therefore, strong) assumptions about the nature of competition, costs, and consumer demand, for example. Results may depend delicately on the specific assumptions that are made. These assumptions will, therefore, need to be made explicit and their implications explained by the experts. The reasonableness of the assumptions and the implications for the magnitudes of the damage estimates obtained will need to be considered on a case-by-case basis. (See, further, the discussion of the robustness of estimates below.)

VI.E. Specific issues regarding the robustness of estimates

599. National courts should consider a number of checks to probe the reliability of expert economic analysis. In general, reliability will depend on the quality of the information used and on the nature of the assumptions made in analysing that information. Both should be investigated.

Assessing the robustness of assumptions

Question 32: Does the expert identify the key assumptions upon which the damage estimate relies? Are the assumptions consistent with salient facts and market outcomes?

600. To arrive at an estimate of the effects of pass-on and volume effects, it is likely that the expert will make a number of assumptions, e.g. in an empirical

³³³ See [Section IV.A.5](#) and [Section IV.A.6](#), respectively.

model. These assumptions should be set out transparently, and the extent to which the results depend on them explained. Importantly, where the assumptions made have a relevant impact on the estimated pass-on and/or volume effects, the expert should discuss the plausibility of these assumptions, notably taking into consideration available factual evidence of the specific circumstances of the case at hand.

The quality of data³³⁴

601. To quantify the pass-on and the volume effects, the expert may draw on internal company data (accounting or transaction level data) from either the claimant(s), the defendant(s) or third parties, or from publicly available information. The quality of the data used will impact on the reliability of the quantitative analysis.

Question 33: How was data used by the expert recorded by the relevant firm? Is the way data is recorded consistent with factual realities?

602. The data may exhibit particular patterns that are simply due to the way the data is recorded.

Monthly margin data may be systematically smaller every three months because some costs are only recorded on a once-a-quarter basis. (Similar effects may apply in respect of end-of-year discounts, etc. too.) In this case, the expert may either aggregate the data to the quarterly level or consider adjusting the data to smooth these artificial fluctuations, i.e. by 'spreading' the cost item across each of the three months in the quarter.

603. Data may be aggregated by firms and averaged across different products. In this case, great care is required in interpreting the results obtained. In particular: (1) averaged data may blend prices or margins across affected and unaffected products, thereby diluting any pass-on effect; and (2) the average price or margin may change simply because the mix of component products that make up the average changes, even if there is no change in the price of any individual product. It is therefore important that the expert obtains and uses data at the appropriate level of (dis)aggregation. Obtaining sufficiently granular (detailed) data is often critical in such instances.

³³⁴ On the issue of data quality, see [Section IV.C](#).

Question 34: Has the expert cleaned or adjusted the data used to compute effects? Did the expert adopt any assumptions when preparing the data? Are these clearly set out in the expert's report?

604. A perfect dataset is scarcely available in practice. Data analyses may be based on datasets which are incomplete (missing data points) or contain recording errors. The expert may have to "clean" the data. This may involve correcting/excluding data points or filling gaps. To prepare the data, the expert may have to make a number of assumptions. The adjustments to the data made by the expert should be transparent and replicable. The sensitivity of the results to these adjustments, and to errors in the data, should be examined.

Sensitivity analysis

Question 35: Does the expert evidence discuss the sensitivity of the damages estimates to alternative assumptions and/or data inputs?

605. It is sensible to explore the sensitivity of estimates to the specific assumptions adopted and the quality of the data used in quantitative analysis. The exact scope of such a sensitivity exercise may depend on: (1) the extent of underlying concerns in relation to the reliability of the data used and approach adopted; (2) the range of plausible alternative modelling approaches and data sources that have been identified; and (3) the resource and time costs involved (bearing in mind the plausible magnitude of any variations in the estimates).

Question 36: Where econometric evidence is presented, is the sensitivity of the regression results to alternative plausible model specification and to the inclusion/omission of some data points considered?

606. If sufficient data is available, the expert may consider adopting a number of alternative approaches to the estimation in order to test the sensitivity of results to the selection of a particular approach. The expert may also undertake a so-called "sensitivity analysis", which considers more formally how the results of the economic analysis vary as key assumptions are adjusted to reflect potentially varying circumstances in the case at hand. For example, when conducting a multi-variable regression analysis, it is important to check the extent to which the results would differ significantly if reasonable changes were made to the set of explanatory variables, the functional form of the economic/econometric model, or the dataset used. If the outcomes differ in important ways, this indicates a sensitivity to

assumptions or data and may point to fundamental reliability issues with the approach or data adopted.³³⁵

Establishing the (statistical) precision and significance of the estimates

Question 37: With what confidence should key parameter estimates be adopted?

607. Where detailed data analysis has been conducted, the expert can obtain statistical measures of the potential margin of error around the estimated parameters of interest (e.g. the pass-on rate).³³⁶ To assess this uncertainty, the expert can construct a so-called confidence interval, which gives the range of values that contains the true value of the parameter of interest with specified probability, assuming that the model is correctly specified. (It is common to use a 95% confidence interval.)³³⁷ The narrower the interval, the more precise is the estimate, indicating a smaller margin of error.

Question 38: Are results statistically significant?

608. The expert can test whether the parameter estimates obtained (e.g. the relationship between input cost and price) are statistically different from hypothesised values. These hypothesised values are often zero in practice. (For example, a zero value for the pass-on rate would imply no passing-on effect.)³³⁸ In this case, the results are said to be statistically significant if the hypothesis that the true value of the coefficient is zero can be rejected with enough confidence; i.e. that there is a sufficiently low probability that the discrepancy between the estimated value of the parameter and the hypothesised value (here zero) cannot be explained by random error. Typically, a probability threshold of 5% is adopted (in line with the 95% confidence interval highlighted above).

³³⁵ See [Sections V.D.3.](#)

³³⁶ Because the analysis will normally be based on a sample of data, the estimated parameter is unlikely to be exactly the "true" value due to sampling error (as a sample is only a portion of the dataset of interest).

³³⁷ For more detail see EC Practical Guide at paragraphs 86-88.

³³⁸ Note that results that are statistically significant may not be economically significant, and vice versa. For instance if the pass-on rate is precisely estimated, at 0.002%, it can be said to be statistically significant. However, the estimated pass-on rate is so close to zero, that it may make no difference to assume that there is no pass-on effect. Conversely, the estimated pass-on rate may not be statistically significant but appear to be large enough, say 25%, to be economically significant. When the sample size is large enough with enough variation and the results are not statistically significant, then the estimated pass-on rate at 25% is clearly unreliable. In other cases, the sample size might be small or there might not be enough variation in the data (i.e. cost changes are few) to estimate with enough precision the pass-on rate. The estimated pass-on rate can be viewed as the best possible estimate, but it might be prudent to caveat any damage calculation based on such an estimate.

Question 39: Is there sufficient data to obtain reliable results?

609. The sample size (the number of observations) used in an estimation affects its statistical precision. The larger the sample size, the narrower is the confidence interval, and thus the more precise the estimates obtained. Importantly, however, when the sample size is already large, expanding the data sample further will deliver limited improvement in terms of precision; in this case the cost of gathering more data may outweigh the benefit.

Annex A – Glossary of terms

Actual harm / Actual loss / Direct loss / Direct harm - Terms used interchangeably in this Study to refer to the increased cost caused to a person by an infringement which is recoverable in law (“*damnum emergens*”). In the context of competition damages claims, this will normally be the price difference between what was actually paid and what would otherwise have been paid in the absence of the infringement, less any passing-on of the overcharge.³³⁹

Average cost – The total cost (the sum of fixed and variable costs) associated with supplying products or services divided by the number of units produced.

Avoided / Avoidable costs – Costs incurred when supplying a discrete increment in output that would be avoided if that increment was not supplied. This could include costs that are not variable costs.

Bertrand competition – A characterization of oligopolistic competition in which firms select price to maximise profits, taking the prices of other firms as given. (The quantity each competing firm sells is then determined by the matrix of competitor prices, among other factors).

Buyer power – Refers, to a situation in which suppliers of goods or services face buyers with a strong bargaining position. In the context of this Study, this may influence the ability of firms to pass on cost increases to such buyers.

Confidence interval – A statistical estimate, expressed as a range for a parameter. The estimated range of values contains the true value of the parameter of interest with a specified probability. (It is common to use a 95% (probability) confidence interval).

Confounding factors – A confounding factor is a variable whose effect needs to be taken into account when examining the relationship between a dependent variable (say earnings) and an independent variable (say baldness), otherwise that relationship would be incorrectly estimated. (For instance, suppose that baldness is positively correlated with high earnings. By not accounting for work experience, which is the true cause of higher earnings, but which is also positively correlated with baldness, the expert would incorrectly conclude that baldness has an impact on earnings.)

Correlation – Correlation measures whether two variables have a linear relationship. Two variables are positively correlated, if on average when one

³³⁹ Recital 39 of the Directive.

moves in a direction the other also does; they are negatively correlated, if on average they move in opposite directions; and they are uncorrelated, if on average they do not move together.

Counterfactual margin – The margin that would have been secured in the counterfactual scenario (see definitions for margin and counterfactual scenario below).

Counterfactual scenario – The (hypothetical) scenario in which an event (notably, a competition law infringement) has not occurred. By definition, counterfactual events are not observable.

Cournot competition – A characterization of oligopolistic competition in which firms select the quantity they place on the market to maximise profits, taking the outputs of other firms as given.

Cross-sectional data – Data collected for a given time period, e.g. across different products, firms and/or geographies.

Curvature of demand – The extent to which the slope of the demand curve (or, equivalently, the elasticity of demand) changes as output/price varies.

Deadweight loss – Loss of economic surplus when amounts of products or services are not consumed even though the satisfaction derived from such consumption would exceed the costs associated with it. Arises, for example, when the relevant price does not reflect this cost.

Demand curve – Gives the quantity of a product or service demanded at a given price level.

Differentiated products markets – Markets in which competing products have different physical attributes or qualities, which appeal to different customers, and are therefore imperfect substitutes.

Direct approach – Refers in this Study to the use of quantification methods that seek to quantify the extent of pass-on and/or the associated volume loss that results from an overcharge (possibly at various levels of the supply chain) by estimating directly the change in price or margin and sales volume, respectively, using comparator-based techniques.

Direct purchaser – A natural or legal person who acquired, directly from an infringer, products or services that were the object of an infringement of competition law.³⁴⁰

Downstream pass-on – From the point of view of a person injured by anticompetitive conduct, the pass-on of overcharges by that person to the next level down the supply chain.

Elasticity of demand – The percentage change in the quantity of a good demanded in response to a one percent increase in price; that is, the responsiveness or sensitivity of demand to changes in price. The 'own-price' elasticity of demand concerns the change in the quantity of a particular good demanded in response to a one percent increase in its own price; the 'cross-price' elasticity concerns the change in response to a one percent increase in another product's price; and the market demand elasticity concerns the change in aggregate market demand in response to a one percent change in the market price. In general, the aggregate demand elasticity will be smaller than the 'own price' elasticity, because a loss of sales to competitors within the market is excluded from the former.

Empirical analysis – Refers to the use of quantitative techniques that estimate effects, such as pass-on or volume effects, on the basis of data. These techniques include, *inter alia*, regression analysis and correlation analysis.

End-customer – The final customer in the supply chain. That is, this customer does not resell or use the input purchased to produce another product or service that is then sold.

Firm-specific overcharge – Overcharge that affects a single firm but does not affect its competitors.

Fixed cost – A category of cost that does not change with the level of output. As the time horizon lengthens, some fixed costs may become variable. In the long run, all costs are variable.

Heteroscedasticity – A variable is heteroscedastic if different groups of data points have different variance or variability. The standard OLS estimator (see definition below) assumes that the error term is not heteroscedastic; that is, all terms have the same variance.

Holistic approach – Refers in this Study to the use of quantification methods whereby total damages caused by an infringement to a claimant are calculated in

³⁴⁰ Article 2(23) of the Directive.

an integrated way, accounting simultaneously for the passing-on effect and the volume effect.

Homogeneous goods or products markets – Markets in which products share the same exact characteristics and features, which makes them indistinguishable in the eyes of consumers. These goods are perfect substitutes.

Indirect purchaser - A natural or legal person who acquired, not directly from an infringer, but from a direct purchaser or a subsequent purchaser, products or services that were the object of an infringement of competition law, or products or services containing them or derived therefrom.³⁴¹

Industry-wide overcharge – Overcharge that affects all firms in an industry.

Infringer – An undertaking or association of undertakings, which has committed an infringement of competition law.³⁴²

Input substitution – When a producer switches its demands between inputs, notably in response to a change in (relative) prices.

Inverse demand curve - Traces out the price level that give rise to particular levels of demand (cf. the demand curve, which traces out the quantities demanded at different price levels).

Loss of Profits – The loss of income derived from an infringement which is recoverable in law (*lucrum cessans*). In the context of competition damages claims, this normally refers to the loss of sales caused as a result of a firm passing on the overcharge.

Margin / Mark-up - Difference between the price per unit of a good and a relevant measure of the cost associated with that unit. In economic analysis, the margin between price and marginal costs is often of particular relevance.

Marginal cost – The additional cost associated with supplying an additional unit of output. In the short run, fixed costs do not contribute to marginal costs because fixed costs do not change with the level of output.

Menu costs – Costs that are incurred when prices are adjusted.

³⁴¹ Article 2(24) of the Directive.

³⁴² Article 2(2) of the Directive.

NCA – National competition authority. An authority designated by a Member State pursuant to Article 35 of Regulation (EC) No 1/2003, as being responsible for the application of Articles 101 and 102 TFEU.³⁴³

Non-stationary – A data series is said to be non-stationary if its mean and/or variance change over time.

Oligopoly – Refers to a market structure where a small number of large firms compete.

OLS estimator – The Ordinary Least Squares estimator is a common statistical estimator of the unknown parameters (intercept and slope) of a linear model that relates a dependent variable with a set of independent explanatory variables. An OLS estimate is found by minimising the sum of squares between the realised values of the dependent variable and the values predicted by the linear regression.

Overcharge – The difference between the prices actually paid for a product or service and the prices that would otherwise have prevailed in the absence of an infringement of competition law.³⁴⁴

Outliers – Data points that lie far from the regression line that fits all other points in the data set.

Outside option – The alternative available to a party to a negotiation if those negotiations break down.

Panel data – This is a dataset that combines cross-section and time-series data.

Pass-on / Passing-on / Pass-through – Terms used interchangeably in this Study to refer to the situation where a firm increases the sales price of its products or services in response to an increase in its costs (e.g. that which results from an overcharge).

Pass-on / Pass-through effect – The existence and extent of passing-on of an overcharge by a particular firm or group of firms, the magnitude of which can be quantified by the methods outlined in this Study.

Pass-on / Pass-through rate – The rate at which a cost change (e.g. an overcharge) is translated (i.e. passed on) into a price change. The pass-on rate is a means of measuring the pass-on effect. It may be expressed in absolute (percentage) or proportionate (elasticity) terms. A 50% pass-on rate means that 50% of an overcharge has been passed on, reducing the actual loss to the claimant

³⁴³ Article 2(7) of the Directive.

³⁴⁴ Article 2(20) of the Directive.

by half (without prejudice to the possible loss of profits caused by the volume effect).

Point estimate – This denotes a single value which serves as the “best estimate” of the value of an unknown parameter.

Price-taking behaviour – Firms take the prevailing market price as a given when making supply decisions. In perfectly competitive markets, firms are price takers because their individual actions have no impact on those market prices.

P-Value – Probability value that indicates how well the results of statistical analysis support the null hypothesis. A low p-value provides strong evidence against the null hypothesis, since this indicates that the results of the analysis based on the observed data are more extreme than one would expect if the null hypothesis were true. In general, a significance level of 5% is adopted for the p-value. However, other significance levels may be used, 1% when the data sample is large, or 10% when the sample is small.

R-squared – A common statistic that provides a measure of the goodness of fit of a regression model. The higher the R-squared value, the better the regression line fits the data. An R-squared of 1 means that the regression line perfectly fits the data while an R-squared of 0 implies that the regression does not explain any of the variation in the dependent variable.

Regression analysis – Refers to statistical techniques used to evaluate and model the relationship among several variables.

Sequential approach - Refers to the use of quantification methods whereby the assessment of damages consists of estimating separately the different components that form the quantum of damages; i.e. the overcharge, the pass-on effect and the volume effect.

Standard errors – A measure of the statistical accuracy of a coefficient estimate. The lower the standard error, the higher the precision of the estimated parameter.

Stationary – A data series is said to be stationary if its mean and/or variance do not change over time.

Statistical significance – In hypothesis testing, statistical significance implies that the (null) hypothesis is rejected with a certain level of confidence. Specifically, statistical significance is achieved when the p-value (see definition above) is less than the chosen significance level. For example, if the p-value is less than 5%, the test result is said to be statistically significant at the 5% significance level.

Supply curve – Relationship between the price offered on the market and the quantity that a firm – or group of firms - will be willing to provide at that price. The supply curve is often taken to be increasing, i.e. more is supplied as the price increases. A change in conditions on the supply-side of the market (a change in cost, in the intensity of competition, etc.) will lead to a shift of the supply curve.

Time series data - This is a dataset in which each observation concerns a single unit (i.e. a product, a firm, a market etc.) recorded at different points in time.

Umbrella / Cross-over / Spill-over effect – The impact on the prices charged by firms that are not directly affected by an overcharge because competitive pressure from affected firms is diminished.

Unjust enrichment – A situation where a claimant receives more by way of damages than the real harm caused to it. In the context of this Study this may occur as a result of the failure of a court accurately to take into account the impact of pass-on on the claimant's overall harm (i.e. overcharge less pass-on effect plus volume effect).

Upstream pass-on – From the point of view of a person injured by anticompetitive conduct, the pass-on of overcharges from higher levels of the supply chain to that person.

Variable costs – Costs that vary with the level of output. That is, variable costs increase as the level of output increases and fall as the level of output decreases.

Volume effect / Loss of sales effect / Output effect – Terms used interchangeably in this Study to refer to the situation where direct or indirect purchasers raise prices to their own customers (passing-on of overcharges) giving rise to a reduction in their volume of sales and consequently legal harm in the form of loss of profits.³⁴⁵

³⁴⁵ See paragraph 40 of the Preamble and Art. 12(3) of the Directive.

Annex B – National case-law survey

B.1. Introduction

610. Cuatrecasas, Gonçalves Pereira, together with its Subcontractors, has conducted a thorough review of national case-law in which pass-on has been alleged in the context of competition law damages actions. Subcontractors were instructed to focus their research on the last 10 years, but in certain cases, by virtue of their particular relevance, they have also identified cases dating back to 1999 (see the list in [Annex C](#)).³⁴⁶

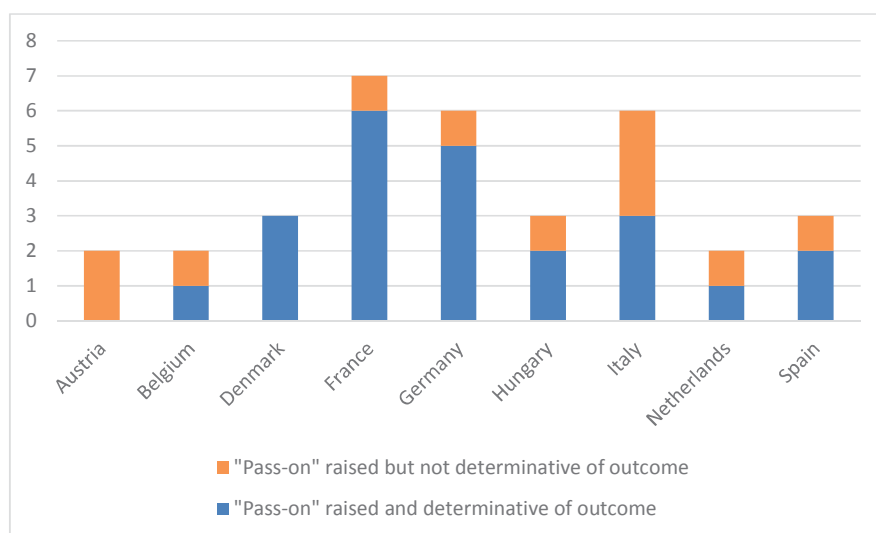
B.2. Overview

611. A total of 71 individual court decisions, issued in 34 separate cases, in 9 Member States were reported by the Subcontractors. These comprise reasoned rulings and judgments from:

1. first instance courts (31);
2. appeal courts (25); and
3. final courts of appeal (e.g. Supreme Courts) (15).

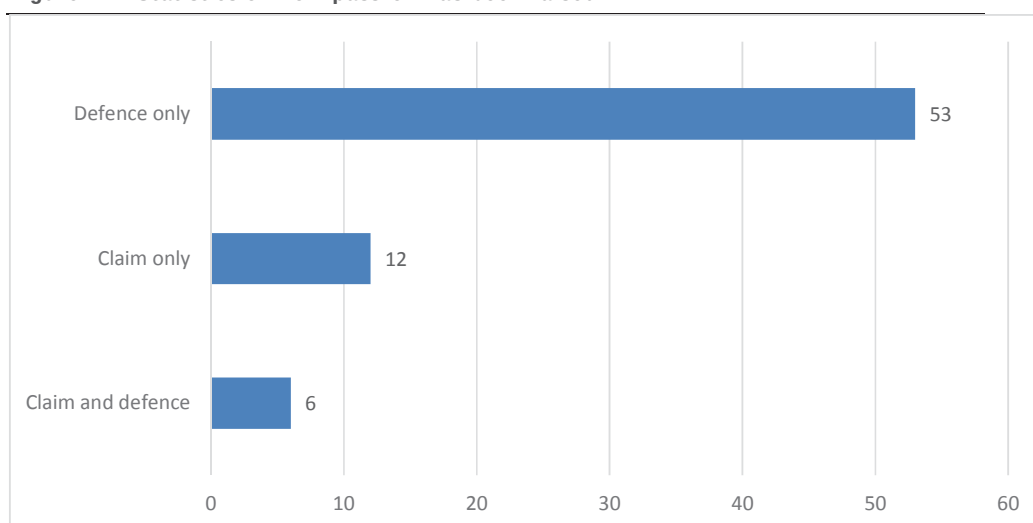
612. No case-law relating to pass-on has been reported in 19 of the 28 Member States. As **Figure B.1** illustrates, among the Member States which have reported pass-on cases Germany and Italy with 6 cases and France with 7 are at the forefront, the latter being the Member State from which more determinative cases have been reported.

³⁴⁶ For example, in relation to Denmark, Italy and Germany. Given Subcontractors focussed on the last 10 years in accordance with this Study's tender specifications, the review cannot be considered exhaustive. Additionally, there may have been instances in which cases dealing with pass-on may not have been identified because they have not been reported and/or published.

Figure B.1: Statistics on national case-law involving pass-on

B.3. Pass-on as a claim or defence?

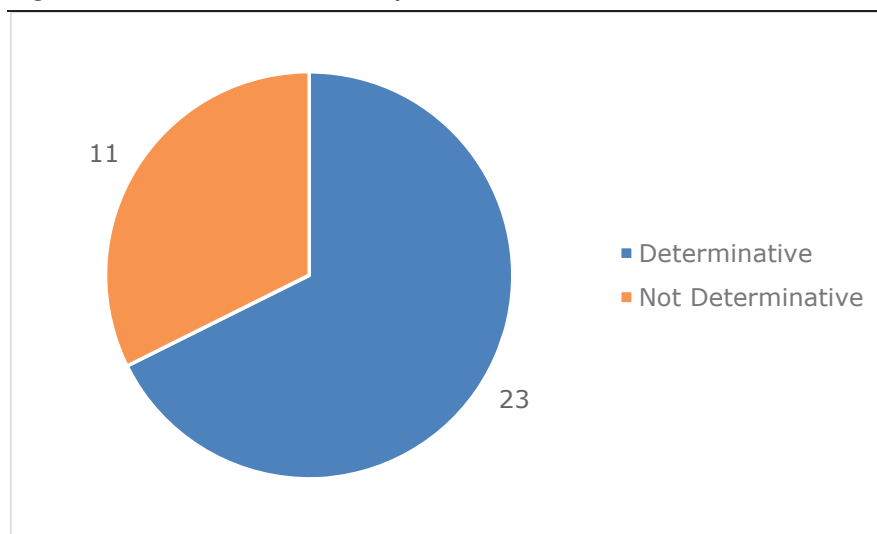
613. The graphic in **Figure B.2** below demonstrates the incidence of concluded decisions reported in the sample in which pass-on has been raised, providing a breakdown between pass-on as a factor: (i) in the defence of an infringer to an antitrust damages claim ("shield"); (ii) in support of a claim by an indirect purchaser ("sword"); or (iii) decisions where it was raised by both parties, that is, as a defence and a claim respectively.

Figure B.2: Statistics on how pass-on has been raised

B.4. Pass-on as a factor in the outcome of the decision

614. As **Figure B.3** shows, in 23 of the 34 cases reported, pass-on arguments were determinative of the eventual outcome of the proceedings and for the level of damages awarded. In the remaining 11 cases, pass-on was not determinative and was dealt with instead either in *obiter* or in addressing a point of legal principle.

Figure B.3: Statistics on whether pass-on was determinative of a case or not



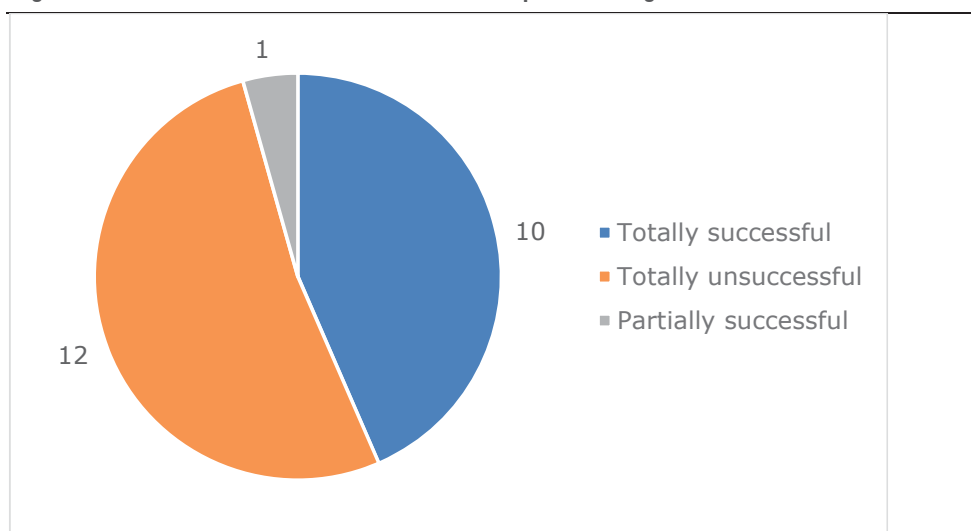
615. Of the 23 determinative cases:

- 20 were actions in which pass-on was raised and dealt with as a defence;
- 2 as claim and defence; and
- just 1 was a case where passing-on was advanced in support of a claim by indirect purchasers.

B.5. Outcome where pass-on was determinative

616. As **Figure B.4** illustrates, in the cases for which it was determinative, pass-on arguments were totally successful on 10 occasions, totally unsuccessful on 12 occasions and partially successful in 1 instance.

Figure B.4: Statistics on the success level of pass-on arguments



617. The terms in the above table have the following meaning:

- Totally successful indicates that the claims were totally dismissed specifically on pass-on grounds (i.e., a finding of 100% pass-on);³⁴⁷
- Partially successful indicates the cases where at least some percentage of pass-on was found (e.g., 50%); and
- Totally unsuccessful indicates the cases where pass-on arguments were dealt with by the court but ultimately rejected in their entirety (i.e. 0% pass-on was found to have occurred).

B.6. Conclusion

618. Given the focus of this Study is on the estimation of pass-on, it is important to note, by way of conclusion, that in only a handful of the cases we have reviewed have courts sought to quantify pass-on (these cases are explored in the Study).

619. As the figures (in **Figure B.3** and **Figure B.4**) above show, in the vast majority of cases for which it was determinative of the outcome, pass-on has been raised a defence; in more than half of the cases, the court rejected the

³⁴⁷ Note that, of the 10 cases in which pass-on was totally successful, 3 were cases of the French courts in which pass-on was raised as a defence and where the burden of proof was on the claimant to show that they had not passed on the overcharge (i.e. there was a reversal of the burden proposed by the Directive).

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pass-on defence and, in a little less than half of the cases, the court determined that the claimant had passed on the overcharge.

Annex C – Cases reviewed and/or cited

C.1. Cases of the Courts of the European Union

Court of Justice of the European Union
Judgment in <i>Kone and Others</i> , C-557/12, EU:C:2014:1317.
Judgment in <i>Alakor Gabonatermelő és Forgalmazó</i> , C-191/12, EU:C:2013:315.
Judgment in <i>Otis and Others</i> , C-199/11, EU:C:2012:684.
Judgment in <i>Lady & Kid and Others</i> , C-398/09, EU:C:2011:540.
Judgment in <i>Manfredi</i> , C-295/04, EU:C:2006:461.
Judgment in <i>Weber's Wine World and Others</i> , C-147/01, EU:C:2003:533.
Judgment in <i>Courage and Crehan</i> , C-453/99, EU:C:2001:465.
Judgment in <i>Michailidis</i> , C-441/98, EU:C:2000:479.
Judgment in <i>Dilexport</i> , C-343/96, EU:C:1999:59.
Judgment in <i>GT-Link v. De Danske Statsbaner</i> , C-242/95, EU:C:1997:376.
Judgment in <i>Comateb and Others v. Directeur général des douanes and droits indirects</i> , C-192/95, EU:C:1997:12.
Judgment in <i>Tatry v. Maciej Rataj</i> , C-406/92, EU:C:1994:400.
Judgment in <i>Bianco and Girard v. Directeur général des douanes and droits indirects</i> , C-331/85, EU:C:1988:97.
Judgment in <i>Amministrazione delle finanze dello Stato v. San Giorgio</i> , C-199/82, EU:C:1983:318.
Judgment in <i>Just</i> , C-68/79, EU:C:1980:57.
Judgment in <i>Ireks-Arkady v. Council and Commission</i> , C-238/78, EU:C:1979:226.
Advocate General Opinions
Opinion of AG Geelhoed in <i>Commission v. Italy</i> , C-129/00, EU:C:2003:319.
Opinion of AG Mancini in <i>Amministrazione delle finanze dello Stato v. San Giorgio</i> , C-199/82, EU:C:1983:247.
Opinion of AG Mancini in <i>Pauls Agriculture v. Council and Commission</i> , C-256/81, EU:C:1983:91.
Opinion of AG Caporti in <i>Ireks-Arkady v. Council and Commission</i> , C-238/78, EU:C:1979:203.
General Court
Judgment in <i>Ryanair v. Commission</i> , T-342/07, EU:T:2010:280.
Judgment in <i>Hoechst v. Commission</i> , T-10/89, EU:T:1992:32.

C.2. National case-law and cases on pass-on

Country	Name of case	Procedural history
Austria	Payment Cards	Supreme Court, Case No. 4 Ob 46/12m, <i>Payment Cards</i> , judgment of 2 August 2012.
		Higher Regional Court of Vienna, Case No. 5 R 185/10b, <i>Payment Cards</i> , judgment of 4 February 2011.
		Commercial Court of Vienna, Case No. 11 Cg 168/08f, <i>Payment Cards</i> , judgment of 24 June 2010.
	Austrian Federal Railways	Supreme Court, Case No. 7 Ob 48/12b, <i>ÖBB v. Kone, Otis, Schindler and Thyssen Krupp</i> , judgment of 17 October 2012. Higher Regional Court of Vienna, Case No. 1 R 272/11v, <i>ÖBB v. Kone, Otis, Schindler and Thyssen Krupp</i> , judgment of 21 December 2011. Commercial Court of Vienna, Case No. 19 Cg 21/10z, <i>ÖBB v. Kone, Otis, Schindler and Thyssen Krupp</i> , judgment of 19 September 2011.
Belgium	Belgacom v. Base and Mobistar	Brussels Court of Appeal, Case No. 1639/2015, <i>Belgacom SA v. Base Company SA and Mobistar SA</i> , judgment of 26 February 2015.
		Brussels Commercial Court, Case No. A/03/06791, <i>Base and Mobistar SA v. Belgacom</i> , judgment of 29 May 2007.
	Nationale Maatschappij der Belgische Spoorwegen v. Electrabel NV	Brussels Court of Appeal, Case No. 2010/AR/3112, <i>Nationale Maatschappij der Belgische Spoorwegen v. Electrabel NV</i> , judgment of 14 January 2015.
		Brussels Court of Appeal, Case No. 2010/AR/3112, <i>Nationale Maatschappij der Belgische Spoorwegen v. Electrabel NV</i> , judgment of 11 October 2011. Brussels Court of First Instance, Case No. 2009/AR/2765, <i>Nationale Maatschappij der Belgische Spoorwegen v. Electrabel NV</i> , judgment of 20 September 2010.
Denmark	EKKO	Maritime and Commercial Court, Case No. V 15/01, <i>Ekko A/S v. Brandt Group Norden A/S, AM Hvidevarer A/S, GRAM A/S</i> , judgment of 3 October 2002. (" <i>EKKO (2002)</i> ").
	GT-Linen	Supreme Court, Case No. 387/2002, <i>GT Linen A/S V DSB and Scandlines A/S</i> , judgment of 20 April 2005.
		Eastern High Court, Case No. U.2005.2171H, <i>GT Linen A/S v. DSB and Scandlines A/S</i> , judgment of 28 June 2002.
	Cheminova	Maritime and Commercial Court, Case no. U-4-07, <i>Cheminova A/S v. Akzo Nobel Functional Chemicals BV and Akzo Nobel Base Chemicals AB</i> , judgment of 15 January 2015. (" <i>Cheminova (2015)</i> ").

Annex C – Cases reviewed and/or cited

Country	Name of case	Procedural history
France	A) Civil and Commercial Courts	
	<i>Arkopharma</i>	Commercial Court of Nanterre, Case No. 2004F022643, <i>Arkopharma v. Group Hoffmann la Roche</i> , judgment of 11 May 2006. (" <i>Arkopharma (2006)</i> ").
	<i>Juva v. Group Hoffmann la Roche</i>	Commercial Court of Paris, Case No. 2003048044, <i>Juva v. Group Hoffmann la Roche</i> , judgment of 26 January 2007. (" <i>Juva (2007)</i> ")
	<i>DOUX Aliments</i>	Appeals Court of Paris, Case No. 10/18285, Case No. 10/18285, <i>DOUX v. Ajinomoto & CEVA</i>, judgment of 27 February 2014. ("<i>DOUX Aliments (2014)</i>"). Supreme Court (Commercial Chamber), Case No. 09/15816, <i>DOUX v. Ajinomoto & CEVA</i>, judgment of 15 June 2010. Appeals Court of Paris, Case No. 07/10478, <i>DOUX v. Ajinomoto & CEVA</i>, judgment of 10 June 2009. Commercial Court of Paris, Case No. 06/27399, <i>DOUX v. Ajinomoto & CEVA</i>, judgment of 29 May 2007.
	<i>Le Gouessant</i>	Supreme Court, Case No. 11/18495, <i>Le Gouessant v. Ajinomoto & CEVA</i>, judgment of 15 May 2012. Appeals Court of Paris, Case No. 08/08727, <i>Le Gouessant v. Ajinomoto & CEVA</i>, judgment of 16 February 2011. ("<i>Le Gouessant (2011)</i>") Commercial Court of Paris, Case No. 05/063513, <i>Le Gouessant v. Ajinomoto & CEVA</i>, judgment of 22 January 2008.
	B) Administrative Courts	
	<i>SNCF v. Dumez (2009)</i>	Administrative Court of Paris, Case No. 9800111, <i>SNCF v. Dumez e.a</i> , judgment of 27 March 2009.
	<i>SNCF v. Dumez (2008)</i>	Council of State, Case No. 269134, <i>SNCF v. Dumez e.a</i> , judgment of 19 March 2008.
	<i>SNCF v. Sté. Campenon</i>	Appeals Court of Paris, Case No. 05PA03926, <i>SNCF v. Sté. Campenon</i> , judgment of 17 April 2007.

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Country	Name of case	Procedural history
Germany	<i>Vitamin Prices Mannheim</i>	Higher Regional Court of Karlsruhe, 6 U 183/03, <i>Vitamin Prices</i> , judgment of 28 January 2004. Regional Court Mannheim, 7 O 326/02, <i>Vitamin Prices</i> , judgment of 11 July 2003.
	<i>Vitamin Prices Dortmund</i>	Regional Court Dortmund, U 13 O 55/02 Kart, <i>Vitamin Prices Dortmund</i> , judgment of 1 April 2004.
	<i>Deutsche Telekom</i>	Federal Court of Justice, KZR 46/07, <i>Deutsche Telekom</i> , judgment of 29 June 2010. Higher Regional Court Düsseldorf, VI-2 U (Kart) 9/05, <i>Deutsche Telekom</i> , judgment of 27 June 2007. Regional Court Cologne, 91 O 229/04, <i>Deutsche Telekom</i> , judgment of 31 August 2005.
	<i>Ready-mix Concrete</i>	Federal Court of Justice, KZR 45/09, <i>Ready-mix Concrete</i> (pending). Higher Regional Court of Berlin, 2 U 10/03 Kart, <i>Ready-mix Concrete</i> , judgment of 1 October 2009. Regional Court Berlin, 102 O 129/02 Kart, <i>Ready-mix Concrete</i> , judgment of 23 May 2003.
	<i>Carbonless Paper</i>	Federal Court of Justice, KZR 75/10, <i>Carbonless Paper</i> , judgment of 28 June 2011. (" <i>German Carbonless Paper (2011)</i> "). Higher Regional Court Karlsruhe, 6 U 118/05 (Kart.), <i>Carbonless Paper</i> , judgment of 11 June 2010. Regional Court Mannheim, 22 O 74/04, <i>Carbonless Paper</i> , judgment of 29 April 2005.
	<i>Car Glass</i>	Regional Court Düsseldorf, 14d O 4/14, <i>Car Glass</i> , judgment of 19 November 2015. (" <i>German Car Glass (2015)</i> ").

Annex C – Cases reviewed and/or cited

Country	Name of case	Procedural history
Hungary	<i>Construction I</i>	Curia of Hungary, Case No. Gfv.IX.30202/2012, <i>BKV v. STRABAG & others</i>, judgment of 18 September 2012. Metropolitan Regional Court, Case No. 14.Gf.40521/2011, <i>BKV v. STRABAG & others</i>, judgment of 14 March 2012. Supreme Court of the Republic of Hungary, Case No. Pfv.X.20630/2011, <i>BKV v. STRABAG & others</i>, judgment of 19 September 2011. Metropolitan Regional Court, Case No. 14.Gf.40482/2010, <i>BKV v. STRABAG & others</i>, judgment of 16 December 2010. Metropolitan Court, Case No. 5.G.41852/2009, <i>BKV v. STRABAG & others</i>, judgment of 1 July 2010.
	<i>Construction II</i>	Curia of Hungary, Case No. Gfv.VII.30284/2012, <i>NIF v. STRABAG</i>, judgment of 29 January 2013. Metropolitan Regional Court, Case No. 14.Gf.40088/2012, <i>NIF v. STRABAG</i>, judgment of 26 June 2012. Metropolitan Court, Case No. 22.G.40139/2009, <i>NIF v. STRABAG</i>, judgment of 5 November 2009.
	<i>Showtime</i>	Metropolitan Regional Court, Case No. 14.Gf.40057/2013, <i>Showtime Budapest v. Ticketpro</i>, judgment of 18 April 2013. Metropolitan Court, Case No. 22.G.41893/2009, <i>Showtime Budapest v. Ticketpro</i>, judgment of 21 November 2012. ("<u>Showtime (2012)</u>") Metropolitan Regional Court, Case No. 14.Gf.40328/2009, <i>Showtime Budapest v. Ticketpro</i>, judgment of 15 October 2009. Metropolitan Court, Case No. 22.G.40420/2007, <i>Showtime Budapest v. Ticketpro</i>, judgment of 25 February 2009.

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Country	Name of case	Procedural history
Italy	<i>Indaba v. Juventus</i>	Turin Court of Appeal, <i>Indaba Incentive Company S.r.l. v. Juventus FC S.p.A.</i> , judgment of 6 July 2000.
	<i>International Broker</i>	Rome Court of Appeal, Case No. 12332/2003, <i>International Broker S.p.A. v. Raffineria di Roma S.p.A. et al.</i> , judgment of 31 March 2008.
	<i>Libralon</i>	Italian Supreme Court, Case No. 21033/2013, <i>Libralon S.r.l. e Studio Elle S.r.l. v. Agenzia del Territorio</i> , judgment of 13 September 2013. Trieste Court of Appeal, Case No., <i>Libralon S.r.l. e Studio Elle S.r.l. v. Agenzia del Territorio</i> , judgment of 2010.
	<i>Brennercom v. Telecom Italia</i>	Milan Court, Case No. 3054, <i>Brennercom S.p.A. v. Telecom Italia S.p.A.</i> , judgment of 04 March 2014. Milan Court, Case No. 16319/2013, <i>Brennercom S.p.A. v. Telecom Italia S.p.A.</i> , judgment of 27 December 2013. (" <i>Brennercom v. Telecom Italia (2013)</i> ").
	<i>BT v. Vodafone</i>	Milan Court, Case No. 52997/2010, <i>BT Italia S.p.A. v. Vodafone Omnitel n.v.</i> , judgment of 28 July 2015.
The Netherlands	<i>TenneT v. ABB</i>	Arhem-Leeuwarden Court of Appeals, ECLI:NL:GHARL:2014:6766, <i>TenneT v. ABB</i> , judgment of 2 September 2014. District Court Oost-Nederland, ECLI:NL:RBONE:2013:BZ0403, <i>TenneT v. ABB</i> , judgment of 16 January 2013.
	<i>TenneT v. Alstom</i>	District Court of Gelderland, ECLI:NL:RBGEL:2015:3713, <i>TenneT v. Alstom</i> , judgment of 10 June 2015 (" <i>TenneT v. Alstom (2015)</i> "). District Court of Gelderland, ECLI:NL:RBGEL:2014:6118, <i>TenneT v. Alstom</i> , judgment of 24 September 2014.

Annex C – Cases reviewed and/or cited

Country	Name of case	Procedural history
Spain	<i>Spanish Sugar I</i>	Supreme Court, Case No. 5462/2012, <i>Nestlé & ors v. Acor</i> , judgment of 8 June 2012.
		Appeals Court of Valladolid, Case No. 261/2009, <i>Nestlé & ors v. Acor</i> , judgment of 9 October 2009.
		First Instance Court of Valladolid, Case No. 248/2009, <i>Galletas Gullón & ors v. Acor</i> , judgment of 20 February 2009.
	<i>Spanish Sugar II</i>	Supreme Court, Case No. 5819/2013, <i>Nestlé & ors v. Ebro Puleva and ors</i> , judgment of 7 November 2013. (" <i>Spanish Sugar II (2013)</i> ").
		Appeals Court of Madrid, Case No. 370/2011, <i>Nestlé & ors v. Ebro Puleva</i> , judgment of 3 October 2011. (" <i>Spanish Sugar II (2011)</i> ").
		First Instance Court of Madrid, Case No. 59/2010, <i>Nestlé & ors v. Ebro Puleva</i> , judgment of 1 March 2010.
	<i>SEGA v. Repsol</i>	Commercial Court of Madrid, Case No. 140/2013, <i>SEGA v. Repsol</i> , judgment of 19 June 2013.
UK	<i>Sainsbury's MIF Litigation</i>	<i>Sainsbury's Supermarkets Ltd v. MasterCard Incorporated and Others</i> , Case number: 1241/5/7/15 (T), before the Competition Appeal Tribunal (CAT) (pending).
	<i>UK Air Cargo</i>	<i>High Court of England & Wales, Emerald Supplies v. British Airways Plc</i> , HC-2008-000002.
	<i>Electrical Carbon Litigation</i>	<i>Deutsche Bahn & Ors v. Morgan Crucible & ors</i> (Case 1173/5/7/10 before the CAT) (case closed 12 November 2014).
	<i>National Grid</i>	<i>National Grid Electricity Transmission Plc v. ABB Ltd and Others</i> , HC08C03243.
	<i>Cooper Tire</i>	<i>Cooper Tire & Rubber Company Europe Ltd & Ors v. Dow Deutschland Inc & Ors</i> . HC 2007 Folio 1676 and 2008 Folio 703. (" <i>Cooper Tire (2010)</i> ").

C.3. Other national case-law and cases

Germany	<i>DB Barnsdale AG</i>	<i>DB Barnsdale AG v. Deutsche Lufthansa AG and ors.</i> (pending).
Netherlands	<i>Koninklijke Luchtvaart</i>	<i>Koninklijke Luchtvaart Maatschappij N.V. and ors v. Deutsche Bahn AG and ors.</i> (pending).
	<i>Equilib Netherlands</i>	<i>Equilib Netherlands B.V. v. Koninklijke Luchtvaart Maatschappij N.V. and ors.</i> (pending).
UK	<i>Agility CIS</i>	<i>Agility CIS Limited & Ors v. British Airways Plc & Ors</i> (pending).
	<i>Fulton Shipping</i>	<i>Popplewell J in Fulton Shipping Inc v. Globalia Business Travel SAU</i> [2014] EWHC 1547 (Comm).
	<i>Inntreprenneur</i>	<i>Inntreprenneur Pub Company (CPC) and others v. Crehan</i> [2006] UKHL 38.
	<i>Home Department v. Rehman</i>	<i>Home Department v. Rehman</i> [2003] 1 AC 153.

C.4. Non-EU case-law

United States
<i>In re Class 8 Transmission Indirect Purchaser Antitrust Litigation</i> , 2015 U.S. Dist. LEXIS 142717.
<i>In re Optical Disk Drive (ODD) Litigation</i> , 3:10-md-02143, Dkt. 1444 (N.D. Cal. Oct. 3, 2014). (" <i>In re Optical Disk Drive Litigation</i> ").
<i>In re CRT Antitrust Litigation</i> , 3:07-cv-05944-SC Dkt. 1950 (N.D. Cal. Sept. 24, 2013) (" <i>In re CRT Litigation</i> ").
<i>In re TF-TLCD (Flat Panel) Antitrust Litigation</i> , 2012 WL 6709621, at *2 (N.D. Cal. 2012)
<i>In re ATM Fee Antitrust Litigation</i> , 686 F.3d 741 (9th Cir. 2012). (" <i>In re ATM FeeLitigation</i> ").
<i>Clayworth v. Pfizer, Inc.</i> , 49 Cal. 4th 758, 787 (2010)
<i>In re SRAM Litigation</i> , MDL No. 1819, Dec. 14, 2010
<i>In re Graphics Processing Units Antitrust Litigation</i> , 253 F.R.D. 478, 491 (N.D. Cal. 2008) (" <i>In re Graphics Processing Units Litigation</i> ").
<i>Cox v. F. Hoffman-La Roche, Ltd.</i> , 2003 WL 24471996, at *3 (Kan. Dist. Ct. Oct. 10, 2003)
<i>A&M Supply v. Microsoft Corp.</i> , 654 N.W.2d 572, 597 (Mich. 2002). (" <i>A&M Supply v. Microsoft Corp.</i> ")
<i>Weisgram v. Marley Co.</i> , 528 U.S. 440 (2000).
<i>Kumho Rire Co. v. Carmichael</i> , 526 U.S. 137 (1999).
<i>General Elec. Co. v. Joiner</i> , 522 U.S. 136 (1997).
<i>K-S Pharmacies Inc. v. Abbott Labs.</i> , 1996 WL 33323859, at *12 (Cir. Ct. Wisc. 1996)
<i>Daubert v. Merrel Dow Pharmaceuticals, Inc.</i> , 509 U.S. 579 (1993).
<i>California v. ARC America Corp.</i> , 490 U.S. 93 (1989).
<i>Illinois Brick Co. v. Illinois</i> , 431 U.S. 720 (1977). (" <i>Illinois Brick Co.</i> ")
<i>Hanover Shoe, Inc. v. United Shoe Mach. Corp.</i> , 392 U.S. 481 (1968). (" <i>Hanover Shoe, Inc.</i> ").
<i>Hansberry v. Lee</i> , 311 U.S. 32 (1940).
Canada
<i>Sun-Rype Products Ltd v. Archer Daniels Midland Co.</i> , 2013 SCC 58.

Annex D – Insights from economic theory

D.1. Insights from relevant economic theory: direct purchaser effects

D.1.1. Introduction

620. In this annex we consider in more detail some of the insights that relevant economic theory can offer in respect of the damage inflicted on direct purchasers as a consequence of an infringement which raises the affected firm's costs, i.e. results in an overcharge.

621. The damage caused to the direct purchaser by an increase in its costs, brought about by an illegal increase in the price of an input, is made up of three terms:

$$\text{Damage} = \text{Overcharge} - \text{Passing-on effect} + \text{Volume effect}$$

622. As noted in [Section I](#), the passing-on term is obtained by multiplying the increase in the direct purchaser's unit price arising from pass-on of the overcharge by its sales volume, whilst the volume effect is obtained by multiplying the change in sales volume that results from that price increase by the unit margins earned on those sales 'but for' the overcharge (the 'counterfactual margin'). The overcharge itself comprises the change in variable costs multiplied by the observed sales volume, as well as any change in fixed costs.

623. Drawing on the notation set out in Section I.B.2:

$$\text{Overcharge} = q_1 \times (c_1 - c_0) + (F_1 - F_0)$$

$$\text{Pass-on effect} = q_1 \times (p_1 - p_0)$$

$$\text{Volume effect} = (p_0 - c_0) \times (q_1 - q_0)$$

where q denotes the direct purchaser's output, p denotes the price achieved for that output, c denotes the unit cost associated with producing an additional unit of output, and F is the direct purchaser's fixed costs. A subscript 1 refers to observed, i.e. realised values; a subscript 0 refers to counterfactual values.

624. For the remainder of this annex we will follow the economic literature in focussing on overcharges which bring about changes in marginal costs only,

since it is these cost changes which fundamental economic principles suggest are likely to be most immediately relevant to pricing decisions and, therefore, to pass-on. In this case, the overcharge term is simply $q_1 \times (c_1 - c_0)$.

625. **Figure 2** in [Section I](#) above offers an equivalent graphical representation of the components of the overall damage.

626. The changes in price and volume will have opposite signs and if price increases (i.e. $\Delta p = (p_1 - p_0)$ is positive), as would normally be the case in response to a positive overcharge, sales of the product in question will decrease ($\Delta q = (q_1 - q_0)$ is negative).³⁴⁸ The passing-on term $(q_1 \times (p_1 - p_0))$ will, therefore, be positive in this case, whilst the volume effect $((p_0 - c_0) \times (q_1 - q_0))$ will be negative. This means that, whilst passing-on serves to offset at least some of the damage suffered as a result of the initial overcharge, the volume effect works in the opposite direction, augmenting the damage caused by the overcharge. Put differently, the volume effect which accompanies passing-on will at least partially offset the damage-reducing impact of that passing-on effect.

627. The remainder of this annex is organised as follows:

- We will briefly consider the analogies that arise with tax incidence theory, and the relevance to the damages assessment of an oligopolistic market setting.
- Then, we will consider the pass-on rate. This will determine the magnitude of the passing-on effect described above, and the extent to which this offsets the overcharge inflicted on the direct purchaser.
- Finally, we will turn to the additional impact that any increase in prices has via the impact on the direct purchaser's sales volumes.

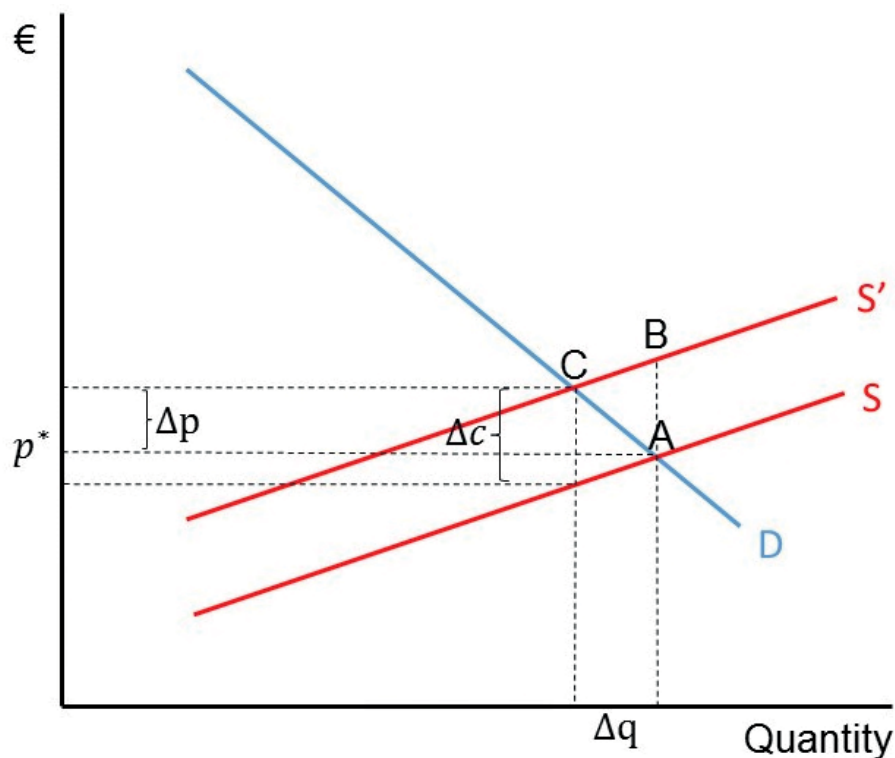
D.1.2. Pass-on in competitive markets and analogies with tax incidence

628. As noted in [Section III.B.4.](#), the question of how the burden – or incidence – of a per unit purchase or sales tax is ultimately divided between buyer and seller provides the classic textbook setting in which pass-on issues have been explored in economics.

³⁴⁸ Conversely, if price would decrease, the volume of sales will typically increase. As a matter of theory, the case in which demand for a product increases as its price increases is possible, but is unlikely to be of practical relevance.

629. To illustrate, consider a market involving downward-sloping demand, D , and upward sloping supply, S . In other words, demand is reduced as the market price increases and expands as the market price falls, whilst market supply does the opposite. This situation is depicted in **Figure D.1** below. The market 'clears' at the price (p^*) at which the quantity demanded matches the quantity supplied (Point A).

Figure D.1: Cost pass-on and the elasticities of demand and supply

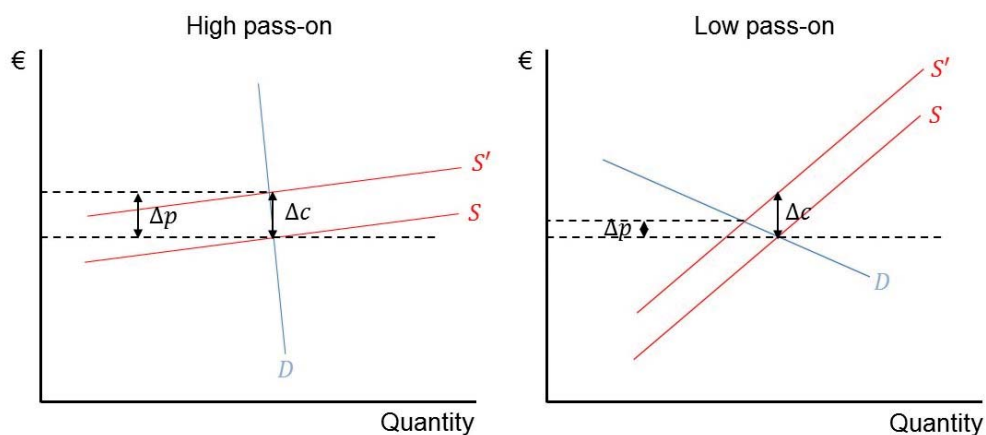


630. Now suppose that there is a market-wide increase Δc in the unit cost of supply. This will cause the market supply curve to shift up vertically; under competitive conditions, by an amount equal to Δc , from S to S' in our diagram. Nevertheless, with downward-sloping demand and upward-sloping demand supply, the market price will increase by less than the amount of the cost increase. (The price increase Δp is evidently less than Δc in the figure above.) In effect, the supply-side of the market absorbs some of the unit cost increase, so that only a fraction of that cost change is passed through to the prices paid by customers. The increase in price will also bring about a reduction in volume (Δq in the figure). The more price-sensitive – or elastic

– is demand, the greater the reduction in volume associated with a given price increase.

631. It is this reduction in volume which causes the pass-on of the cost increase to be incomplete. The upward shift in the supply curve will cause purchases to be more expensive at each level of supply. Indeed, if there were no reduction in the volume demanded, the shift in the supply curve caused by the cost increase would translate fully to an increase in the price paid by customers (Point B in the figure). However, with a downward-sloping demand curve, demand diminishes as price increases. In turn, this results in supply shifting back down the supply-curve and, with it, some offsetting downward pressure on prices. A new market equilibrium is reached where demand intersects with the shifted supply: Point C in the figure. At that point, price is increased compared to the original market equilibrium, but by less than the extent of the unit cost increase. In other words, pass-on is incomplete.
632. In general, the extent of industry-wide pass-on in competitive markets will depend on the relative slopes, or elasticities, of supply and demand. The steeper/less elastic is the demand curve relative to the supply curve, the greater the extent to which the cost increase will be passed through to the customer, as the next figure below illustrates. (See **Figure D.2** below.) Indeed, if the supply curve is perfectly horizontal (i.e. perfectly elastic), the predicted pass-on will be 100%, irrespective of the exact slope/elasticity of demand. Firms are still harmed by the imposition of the tax but, when pass-on is 100%, the adverse effect of the tax is limited to the volume effect. The extent of this effect depends on the elasticity of demand and the margins earned on those lost sales.

Figure D.2: High and low pass-on scenarios



633. It is frequently assumed that there will be 100% pass-on of industry-wide cost changes in competitive settings. The above discussion highlights that this is not necessarily the case. In particular, price-taking behaviour on the part of firms is not sufficient to imply 100% pass-on. Additional conditions are also required, namely that the industry supply curve is horizontal, i.e. perfectly elastic – which is often assumed, or that the industry demand curve is vertical, i.e. perfectly inelastic. In turn, consideration of the underlying economics suggests that this condition requires that the marginal cost of supplying additional units of output is constant, at least at the industry level.
634. Significantly, there are important differences between the economics of pass-on in competitive settings such as the one described above and in imperfectly competitive market environments. In particular, as explained further below, it turns out that pass-on in these oligopolistic environments depends critically on the rate at which the slope of demand changes as output or price changes, i.e. on the curvature of demand, as well its slope or elasticity. Accordingly, the intensity of competition on the market where pass-on is being analysed in a particular competition damages case – and this may vary very considerably from case to case – will influence the potential applicability of the insights discussed above (including the analogies with tax incidence theory) to the assessment of pass-on in competition cases.

D.1.3. The relevance of oligopoly

635. Direct purchasers that are affected by an overcharge may compete in markets that are characterised by imperfect, oligopolistic competition. There are a number of features of competition in such settings that are relevant to the nature and extent of passing-on.
636. First, firms that operate in such markets will generally be aware that their individual actions (e.g. changes in output) are liable to affect market prices. This contrasts with the textbook paradigm of perfect competition, in which firms take the market price as given – i.e. they are price “takers” – in making their output decisions.
637. Second, firms will generally be aware of the interdependence between them and their competitors. Their actions are liable to affect those of their competitors, and vice versa. Moreover, this gives rise to the possibility of strategic interaction; firms taking account of the reactions of their rivals in deciding on their own actions. In this environment, the magnitude of any passing-on of overcharges to prices can be expected to depend not only on the magnitude of the overcharges themselves, but also on how rivals respond to each other’s price or output responses, and so on.

638. The intensity of competition on the downstream market(s) affects the magnitude of the damages arising from a given input price infringement in this context, therefore. Moreover, economic theory predicts that differences in the ways that competitors' behaviour changes in response to changes in their rivals actions can have a significant bearing on market outcomes. In particular, an important distinction arises between scenarios where competitors' actions are so-called strategic substitutes (e.g. firms increasing their own prices in response to an increase in a rival's price) and situations where they are strategic complements (e.g. firms expanding their own sales in response to a rival's contraction). Notable differences arise in these respects between the predictions of the two main paradigmatic models of competition utilised by economists, namely the "Cournot" model (involving quantity setting competition) and the "Bertrand" model (involving price setting competition).
639. Third, the extent to which a direct purchaser and its competitors are affected differently, or similarly, by an overcharge (or the passing-on of an overcharge in the case of indirect customers) may have a significant impact on the resulting market outcomes, and the consequences for the firm in question. Thus, firms that are affected by an overcharge may have to compete with rivals that are not, which will tend to intensify the damage caused to them. Conversely, firms that are not affected when their rivals are may be expected to profit from the overcharge in question. When a firm and its competitors are all affected by the same overcharge, this will tend to dampen the intensity of the competitive interaction between them, reducing the damage caused by the overcharge. Indeed, in extreme cases, economic theory predicts that even affected firms may profit from an overcharge, on account of this competition-dampening effect.

D.1.4. The pass-on rate

640. In general, relevant theory indicates that firms will respond to an increase in their (marginal) costs either by increasing prices directly or by contracting output which, in imperfectly competitive markets, will indirectly lead to an increase in market prices. In imperfectly competitive markets, they will also set different prices (alternatively outputs) if those of their competitors are changed. This means that individual responses to the initial overcharge can also be expected to give rise to additional strategic effects. As detailed further below, in some settings these strategic effects can magnify the extent to which the original overcharge is passed on – notably when rivals respond to pass-on by raising their own prices. In other cases, however, they can dampen the passing-on effect – for example, when rivals expand their sales

in response to a contraction in the affected firm's output. These strategic effects will also influence the damages caused by the overcharge.

Industry-wide versus firm-specific overcharges

641. As explained already, a key distinction affecting the extent of pass-on of overcharges by a firm is that between overcharges which affect that firm only, on the one hand, and overcharges that affect its competitors too, on the other. At the same time, intermediate scenarios in which a sub-set of all competing firms, such as those using a particular technology, are affected by the overcharge – as considered in Verboven and van Dijk (2009), for example – may also be relevant in practice. In reality, different firms may also be impacted differently by a common, industry-wide overcharge too.
642. More generally, a price infringement might give rise to a range of different overcharge effects, e.g. depending on the production technologies that individual firms use, the extent of so-called “umbrella” effects involving other suppliers, etc. Hence, the ‘equilibrium’ impact of an overcharge may be very complex indeed in practice.
643. Many economic models show firms passing on firm-specific cost changes to a (much) smaller extent than they would in the case of industry-wide cost changes. The intuition for this is straightforward. An individual firm is constrained in the extent to which it can profitably pass on a cost increase by the competition it faces from rival suppliers. The constraint posed by these rivals will be weaker if they are also subject to increased costs.³⁴⁹
644. A given firm's pricing (alternatively output) decisions may be affected by the cost-raising effects of an overcharge directly – because its own costs are increased – and/or indirectly – because the behaviour of (some of) its rivals on the downstream market is affected by increases in their own costs. (Hellwig (2006) discusses the issues this potentially raises for the attribution of harm.) Similarly, a given overcharge may lead to an increase as well as a reduction in a firm's sales, depending on how it and its competitors are affected. In all cases, the magnitude of any effects will depend on the strategic reactions of competitors.

³⁴⁹ As is discussed further below, if Firm B (a rival of Firm A) faces a cost increase, Firm B may increase price and thereby cause demand to increase for Firm A's product (all else equal). This will mean that Firm A has greater scope to pass on its own cost increase.

Relevant cost measure

645. The relevance for passing-on of the distinctions between various categories of cost has been highlighted in Section III of the report. It is not considered further here, therefore.

The impact of competitive intensity on passing-on

646. Economic theory indicates that the intensity of the competitive rivalry between downstream firms is likely to have a key influence on the extent to which overcharges are passed through to prices.
647. It is most straightforward to consider this in a homogeneous goods market setting. In such a setting, competition can range from textbook “perfect” competition, at one extreme, to monopoly at the other. However, homogeneity means that there is limited scope for competing firms to maintain different prices ‘in equilibrium’. Instead, a single market price prevails. In this case, pure price competition is liable to deliver the perfectly competitive outcome whenever there is more than one firm in the market.³⁵⁰ Nevertheless, oligopolistic market outcomes can be sustained through quantity-based competition with homogeneous goods. These outcomes can be modelled using the standard ‘Cournot’ model of quantity-based competition, which is one of the workhorses of economic analysis.
648. When there is only a single market price, the price effects of any overcharges – whether they affect individual or multiple firms in the market – must be channelled via that single price. In other words, any passing-on effects will apply equally to all firms in the industry.

Pass-on of industry-wide overcharges

649. The use of some notation allows the pass-on effects of industry-wide (marginal) cost changes in a range of competitive settings to be represented using a single formula. Specifically, suppose that the intensity of competition is captured by a parameter θ , which ranges from 0, in the case of textbook perfect competition, to 1, under monopoly. In other words, smaller values of θ correspond to more intensely competitive markets. Specific intermediate values of this parameter also allow pass-on rates for particular

³⁵⁰ That allows limited scope for the market to sustain more than one firm under homogeneous ‘Bertrand’ price competition if fixed costs or (even small) differences in marginal costs are relevant factors. In theory, outcomes with prices above marginal costs might be sustainable if firms were subject to capacity constraints. However, the results of relevant theory are highly technical and not easily translated into practical insight.

models of oligopolistic competition to be represented too.^{351,352} For example, for symmetric Cournot competition, θ is equal to the inverse of the number of firms, N , active on the market; i.e. $\theta = 1/N$.

650. The absolute pass-on rate for an industry-wide change in marginal cost can then be expressed as:³⁵³

$$\tau = \frac{dp}{dc} = \frac{1}{1 + \theta(1 + \varepsilon_{sid}) + c''}$$

where ε_{sid} – the elasticity of the slope of inverse demand – is a measure of the curvature of demand (see further below),³⁵⁴ and c'' is the rate at which marginal cost changes as output increases, i.e. the slope of the marginal cost curve.

651. The formula indicates that passing-on will generally be greater in more competitive market environments. Specifically, provided demand is not too convex – specifically, that ε_{sid} is not more negative than -1, pass-on of industry-wide overcharges will be greater for smaller values of θ , i.e. scenarios in which competition is relatively intense. To see this, observe that the denominator in the formula will be greater, implying a smaller pass-on rate, all else being equal, for larger values of the competition parameter θ , provided the term in brackets is positive, i.e. ε_{sid} is not more negative than -1.

652. For example, with constant marginal costs ($c'' = 0$) and $\varepsilon_{sid} = -\frac{1}{2}$, the pass-on rate will be 66% if $\theta = 1$, 80% if $\theta = \frac{1}{2}$, and 100% if $\theta = 0$. Similarly, if $\varepsilon_{sid} = 1$, the pass-on rate will be 33% if $\theta = 1$, 50% if $\theta = \frac{1}{2}$, and 100% if $\theta = 0$.

³⁵¹ The formula also applies in respect of symmetric settings with differentiated Bertrand competition, for example, as discussed further below.

³⁵² Notably, a number of contributions to the theoretical literature in this area have implemented so-called conjectural variations, which allow a wide range of assumptions regarding the anticipated strategic responses of competitors to be modelled. In turn, these allow more continuous variation in the intensity of competition, represented by a broader range of values of the competition parameter θ . Nevertheless, there is much debate regarding the validity of conjectural variations assumptions and the interpretation – if any – that one can give to results obtained across the full range of parameter values.

³⁵³ Theoretical analysis of cost pass-on has focussed on the effects of infinitesimally small cost changes. This, usefully, allows the tools of differential calculus to be deployed, as here. However, it is important to be aware that some specific insights may not carry over to more substantial 'real world' overcharges.

³⁵⁴ Technically, it is the percentage change in the slope of demand arising from a 1% increase in quantity.

0. With sufficiently convex demand, i.e. sufficiently negative ε_{sid} , the pass-on rate can even exceed 100%.³⁵⁵
653. This result applies more generally to situations with constant but not necessarily symmetric marginal costs.³⁵⁶ To illustrate these various effects, consider a market with linear demand served by identical firms with constant marginal costs that displays the textbook conditions of perfect competition. In this case, if marginal cost increases by €1 for all firms, then the supply curve shifts upwards by the same amount and - because the supply curve is flat - so must the market price. In other words, there is full pass-on. In the formula, with θ equal to 0, the pass-on rate is 100%. If, instead, this market with linear demand ($\varepsilon_{sid} = 0$) were monopolised ($\theta = 1$), the pass-on rate would be 50%.³⁵⁷ In fact, the formula indicates that the monopolist will increase its price by *less* than the €1 cost increase - i.e. the rate of passing-on will be less than 100% - unless demand is very convex.
654. Note, therefore, that even a monopolist can be expected to adjust its price in response to a change in (marginal) costs. In doing so, the monopolist will, as described above, balance the margins lost through a reduced volume of sales with increased margins on remaining sales. In the intermediate case of oligopolistic Cournot competition, the competition parameter θ is inversely related to the number of firms. Hence, this parameter converges on 0 - i.e. the case with perfect competition - as the number of firms becomes large, and on 1 - i.e. the monopoly case - as the number of firms diminishes.
655. Provided demand is not too convex (see **Figure D.3** below for an illustration), the predicted rate at which industry-wide overcharges are passed on increases as the number of firms on the downstream market increases. With linear demand and constant marginal costs, pass-on ranges between 50% and 100%, as the number of competing firms increases.
656. The formula also indicates that the more upward-sloping the marginal cost curve is (the more positive is c'') the smaller will be the rate of pass-on. Conversely, a downward-sloping marginal cost curve (c'' negative) will increase the rate of passing-on compared to the constant marginal cost case.

³⁵⁵ If the value of ε_{sid} is more negative than -1, then the denominator in the pass-on expression will be less than 1, implying a pass-on rate of more than 100%.

³⁵⁶ It can be seen that the pass-on rate increases as θ increases provided that $\varepsilon_{sid} > -1$. (Firms need not have the same level of (constant) marginal cost in this scenario.) As noted above, there is much debate as regards how one might interpret values of θ outside of specific cases settings.

³⁵⁷ The pass-on rate will be smaller than this with concave demand and greater with convex demand, other things being equal.

Study on the Passing-on of Overcharges

Pass-on of firm-specific overcharges

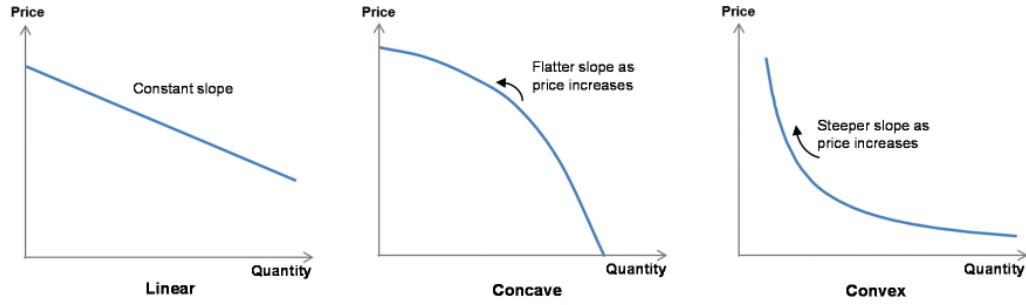
657. By definition, there is no distinction between firm-specific and industry-wide cost changes in monopoly settings. At the other extreme, the textbook model of “perfect” competition supposes that all firms are price takers. In other words, they are assumed to behave as if their actions have no impact on market prices. Moreover, the atomistic market structure that is also assumed in the textbook formulation ensures that there will be no change in the market price even if an individual firm responds to an increase in its costs by reducing its output. It follows that there will be no pass-on of firm-specific cost changes in such an environment.
658. More generally, an individual firm’s response to a firm-specific overcharge will affect the (single) price received by all firms supplying the homogeneous good in question. Specifically, the affected firm can be expected to respond to an increase in its marginal costs by reducing its output, thereby increasing the market price, all else being equal. However, the overall price effect will depend on the output decisions of all firms, and how the decisions of individual firms interact. When only one firm is affected by the cost change, other firms will not face the same incentive to cut output. Indeed, in a ‘Cournot’ setting with quantity competition, those other firms will expand their individual outputs given the output-cutting response of the affected firm, albeit not by so much as to offset that reduction by the affected firm. These competitor ‘reactions’ will, therefore, dilute the output-contracting, price-increasing aggregate effect of the overcharge compared to the impact of the directly affected firm’s individual response. The impact of these competitor effects in practice will depend on market parameters and is an empirical question.
659. Where a homogeneous goods industry is characterised by ‘Cournot’, quantity-setting competition among firms with constant (i.e. volume invariant) marginal costs, the single market price is a function of the simple industry average marginal cost, i.e. the sum of marginal costs in the industry, divided by the number of firms in the industry. Thus, if the marginal cost of only one of N firms is affected by a €1 overcharge, the impact on the industry average marginal cost will be $\frac{€1}{N}$ - $\frac{1}{N^{\text{th}}}$ of the impact that a €1 overcharge affecting all N firms would have. Moreover, strikingly, the extent of the pass-on of such a firm-specific cost increase will be $\frac{1}{N^{\text{th}}}$ that of an equivalent industry-wide cost change (irrespective of the relative sizes of the firms in question).
660. The pass-on of firm-specific cost changes can also be expected to be smaller the greater is the number of firms in the market. Intuitively, as the number

of firms increases, the industry becomes more like a perfectly competitive one where, as discussed above, firm-specific pass-on is 0.

The relevance of demand curvature

661. As indicated by the formula reported above, theory indicates that the extent to which an overcharge will be passed on to prices will also depend on the shape of demand. Significantly, in markets characterised by imperfect competition, the curvature of demand as well as its slope (or its elasticity) is relevant in this respect. The curvature of demand is the rate at which the responsiveness of demand to price changes – i.e. the slope of the demand curve – varies as price (or output) changes.
662. The intuition for the relevance of curvature is as follows. Economic principles indicate that a profit-maximising firm will choose price and/or output so that marginal revenue equals marginal cost. In imperfectly competitive situations, the resulting outcome is a price which is a function of the slope or, equivalently, the elasticity of demand. When marginal cost changes, the resulting change in price depends on the rate at which the slope of demand changes, i.e. on the curvature of demand.
663. If the demand curve is linear, it has zero curvature. If it is convex, the curvature and slope elasticity will be negative; if it is concave, they will be positive. Thus, in the case of convex demand, the quantity demanded becomes less sensitive to a given change in prices as price increases. In other words, if the demand that remains at increasingly high prices is increasingly price insensitive, that traces out a convex demand relationship. Conversely, with concave demand, the demand that remains as price increases becomes increasingly sensitive to changes in price. Put differently, in this case, the greater the quantity that is already consumed, the greater the price reduction required to encourage a given amount of additional consumption.
664. Many demand functions commonly used in economic analysis – such as constant elasticity demand, almost ideal demand (AIDS), and logit demand – exhibit convex curvature properties.

Figure D.3: Demand curvature



665. As the formula described above indicates, for a given intensity of competition, pass-on of industry-wide cost changes will be greater the more convex (or less concave) is demand. Indeed, if demand is sufficiently convex, pass-on rates may exceed 100%. To see this, observe that a more negative value of ε_{sid} , corresponding to more convex demand, implies a smaller denominator in the pass-on formula. In turn, that implies a greater pass-on rate.³⁵⁸

666. For example, if $\theta = \frac{1}{2}$, say, then the industry-wide pass-on rate (with constant marginal costs) will be:

- 50% if $\varepsilon_{sid} = 1$, i.e. demand is concave,
- 66% if $\varepsilon_{sid} = 0$, i.e. demand is linear; and
- 80% if $\varepsilon_{sid} = -\frac{1}{2}$, i.e. demand is convex.

667. The relevance of the curvature of demand to the magnitude of the pass-on rate has significant practical implications. That is because the specifications of demand that are usually adopted in demand estimation work do not allow the curvature to vary freely (and, therefore, to be determined empirically). Rather, the process of demand estimation typically starts with the adoption of a particular form of demand, which then dictates the curvature.³⁵⁹ For example, if a linear specification of demand is adopted, this will imply zero curvature. Furthermore, our research has indicated that there has been very

³⁵⁸ In this case, the adjustment in response to the cost increase may bring about a relatively substantial price increase in relation to the associated volume decrease. (See the right-most panel of **Figure D.3**). As a consequence, profits may actually be increased as a result of the overcharge. However, this is likely to be a rather exceptional scenario in practice.

³⁵⁹ See, for example, the discussion in [Section IV.B.6](#).

little investigation of the curvature of demand that pertains in particular market settings in practice.

668. This lack of a measure of actual demand curvature imposes potentially severe limitations on the extent to which theory alone can be used to arrive at a reasonably precise measure of the pass-on rate in practice. Put differently, if the pass-on predictions of theory depend sensitively on the curvature of demand, and a measure of relevant curvature is not available – and, typically, it is not – then the precision with which theory alone can provide insight into pass-on rates in practice may be rather limited.
669. The practical implications of this limitation are sensitive to the intensity of competition, as illustrated further in **Box D.1** below. In highly competitive markets, the curvature of demand will have a relatively limited impact on the pass-on rate for industry-wide overcharges. At the other extreme, the curvature of demand is liable to have a more significant influence on pass-on the less competitive is the market environment.³⁶⁰
670. An illustration of the sensitivity of the rate of pass-on to demand curvature is set out in **Box D.1** below:

Box D.1: The sensitivity of pass-on rates to demand curvature

The previous discussion has highlighted the relevance of the curvature of demand to the pass-on rate. As noted, however, this is a parameter that is rarely available in practice. In response, experts in some cases have proceeded by assuming (possibly implicitly) that $\varepsilon_{sid} = 0$; i.e. that demand is linear. This delivers the attractively simple prediction that the pass-on rate will range from 50%, in monopoly situations, to 100% with perfect competition. Nevertheless, it is worth considering for a moment the potential error that might be introduced by assuming linear demand when it is, in fact, non-linear.

Suppose that the true curvature of demand implies $\varepsilon_{sid} = 1$. In this case, assuming linear demand ($\varepsilon_{sid} = 0$) will lead to erroneous estimates of the pass-on rate. Drawing on the formula set out above, it is evident, for example, that:

- in the monopoly case, this will result in an estimated pass-on rate for industry-wide overcharge of 50%, when the true value is 33%; and
- in a ten firm homogeneous goods market displaying 'Cournot' characteristics, the estimated pass-on rate for an industry-wide overcharge will be 91%, when the true value is 83%.

In other words, if demand is actually concave, assuming linearity will result in an overstatement of pass-on. Conversely, if demand is actually convex, then assuming linearity will understate the extent of pass-on. Significantly, the less intense the competition in a market, the greater the error associated with assuming linear demand.

³⁶⁰ To see this, note that the influence of demand curvature (as captured in the ε_{sid} measure) on the denominator of the pass-on formula will depend on the value of the competition parameter, θ , too. If $\theta = 0$, i.e. the market is highly competitive, then the ε_{sid} term will disappear. It will have greatest weight when $\theta = 1$, i.e. in monopoly settings.

The impact of product differentiation

671. Product differentiation gives rise to a lessening of the intensity of competitive rivalry, all else being equal. Hence, in differentiated product settings, there may be scope for competing firms to set different prices and still secure positive sales. In other words, oligopolistic outcomes can be sustained with competition in prices, as captured by the so-called 'Bertrand' model often adopted by economists.³⁶¹ In this environment, there is scope for pass-on to affect the prices of different firms differently. This includes 'cross' effects, whereby a firm-specific overcharge affecting one firm results in increases in the prices of rival firms too. The more differentiated the market environment, the less sensitive firms will be to the actions of their rivals.
672. Economic theory indicates that the same key factors will influence passing-on in this context as in the homogeneous goods setting, namely the intensity of competition, the curvature of demand, and the manner in which marginal costs change as output levels change, i.e. the slope of the relationship between marginal cost and output. However, the nature and extent of differentiation can have a significant influence on the intensity of competition delivered by the rivalry between a given number of firms, as well as the impact of a more or less concentrated market.

Industry-wide overcharges

673. The formula identified previously (in the homogeneous goods context) can also describe the pass-on of industry-wide cost changes when symmetric, single product firms are engaged in differentiated 'Bertrand' competition in prices.³⁶² This can be achieved by setting the competition parameter θ equal to $1 - D$, where D is the aggregate diversion ratio. In terms of the formula identified previously:

$$\tau = \frac{dp}{dc} = \frac{1}{1 + (1 - D) \cdot (1 + \varepsilon_{sid})}$$

674. D is the proportion of the sales that a firm would lose if it increased its price which would be diverted in aggregate to all the other firms in the market, so $1 - D$ is the proportion of those lost sales that would be diverted outside the

³⁶¹ As noted, it is also possible to model differentiated products competition using Cournot assumptions.

³⁶² Symmetry in this context means that all firms have the same production technology and are equally differentiated from each other (so no single product is particularly close to any one other in terms of substitutability). As a consequence, all firms charge the same price 'in equilibrium', even though products are differentiated.

market as a whole.³⁶³ The more differentiated the market, and the closer the position of each firm to a monopoly, the smaller the proportion of sales lost by the firm that will be diverted to rivals. In that case, the value of D will converge towards 0 and, if demand is linear ($\varepsilon_{sid} = 0$), the formula indicates a pass-on rate of 50%; i.e. the monopoly level.

675. The previous insight that pass-on of industry-wide cost changes will be greater for smaller values of the competition parameter carries over to this differentiated setting; again, provided that demand is not too convex.³⁶⁴ The more intense is the competition between firms on a market, the greater the proportion of sales lost by one firm in response to an increase in its price that will be diverted to rival firms. In other words, the greater the aggregate diversion ratio, D , the smaller the value of θ . A reduction in the degree of differentiation between firms can be thought of as leading to a greater intensity of competition. Hence, the pass-on of industry-wide overcharges is predicted to increase as the extent of product differentiation is reduced and the intensity of competition increases as a result.

Firm-specific overcharges

676. When differentiated product competition is characterised by 'Bertrand' competition in prices, a firm will respond to a firm-specific increase in its costs by setting a higher price. Moreover, rivals can be expected to take account of the affected firm's changed price by setting higher prices too in this case.³⁶⁵ However, they will typically do so by a lesser amount than if their own costs had also been increased to the same extent. This means that, in equilibrium, the effect of the initial firm-specific cost increase on the affected firm's own price will be reinforced. It also implies a distinct 'cross' pass-on effect, whereby even a firm-specific increase in one firm's costs will cause rivals' prices to increase too.
677. To illustrate, consider a symmetric duopoly. Suppose that if Firm 1's marginal cost were to increase by €1, it would increase its price by €0.70, all else being equal. Firm 2 would then also increase its price in this case. It could do so profitably because Firm 1 now presents a weaker competitive constraint. Another way to think about this is that Firm 1's price increase

³⁶³ One practical implication is that (provided symmetry is a reasonable assumption), if one had a reliable estimate of pass-on (e.g. obtained from econometric estimation) as well as evidence on the aggregate diversion ratio (e.g. from survey evidence) then one can recover an estimate of the elasticity of the slope of inverse demand.

³⁶⁴ This assumes constant marginal costs and that the conduct parameter is independent of the level of output and this result is not necessarily robust to relaxing those assumptions.

³⁶⁵ In the new market equilibrium that follows, each competitor's prices can be expected to take account of – and maximise profits given – the (changed) prices of all its rivals. Thus, the affected firm's profit maximising price will increase further given its rivals' higher prices.

will divert demand to Firm 2 and, in response to that higher demand, Firm 2 will increase its price.³⁶⁶ Firm 2's price increase will also tend to reinforce the original pass-on incentive for Firm 1. Firm 2, however, would typically not increase its price by as much as Firm 1, or by as much as if it had also experienced the same increase in its own costs.

678. With quantity-based competition between suppliers of differentiated products, relevant theory identifies different strategic effects.³⁶⁷ A firm will typically respond to an increase in its own costs by reducing output, thereby raising its price. This effect is the same as with price-based competition, albeit output rather than price is the choice variable. This would also have a positive effect on the prices achieved by its rivals, all else equal. Again, this is the same as would occur with price-based competition, as described previously. However, with quantity-based competition under 'Cournot' assumptions, the response of rivals to this will be to expand their own outputs. Such expansion will apply downward pressure to prices, both for these firms and for the firm originally affected by the overcharge. The predicted net effect is still an increase in all prices on the market, i.e. positive pass-on. However, the extent of this pass-on will be moderated, all else being equal, as a result of the strategic effect operating in the opposite direction; by how much in a given setting is an empirical question.

679. Relevant economic theory suggests that the interaction between these effects can be quite complex. For example, the specific differentiated, linear Cournot model considered by Zimmerman and Carlson (2010) yields a non-monotonic relationship between the rate of firm-specific cost pass-on and the number of firms in the market, with pass-on first decreasing as the number of firms increases, then increasing as the number of firms increases above a certain threshold. The intuition for this is that the output decisions of any one firm will have an increasingly small impact on the output decisions of rivals in Zimmerman and Carlson's set-up as the overall number of competing firms becomes large.³⁶⁸ Hence, rivals will expand their outputs by less in response to the output reduction of a firm affected by firm-specific overcharge when there are more competitors on the market. As a result, this dampening effect of such output expansion on pass-on will be reduced. Beyond a certain point, this consequence of an increased number of firms outweighs the continuing pass-on reducing impact of increased competition.

³⁶⁶ In technical terms, prices are normally modelled as so-called strategic complements - Firm 1's best response to a higher price set by Firm 2 is also to increase its price (and vice versa).

³⁶⁷ Whereas prices are (usually) so-called strategic complements - a firm will have an incentive to increase its own price as rivals' prices increase, quantities are (usually) so-called strategic substitutes - a firm will have an incentive to increase its output if a rival *reduces* its output.

³⁶⁸ This is because it will have an increasingly small impact on those rivals' prices.

680. Nevertheless, even in Zimmerman and Carlson’s model this result disappears as products become undifferentiated, converging on the homogeneous goods outcome in which firm-specific pass-on decreases monotonically as the number of firms in the market increases (see the previous sub-section).³⁶⁹ Furthermore, the non-monotonicity does not prevail when a version of Zimmerman and Carlson’s model involving ‘Bertrand’ price competition is considered. In this case, as noted, the strategic effect reinforces the initial pass-on response of the affected firm. In other words, both the direct and strategic effects work in the same direction. As the number of firms on the market increases, the intensified competition effect and the diminished strategic effect therefore both contribute to a reduction in pass-on.

681. Hence, in differentiated product settings, economic theory indicates that there is no general relationship between market structure and the degree of pass-on of firm-specific overcharges.³⁷⁰

D.1.5. The effects of marginal costs that change with the level of output

682. Much of the theoretical literature addressing cost pass-on treats marginal costs as being constant.³⁷¹ In other words, a firm’s marginal costs are assumed not to change as the level of output it produces changes.

683. If, instead, firms have marginal costs which increase with the level of output, giving rise to an “upward-sloping” marginal cost curve, then pass-on can be expected to be reduced compared to the constant marginal cost case. The intuition for this is as follows: If firms face a shift upwards in these upward-sloping marginal cost schedules as a result of an overcharge, then the first order response is to reduce output directly or to increase price, which will reduce sales. However, if marginal costs decrease as output decreases, so doing moves the firm to a position at which the level of marginal costs is reduced. This mitigates (part of) the cost-raising effect of the overcharge, reducing the extent of pass-on compared to the constant marginal cost case.

684. This intuition also underpins the well-known insight from the tax incidence literature that a tax increase will be borne primarily by the demand side of the market when supply is relatively elastic compared to demand, and by the supply-side when supply is relatively inelastic.³⁷² Competitive supply will be

³⁶⁹ Strategic effects also become increasingly irrelevant as the market becomes increasingly differentiated and individual firms increasingly resemble local monopolists.

³⁷⁰ For example, Stennek and Verboven (2006) considers absolute firm-specific pass-on in the logit model in terms of the impact of a firm-specific cost shock on not only the own price of that firm but on all prices within the market (i.e. all inside goods) weighted by their respective outputs. It finds that there is not a simple relationship between a firm’s market share and the degree of pass-on.

³⁷¹ An exception is Weyl and Fabinger (2013).

³⁷² See the discussion in [Section D.1.2](#) above.

inelastic if marginal costs at the industry level decrease rapidly with decreases in output, giving rise to dampened pass-on.

685. Conversely, if there are increasing returns to scale (such that the marginal cost schedule slopes downwards as output increases), this is likely to amplify pass-on effects. As above, the immediate response to the cost change is to increase price thereby reducing output (or vice versa). In this case, however, by raising marginal cost still further, the 'feedback effect' that results from an output reduction will magnify the original increase in prices.

D.1.6. Pass-on and buyer power

686. In some market settings, buyer power acts as a constraint on the pricing power of suppliers. In this context it might at first be supposed that the extent of pass-on would invariably be limited whenever buyers have significant negotiating power. However, economic theory suggests this will not necessarily follow. Much depends on the specific detail of particular individual negotiations, and the context in which they take place. Case-by-case consideration of these factors is, therefore, warranted.
687. Buyer power derives from the relative bargaining strength of the buyer in its negotiations with the supplier. In turn, that depends on the buyer being relatively more able and willing to 'walk away' from negotiations than the supplier. Most obviously this would be the case if the buyer could easily switch to an alternative source of supply, providing it with a credible, strong 'outside option' in the negotiations. It could also arise if the buyer could be more patient; that is, if it would find a delay in reaching agreement less costly than would the supplier. For example, the negotiations in question might relate to a small fraction of the buyer's business but may be critical to the supplier's business. In that case, the supplier may be subject to far greater pressure to conclude a deal with the buyer quickly than vice versa.

The parameters of the negotiation

688. At their simplest, negotiations between a buyer and a seller will focus on the unit price at which products or services will be traded. This provides the most straightforward setting in which to assess the implications of buyer power for passing-on, and for damage quantification more generally. However, buyers and sellers may also negotiate over the terms of more complicated contracts. These terms could include fixed fees, volume discounts, and commitments to minimum purchases, for instance, as well as restrictions on the way the buyer uses the products in question, including

agreements in relation to the buyer's own pricing conduct.³⁷³ The scope of these negotiations can have substantial implications for passing-on and damages.

Efficient bargaining

689. Many contributions to the economic literature on buyer power suppose that bargaining between buyer and seller will be efficient. In other words, the buyer and seller will agree on an arrangement which maximises their expected joint profit, and negotiation will focus on the division of this maximised joint surplus.
690. For example, in a setting where buyer and seller negotiate over both a per unit charge and a fixed fee, efficient bargaining would imply a unit charge that reflected the marginal cost of supplying that unit, with bargaining regarding the division of profit focussed on the level of the fixed fee. In this context, the negotiations could be expected to result in 100% pass-on of any changes in the supplier's marginal costs to the unit charge, irrespective of the relative bargaining strengths of the buyer and seller.
691. The increase in the unit charge which results from such pass-on will lead to a reduction in the supplier and buyer's joint profits – because, as explained above, this will result in the buyer's downstream margins being squeezed, or a reduction in sales volumes, or a combination of these effects. However, the distribution of the resulting damages between the buyer and the supplier will also depend on how negotiation of the fixed fee responds to this. If the buyer can secure an unchanged absolute profit in its negotiation with the supplier, e.g. because this is pegged to an 'outside option' which is unchanged, then the full weight of the combined damage to buyer and seller will fall on the supplier. On the other hand, if the fixed fee is unchanged, then the buyer will bear the adverse effect in full. If the fixed fee is adjusted to maintain the distribution of profit between the buyer and supplier then both will suffer damage.
692. Hence, even where there is full pass-on of the unit overcharge, the distribution of damages will be determined by the outcome of the specific negotiations over the fixed fee conducted between the buyer and supplier. Particular caution must be exercised in such settings to avoid presuming full pass-on, on account of the impact on the unit charge, when opposite effects on the fixed fee component may result in the supplier continuing to bear effects of the overcharge.

³⁷³ Some forms of agreement of this sort would infringe competition laws, of course.

693. As noted, subject to legal constraints, a buyer and supplier might maximise their combined profit by negotiating not only over the wholesale charge but also the final prices set by the buyer on the downstream market.

Bargaining over a unit wholesale price

694. If negotiations between the buyer and supplier are focussed on the unit wholesale charge only, the framework for damages assessment set out previously is relevant, notwithstanding that the detail of the bargaining process may affect the level of the unit charge and, therefore, the extent of overcharge pass-on by the supplier.

695. Such bargaining is liable to take account of the effect that the wholesale price will have on the buyer's own downstream pricing behaviour. Specifically, if a high wholesale price will be passed through to downstream prices, the effect of this on sales at the upstream and downstream levels will factor into the negotiations. The supplier will negotiate less aggressively over the wholesale price if the benefits of a higher price and margin will be offset by the adverse effect that the pass-on of a higher price by the buyer will have on sales volumes.³⁷⁴

696. These considerations are predicted to affect the extent to which a change in the supplier's costs is passed through to the wholesale price. Holding all else constant, an increase in those unit costs will reduce the combined margins available to the buyer and the seller. The extent to which this change is reflected in the wholesale price will therefore depend on the division of those margins that emerges from negotiations.

697. As noted, a further consideration is the effect that a change in the wholesale price will have on the purchaser's own pricing behaviour. The relevant issue then concerns the rate at which the downstream firm's pass-on rate changes as the wholesale price is increased. The greater the rate of increase in that pass-on rate, the less the overcharge will be reflected in higher wholesale prices (all else held constant).

Negotiated price determined by external constraints

698. In some settings, the outcome of a buyer's price negotiations with a given supplier will be determined by the buyer's ability to switch to an alternative source of supply if those negotiations fail. In other words, the outside option will fix the price paid by the buyer. If that alternative source of supply is not affected by the infringement, then the outcome of the bargaining process will

³⁷⁴ A supplier choosing its price unilaterally would do the same.

not change either. In that case, where the buyer and the supplier bargain over the unit charge, that unit price will be unaffected by the overcharge. In other words, there will be zero pass-on.

699. In other settings, of course, the outside option may also be affected by the overcharge. Indeed, it is possible that in some situations only the outside option will be affected. In that case, the prices of transactions between parties that are not affected directly by the infringement may be affected indirectly, via the impact of these outside options on their negotiations (see the discussion of ‘cross’ and umbrella effects above).

D.1.7. Summary

700. The following tables summarise the predictions of relevant economic theory in respect of pass-on of industry-wide and firm-specific overcharges respectively. As noted elsewhere however, careful consideration of the realities and practices of the market at hand is required in assessing the relevance of these findings to a specific case.

Industry-wide overcharge

Table D.1: Pass-on of industry-wide overcharges: predictions of relevant theory

Influence	Effect
Relevant cost	Only changes in marginal (variable) costs will usually be passed on in the short term. Overcharges affecting fixed costs may have longer term pass-on effects.
Intensity of competition	Pass-on rates will increase with the intensity of competition so long as demand is not too convex
Product differentiation	Differentiation will dampen the intensity of competition, generally reducing pass-on effects
Curvature of demand	Pass-on in imperfectly competitive markets depends on the curvature of demand. It will be greater the more convex is demand.
Variation of marginal cost with output	If marginal costs increase with the level of output, pass-on rates will be reduced. The reverse will hold if marginal costs decrease with the level of output.
Buyer power	Effects are likely to depend on the specifics of the negotiating environment
Longer term considerations: entry and exit	Where overcharges cause some firms to exit the market, the extent of pass-on will be reduced. The scope for profit-increasing pass-on will be reduced.

Firm-specific overcharges

Table D.2: Pass-on of firm-specific overcharges: predictions of relevant theory

Influence	Effect
Relevant cost	Only changes in marginal (variable) costs will usually be passed on in the short term. Overcharges affecting fixed costs may have longer term pass-on effects nevertheless.
Intensity of competition	Pass-on rates will tend to decrease with the intensity of competition
Product differentiation	The effects of differentiation are ambiguous. The effects of decreasing market concentration may be non-monotonic.
Curvature of demand	Pass-on in imperfectly competitive markets depends on the curvature of demand. It will be greater the more convex is demand.
Variation of marginal cost with output	If marginal costs increase with the level of output, pass-on rates will be reduced. The reverse will hold if marginal costs decrease with the level of output.
Buyer power	Effects are likely to depend on the specifics of the negotiating environment
Longer term considerations: entry and exit	The affected firm may choose to exit the market, increasing pass-on effects. However, differential effects may also encourage entry by firms that are subject to no/smaller overcharge, which may offset this.

D.1.8. Taking account of the volume effect

701. Where the initial overcharge is passed on (at least partially) to the direct purchaser's own prices, this will generally cause its sales to be reduced, all else being equal. As a result, the margins which would otherwise have been earned on those sales will be lost, contributing to the damage suffered. The magnitude of this volume effect is given by the reduction in the volume of sales caused by passing-on of the overcharge multiplied by the gross margin, i.e. the difference between price and marginal cost, which would have been secured on those lost sales volumes.

Study on the Passing-on of Overcharges

702. Drawing on the expression for overall damages set out in Section D.1.1 of this Annex, the volume effect can be denoted as follows:

$$\text{Volume effect} = (p_0 - c_0) \times (q_1 - q_0)$$

703. In turn, the reduction in sales volume associated with a given pass-on effect on price will depend on the sensitivity of demand to the price changes induced by the overcharge.

Box D.2: Relationship between the passing-on and volume effects

Reduced sales volumes are, in general, an inevitable consequence of increased prices. Whenever a firm is contemplating increasing its prices, it is therefore – at least implicitly – balancing the increased profit margins that will be earned as a result on retained sales against the margins that would have been earned on the sales volumes that will be lost.

A firm passes on (at least part of) the overcharge it suffers because this is more profitable than fully absorbing the impact of the cost increase. An overcharge which raises marginal costs will squeeze the margins earned on sales at the prevailing price. That makes it less costly in profit terms to increase price at the expense of losing some sales. The extent to which the overcharge is passed through to prices depends critically on this trade-off.

704. Importantly, in oligopolistic markets, the extent of the volume loss suffered by the direct purchaser will depend not only on the sensitivity of its sales to its own price response to the change in its costs, but also to the effects on competitors' behaviour too (including competitors' responses to the response of the affected firm, etc.). For example, to the extent that competitors would increase their prices too, this will mitigate the impact of the direct purchaser's own price increase on its sales. Conversely, if competitors would respond to a reduction in the direct purchaser's output by expanding their own sales, say, then that will tend to exacerbate the volume effect associated with a given increase in price and the damage to the direct purchaser caused by the overcharge.
705. These considerations have particular practical significance because they imply great care must be taken when applying elasticity data in the calculation of damages. Specifically, if the elasticity estimates that are used do not take appropriate account of the changes in competitors' prices, then the resulting estimate of volume loss will be under- or over-estimated. Notably, a measure of the sensitivity of a direct purchaser's sales to changes in its own price taking all competitors' prices to be constant will lead to an overstatement of the volume loss if, in fact, competitors' prices would also be increased as a result of the overcharge.
706. To see this, note that in a market with vigorous competition between identical firms and symmetric relationships between those firms there will be no net shift in sales between firms in response to pass-on of an industry-wide

overcharge, though there may be some loss of sales from the market as a whole. In contrast, if a single firm is affected by the overcharge then, by passing on some of that overcharge, it is liable to lose a substantial fraction of its sales to unaffected rivals. Hence the volume effects are likely to be very different in the two scenarios.

The relationship between the volume effect and the other components of damage

707. By combining and re-arranging the expressions for the components of damage set out [Section D.1.1](#) above, the overall damage can be expressed as a multiple of the overcharge term, $q_1 \cdot \Delta c$, as follows:

$$\text{Damage} = q_1 \Delta c \times \left(1 - \left[\frac{\Delta p}{\Delta c} + \frac{(p_0 - c_0)}{q_1} \times \frac{\Delta q}{\Delta c} \right] \right)$$

where Δc , Δp , and Δq are the changes in marginal costs, prices, and the affected firm's sales volume induced by the infringement respectively.

708. The terms in the square brackets are the pass-on and volume effects respectively and, collectively, can be interpreted as implying a discount on the overcharge effect.³⁷⁵ If the discount term is positive, such that the term in the large round brackets is smaller than 1, then the overall damage will be less than the overcharge effect. In other words, the impact of the passing-on and volume effects combined will diminish the damage suffered by the firm in question. On the other hand, it is conceivable that the discount to the overcharge could actually be negative, i.e. the overall damage exceeds the overcharge effect alone. This will be the case if the volume effect more than offsets the passing-on effect. In other words, the impact of the overcharge will be magnified.
709. Conceptually it is also possible for the term in square brackets to be greater than 1, if the pass-on effect outweighs the volume effect sufficiently. In this case, the overall damage could be negative. In other words, the firm's profits might be increased as a result of the overcharge.
710. Furthermore, the margins that are predicted to result from a firm's price (alternatively quantity) decisions will be related to the price sensitivity of its demand. (See [Section III.A](#) above, for example.) Hence, drawing on these relationships, the expression for damages set out above can be further simplified, as described below.

³⁷⁵ See, for example, Verboven and van Dijk (2009).

Homogeneous goods setting with ‘Cournot’ competition³⁷⁶

711. As noted above, the standard Cournot model contemplates oligopolistic competition in a homogeneous goods setting. There is a single market price, which is determined by the aggregated outputs of all competing firms. In that setting, the pass-on rate is given by the rate at which the cost change affects aggregate output multiplied by the rate at which the output change translates into changed prices; i.e. the slope of inverse demand.

Industry-wide overcharge

712. In a symmetric industry setting, theory predicts that the mark-up of price over marginal cost secured by a firm in a Cournot setting will be set equal to $1/N$ times the inverse of the market elasticity of demand, where N is the number of firms on the market. In this case, the volume effect for a firm affected by a small industry-wide overcharge can be expressed as a function of the overcharge, the pass-on rate (τ), and the number of firms (N), as follows:³⁷⁷

$$\text{Volume effect} = \text{Overcharge} \times \tau \cdot \frac{1}{N}$$

713. Hence , the overall damage is given by:

$$\text{Damage} = \text{Overcharge} \times \left(1 - \tau \cdot \left(1 - \frac{1}{N} \right) \right)$$

714. The passing-on and volume effects combine to imply a discount to the overcharge effect that depends only on the pass-on rate and the number of firms in the industry.

715. That discount will be larger, i.e. the damage will be smaller, the greater the number of firms on the market. The greater the number of firms and, therefore, the less concentrated the industry, the more competitive outcomes are likely to be, leading to narrower margins. As a result, the profits associated with the volumes lost as a consequence of passing-on will be smaller. Conversely, the smaller the number of firms, the smaller the discount. Indeed, in the monopoly case ($N = 1$), the discount to the overcharge is eliminated entirely. In this case, the volume effect completely

³⁷⁶ The material in the following sections draws heavily on the analysis in Verboven and van Dijk (2009).

³⁷⁷ The relevant theory assumes a very small overcharge.

offsets the damage-reducing impact of the pass-on effect.³⁷⁸ **Box D.3** below contains further discussion of this observation:

Box D.3: Monopoly and the relationship between the passing-on and output effects

The standard economist's toolkit makes extensive use of differential calculus. In the present context that implies that the analysis reported in the economic literature considers the effects of infinitesimally small overcharges. It is in that context, in particular, that the monopoly result described above – namely that there is no discount on the overcharge effect – is derived (see e.g. Verboven and van Dijk (2009)). For very small overcharges and, consequently, small downstream prices changes, the output effect and the pass-on effect will offset one another almost exactly in the monopoly scenario. If this were not the case, then the original pricing decision cannot have been optimal for the monopolist.

Nevertheless, simple application of the economics of monopoly indicates that, in general, i.e. when the overcharge and subsequent pass-on is not infinitesimally small, the lost output effect will be greater than the pass-on effect (Area C will be larger than Area B in **Figure 5**). In other words, the overcharge term alone will understate the damage sustained by the (monopoly) direct customer.

To see this graphically, consider again the situation illustrated in **Figure 2**. Suppose that the direct purchaser were to consider increasing its price from p_0 to p_1 absent any input overcharge. In this case, the output sold by the firm would contract from q_0 to q_1 , causing a loss of profit equal to Area C. At the same time, the increase in price would result in enhanced profits on retained sales q_1 , equal to Area B.

By construction, the monopolist chooses price p_0 over p_1 absent any overcharge effect. It follows that any price above or below that level must imply a smaller profit. Critically, it follows therefore that the profit gain (Area B) from increasing price from p_0 to p_1 must be more than offset by the profit margins (Area C) lost through the contraction in sales that results from doing so. If not, the monopolist would have increased its price to p_1 already.

In summary, the negative lost output effect resulting from any increase in the direct purchaser's price above that level must exceed the positive pass-on effect. (See, for example, Hellwig (2006) for an articulation of this intuition).

At the same time, it must be the case that once the direct purchaser's costs are increased as a result of the cartel (that is marginal cost rises from c_0 to c_1), it becomes profitable to elevate price to p_1 . Graphically (see **Figure 6** above), if the direct purchaser were to hold prices and output fixed after the increase in its costs, the extra cost of producing that output would be equal to $c_1 - c_0$ multiplied by q_0 . The profit margins lost by contracting output to q_1 would, therefore, be reduced to only that part of Area C lying above c_1 (i.e. Area C'). Raising price is thus now profitable because (there must be an increased price p_1 for which) Area B is bigger than Area C'.

Firm-specific overcharge

716. In homogeneous goods markets there is a single market price. Hence, even if the overcharge affects one firm only, any consequent pass-on effects on

³⁷⁸ This 'perfect' offset arises because a very small overcharge is assumed. Other differences involve 'second-order' effects.

price will be common to the industry as a whole. Any asymmetric impact on the firm that is subject to the overcharge must, therefore, materialise via the scale of the volume effect.

717. All else being equal, a firm that is subject to an overcharge which increases its marginal costs is predicted to reduce its output. Under oligopolistic conditions, the effect of this will be to increase the market price. Under 'Cournot' assumptions, however, competitors may 'respond' to such an output contraction by expanding their own outputs somewhat, offsetting some of the price effect and thereby reducing the extent of pass-on. As a result, the volume effect faced by the firm affected by the overcharge may completely offset any pass-on effect, implying no discount of the damage caused relative to the basic overcharge measure.

Differentiated products setting with 'Bertrand' competition

718. A differentiated products setting provides scope for an equilibrium in which multiple firms can secure positive sales while competing on price.³⁷⁹ In that environment, the volume effect for firm i can be expressed as follows:

$$\text{Volume effect (firm } i) = (p_0 - c_0) \times \left[\frac{\Delta q_i}{\Delta p_i} \cdot \frac{\Delta p_i}{\Delta c} + \sum_{j \neq i} \frac{\Delta q_i}{\Delta p_j} \cdot \frac{\Delta p_j}{\Delta c} \right]$$

719. Significantly, the sensitivity of firm i 's sales volume to the price effects of an overcharge Δc will depend not only on the effects on the firm's own prices ($\frac{\Delta p_i}{\Delta c}$), but also the impact on competitors' prices ($\frac{\Delta p_j}{\Delta c}$) and the sensitivity of firm i 's sales volumes to those competitor price changes ($\frac{\Delta q_i}{\Delta p_j}$) too.

Industry-wide overcharge

720. If there is sufficient symmetry amongst competing firms, the market-wide elasticity of demand provides the relevant indicator of the sensitivity of a firm's demand to pass-on of an industry-wide overcharge.³⁸⁰ Moreover, using the condition for profit maximization, the expression for the volume effect can be simplified as follows:

³⁷⁹ In a home homogeneous goods setting, the firm setting the lowest price will attract all sales, subject to capacity constraints.

³⁸⁰ In this setting, all firms will be affected equally and will pass-on the overcharge equally. Hence, the individual firm's demand will be less sensitive to pass-on compared to the case where it is subject to a firm-specific overcharge.

$$\text{Volume effect} = \text{Overcharge} \times \tau \times (1 - D)$$

where, again, τ is the pass-on rate, whilst D is the aggregate diversion ratio encountered previously, i.e. the proportion of sales lost by an individual firm in response to a price increase that is diverted in aggregate to competitors on the market.

721. The overall damage suffered by the direct purchaser as a result of an industry-wide overcharge is then given by:

$$\text{Damage} = \text{Overcharge} \times (1 - \tau \cdot D)$$

722. In words, the impact of the overcharge is discounted due to the net effect of the passing-on and volume effects by a factor which is the product of the pass-on rate and the aggregate diversion ratio for the industry.
723. Whether the overcharge is specific to a single firm or is industry wide, the volume effect for a given firm (affected directly by the overcharge or not) will be determined by the pricing responses of all firms on the market. Importantly, under the assumptions of the Bertrand model, firms can generally be expected to 'respond' to an increase in rivals prices by increasing their own prices too. In a symmetric setting with an identical, industry-wide overcharge effect, all firms are predicted to adjust their prices identically. Hence, in a symmetric industry, individual firms will not lose sales to other firms in the industry in this case. However, as prices in the industry are increased there will, in general, be some overall loss of sales, as customers switch purchases to outside goods. The greater the aggregate diversion ratio, the smaller this loss of sales outside the market.
724. A greater aggregate diversion ratio implies more intense competition between the firms on the market. In this context, the profit associated with the volume effect will be diminished. As a result, the net impact of the pass-on effect is enhanced, leading to damages which involve a greater discount to the overcharge term.

Firm-specific overcharge

725. As in the case with industry-wide overcharge effects, the extent of the volume effect for a firm that suffers a firm-specific overcharge will depend on the sensitivity of the firm's demand to the pricing 'responses' of all competitor firms. In other words, the volume effect will depend not only on how the affected firm's own price changes, but also on how its competitors' prices will respond to the overcharge (or, more precisely, how those

competitor prices will respond to the affected firm's price response to the overcharge).³⁸¹

726. As noted, firms that are unaffected directly by the overcharge will generally respond to an increase in the affected firm's price by increasing their own prices too. However, the price responses of competitors that are not directly affected by the overcharge will be different to that of the firm that is affected, i.e. the symmetry in the pass-on rates that is observed with industry-wide overcharge effects no longer holds. The volume effect will depend on these responses and, therefore, on the extent to which the overcharge effect suffered by the affected firm is, effectively, "passed on" to the prices of competitors too. Hence the volume effect derived in the case of an industry-wide overcharge must be modified somewhat. Specifically, the volume effect can be expressed as follows:

$$\text{Volume effect (firm } i) = \text{Overcharge} \times \sum_{j \neq i} D_{ij} \frac{\Delta p_j}{\Delta c_i}$$

where $\frac{dp_j}{dc_i}$ is the 'cross' pass-on rate for firm j in response to a change in firm i 's costs and D_{ij} is the diversion ratio from firm i to firm j , i.e. the proportion of sales lost by firm i when its price increases that are diverted to firm j .³⁸²

727. The overall damage can, therefore, be expressed as:

$$\text{Damage} = \text{Overcharge} \times \left(1 - \sum_{j \neq i} D_{ij} \frac{\Delta p_j}{\Delta c_i} \right)$$

728. In words, the passing-on effect and the 'direct' volume effect caused by the increase in firm i 's own price cancel each other out.³⁸³ The net effect is therefore the positive volume effect for firm i caused by the increase in its competitors' prices. This will be positive, i.e. it will reduce the damage caused to firm i compared to the pure overcharge effect.

Group-specific overcharge

729. In general, an overcharge may affect more than one firm in a market without affecting all firms. As such, this group-specific overcharge scenario

³⁸¹ Competitor firms will not respond directly to an overcharge that only affects a rival. However, they will set different prices (or, alternatively, output levels) if the affected firm behaves differently as a result of the overcharge.

³⁸² This exact expression relies on symmetry in the 'cross-price' effects of changes in the price of one good on demand for another.

³⁸³ At least given the focus on very small effects typically considered in the theoretical literature.

represents an intermediate case, between the firm-specific and industry-wide extremes.

730. In a homogeneous goods industry characterised by Cournot competition, the extent of pass-on will vary according to the number of affected firms. Provided demand is not too concave, the extent of the adverse impact on individual firms' sales volumes will diminish with the number of affected firms. The greater the number of affected firms, the smaller will be the effect of strategic expansion by unaffected firms described above.
731. In the case of differentiated Bertrand competition, the key implication of an overcharge affecting multiple firms is that the upward pressure on competitor prices will be increased. As a result, the discount to the overcharge will be increased for affected firms relative to the firm-specific case.

Summary

732. In a 'Bertrand' world of differentiated price competition with symmetric demand and cost conditions, a positive discount relative to the impact of an industry-wide overcharge is in order. That is, the overcharge overstates the actual damage incurred by direct purchasers. The magnitude of this discount depends positively on the product of two key variables, namely:
- the pass-on rate, i.e. the proportion of the overcharge that is passed through to prices; and
 - the aggregate diversion ratio; i.e. the fraction of sales lost by one competitor that are diverted to its rivals, in aggregate.
733. By way of example, if the pass-on rate is 60% and the aggregate diversion ratio is 50%, then the defendant can claim a 30% discount from the overcharge.
734. The corresponding discount in the scenario with Cournot competition (and symmetric demand and cost conditions) also depends on the pass-on rate. In this case, however, the magnitude of that discount also increases with the number of competing firms. That is, if the pass-through rate is 60% and there are four identical firms competing on the downstream market, then the defendant can claim a 45% discount on the overcharge.
735. Note that cost pass-on rates in excess of 100% are feasible in respect of industry-wide overcharge, depending on the shape of the demand curve, as well as the nature and intensity of competition between firms. In other words, the increase in the direct purchaser's own prices can exceed the

increase in its unit costs. In some (but not all) circumstances where pass-on exceeds 100%, the direct purchasers' profits may also increase. In other words, in these circumstances direct purchasers are predicted to gain as a result of the price infringement. (Put differently, the discount to the overcharge may exceed 100%.) The reason for this is that, in these circumstances, the positive, competition dampening effect of the input price increase on revenues more than offsets the adverse direct effect on costs.

736. In the Bertrand competition scenario (again with symmetric demands and costs) a discount to the overcharge effect also applies when the overcharge is entirely specific to one firm. This compares to the finding in the monopoly case, in which there is no such discount (assuming an infinitesimally small overcharge). The reason for this difference is that competitors in the Bertrand scenario will respond to the firm-specific increase in costs and prices by increasing their own prices too. This reduces the magnitude of the volume effect, all else being equal.

737. Significantly, a negative discount may arise in the case with Cournot competition when the overcharge affects one downstream competitor only. In other words, the volume effect for that firm may exceed the pass-on effect, exacerbating the damage suffered by direct purchasers. The reason for this difference is that in the Cournot setting, rivals may respond to the affected firm's reduction in output by expanding their own output. This will dampen the pass-on effect on prices, all else equal, for a given reduction in the affected firm's output.

D.2. Insights from relevant economic theory: indirect purchaser effects

738. Indirect purchasers are also liable to be affected by an overcharge. The extent of the damage caused to those customers by the original overcharge will depend on the passing-on behaviour of direct purchasers.

D.2.1. Indirect purchaser overcharge

739. If direct purchasers choose largely to absorb the effects of the original overcharge, then the impact on indirect purchasers is likely to be modest. At the other extreme, it is also possible – as shown above – that the responses of direct purchasers may result in a magnification of the original overcharge effect as it is passed through to indirect purchasers.

740. Economics predicts that the rate at which the original overcharge translates into an overcharge affecting the indirect purchaser will depend on the product of the rates at which:

- the overcharge affects the direct purchaser's marginal costs;
- the change in the direct purchaser's marginal costs is passed through to its price; and
- the change in the direct purchaser's price affects the indirect purchaser's average costs.

741. Note here the distinction between the effects on average and marginal costs.³⁸⁴ As described above, mainstream economic theory emphasises the role of marginal costs in shaping a firm's pricing decisions. In this case, it is the effect of the overcharge on the direct purchaser's *marginal* costs which will determine the extent to which that overcharge is passed through to its prices. However, the magnitude of the overcharge suffered by the indirect purchaser depends on the overall increase in its per unit (average) costs.

742. As discussed above, the initial overcharge could, conceivably, affect the levels of the fixed fees negotiated between the direct and indirect purchasers. In this case, such renegotiations could affect the average costs incurred by the indirect purchaser, even if they do not affect its marginal costs.

D.2.2. Passing-on and volume effects at the indirect purchaser level

Passing-on effects

743. In general, direct purchasers may not supply end consumers directly. Instead, they may supply inputs to intermediate producers (i.e. indirect purchasers that have their own purchasers). Those intermediate indirect purchasers will either serve end consumers themselves, or supply another layer of intermediate producers.

744. Where such intermediate indirect purchasers suffer an overcharge, they may be able to mitigate the damage somewhat by passing on at least some of the effect to their own purchasers. The theoretical insights regarding pass-on by direct purchasers translate straightforwardly to pass-on by intermediate indirect purchasers too. However, the source of the increase in the indirect

³⁸⁴ Where constant marginal costs apply (as is frequently assumed in the literature), the distinction between average variable and marginal costs disappears.

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purchaser's costs is not the original overcharge, but the passing-on of that overcharge by direct (and possibly other indirect) purchasers.

745. Again, what is relevant to pass-on by indirect purchasers is the impact on their marginal costs. Thus, similarly to the overcharge effect, the rate at which the original unit overcharge is passed through to an indirect purchaser's prices is given by the product of the rates at which:

- the original overcharge by the direct purchaser is passed on;
- the increase in the direct purchaser affects the indirect purchaser's marginal costs; and
- the change in the indirect purchaser's marginal costs is passed on to its prices.

746. At the same time, the extent of the original overcharge will, in general, depend on the impact that this will have on the direct purchaser's demand for the input, which will depend on the extent to which the increase in the direct purchaser's costs will be passed on to its prices, which will depend on the extent to which that will affect the indirect purchaser's demand for the direct purchaser's output, which will depend on the extent to which the corresponding increase in the indirect purchaser's costs will be passed on to the indirect purchaser's own prices, which will depend on the extent to which that will affect the indirect purchaser's demand.

Volume /consumption effects

747. Indirect purchasers will also experience damage as a result of volume or lost consumption effects. In the case of intermediate indirect purchasers, this is the analogue of the volume effects experienced by direct purchasers; i.e. the profit margins that would have been earned on sales volumes that are not made because of the passed on price increases. In the case of final consumers, an increase in the price of products will generally result not only in an overcharge, i.e. more being paid for the units that are consumed, but also in reduced consumption. This will have an adverse effect on those final consumers too, as they will lose the satisfaction or 'utility' associated with this lost consumption. This loss of utility is captured by the so-called "dead-weight loss" triangle identified in **Figure 2**. As discussed in Section I however, the "dead-weight loss" has not been considered further as part of this Study.

D.3. Aggregate damages

748. The pass-on effect at one layer in the supply-chain will become the overcharge effect for the layer that is immediately downstream. Hence, these terms will cancel each other out in terms of contributing to the aggregate net downstream damage caused by the pricing infringement. It follows that the aggregate damage comprises the overcharge of direct purchasers and the sum of the volume effects along the supply chain.³⁸⁵ Since the volume effects are always positive, this implies that the overall downstream damage will always exceed the direct purchaser overcharge effect.

749. At the same time, it is possible, as noted, that direct/intermediate indirect purchasers may be made better off as a result of industry-wide cost increases. That will be the case where the competition-dampening effect of the cost increase on downstream prices more than offsets the direct adverse effect. However, in this case, the (potentially magnified) adverse effect arising from the pricing infringement will be borne by downstream purchasers, including final consumers who cannot benefit from any pass-on effect.

³⁸⁵ See Han et al. (2009).

Annex E – Issues with the standard regression model to estimate pass-on rate

750. This annex presents a number of technical issues associated with the standard linear regression model that is used to estimate pass-on rates.³⁸⁶ This model, although capable of controlling for the potential influence of confounding factors, has several drawbacks that the expert (and judges) must be aware of when weighing regression results against other types of evidence.

E.1. Linear vs non-linear relation

751. There is no reason to consider that the pass-on rate is constant. Rather, the pass-on rate may vary with the size of the cost change. For example pass-on may be greater for large cost changes than for small changes in cost. **When the functional form used for the regression model may be too restrictive to pick-up such a relationship, which in turn may bias the result.**

752. If, as is often assumed, the regression model used to estimate pass-on rate posits a linear relationship between price and cost, as is shown above ([Section IV.B.1.3](#)), then the pass-on rate is restricted to being always the same, regardless of the magnitude of the cost change. This assumption is valid for some classes of demand system. For example, when a monopoly firm faces a linear demand curve, the pass-on rate is always equal to $\frac{1}{2}$, regardless of the size of the cost change. Equally, with constant elasticity demand function, regardless of the price level, the pass-on rate is the same.³⁸⁷ However, this will not be the case generally. In practice, the economic expert may have no *a priori* knowledge about the shape of the demand curve, and therefore he or she cannot presume that the pass-on rate is constant. MacKay et al. (2014), for example, consider this source of bias when estimating the standard regression model, which they call misspecification.

Box E.1: Non-linear model specification

The expert can address the misspecification bias using standard techniques such as splines regression or using a polynomial model specification. The standard regression is linear in its variable, however it is not difficult to introduce non-linearity by including the price of the input at higher order. For example, drawing on the flour illustration again, the economic expert may estimate the model using a quadratic specification, which consists of including the square of the price of grain as follows (to simplify presentation we omit the confounding factors here):

³⁸⁶ Some examples of studies using the standard reduced form regression model includes Ashenfelter et al. (1998), Gron and Swensson (2000) and Miller et al. (2015).

³⁸⁷ See Bulow and Plfeiderer (1983).

$$price\ flour = \alpha + \beta_1 price\ grain + \beta_2 price\ grain^2 + error$$

The regression above can be estimated using the OLS estimator, and in this case the pass-on rate varies with the price of grain as follows:

$$\tau = \frac{\partial price\ flour}{\partial price\ grain} = \beta_1 + \beta_2 price\ grain$$

With this specification, the parameter β_2 determines how the pass-on rate, τ , varies with the price of grain. When β_2 is positive (negative), the pass-on rate becomes larger (smaller) at higher price levels. If the coefficient estimate of β_2 is equal to zero, this suggests that the linear relationship is sufficient, implying that the pass-on rate is constant.

E.2. The pass-on of the overcharge might be delayed

753. The standard pass-on regression presented above only contemplates contemporaneous changes in the price of the affected input and the downstream price. However, the purchaser may delay passing-on the overcharge. This might be because the initial input price increase is too small to justify a costly change in price and/or because the purchaser expects that that increase might be short-lived. It may be also the case that customer contracts ‘tie’ the purchaser’s price for some period, preventing immediate pass-on. If the purchaser incurs “menu costs” in changing prices, it will prefer to limit the number of changes it makes, and in such a case, it may pass-on an overcharge only after some time.

754. The standard regression may then not capture accurately the impact of the overcharge on the downstream price. Consider, for example, that the expert uses monthly price data to evaluate the pass-on rate, and that the purchaser took six months before starting to pass on the effects of an overcharge. In this case, **the standard regression model, which only measures the contemporaneous change between the price of the affected input and the downstream price, will understate the actual pass-on rate.**

755. One way for the expert to address this issue is to develop an explicitly dynamic model, by including information on the prices of the affected input for multiple time periods. For example, in the case of the flour example described previously, the model can be written as follows, where the price of grain for the previous period, which is also referred to as “lagged” price variable, is also included (for simplicity omitting other confounding factors):

$$price\ flour_t = \alpha + \beta_1 price\ grain_t + \beta_2 price\ grain_{t-1} + error_t$$

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756. In this case, the longer term pass-on rate is equal to $\beta_1 + \beta_2$. Naturally this approach can be flexed to include additional lagged variables for the price of grain.³⁸⁸
757. For example, Borenstein et al. (1997) assess the absolute pass-on from crude oil prices to retail gasoline prices. They adopt a dynamic model whereby the change in retail gasoline price depends on crude oil price changes in previous periods. This dynamic specification allows them to distinguish between short-run and long-run responses to fluctuations in crude oil prices.
758. The authors attempt to explain the asymmetry in the speed of adjustments. To this end they also estimate how changes in the crude oil price causes prices at intermediate levels of the supply chain to change (that is, spot gasoline prices and terminal prices), and also how changes in prices at these intermediate levels affect retail prices.
759. The results indicate that a 1 cent per gallon increase in crude oil leads to a 0.55 cent increase in the first two weeks whereas a 1 cent per gallon decrease increases the retail price by 0.18 cents per gallon. However, after ten weeks the adjustment from spot gas to crude is close to full. After ten weeks, a 1 cent increase in crude oil leads to a 0.88 cent increase in generic gasoline while a 1 cent decline in crude oil leads to by a 1 cent decline in generic gasoline.

E.3. Firm-specific overcharge vs. industry-wide overcharge

760. As indicated above ([Section III.B.2.](#)) the extent to which the overcharge is passed on depends in part on whether the cost increase is firm-specific or, instead, industry-wide and thus affects all competitors on the downstream market. This may raise some estimation issues when the expert employs aggregate price information and not firm-specific price data.
761. First, we discuss the case when the overcharge is firm-specific, which implies that some competitors of the relevant purchaser have not been directly affected by the infringement. The economic expert may, nevertheless, seek to use industry level data to estimate pass-on; perhaps because it is the only data readily available. The dependent variable of the regression model is thus the market price (essentially, the average price of all competitors). The model might include as explanatory variables the inflated price of the input (which does not affect all competitors' prices) as well as other relevant confounding factors. In this set-up, pass-on of the overcharge to the

³⁸⁸ For more on dynamic models of cost pass-on see Annex A.3 of the 2014 RBB OFT Report.

affected firm's price is likely to be understated since, by construction, the dependent variable also reflects the prices of competitors that have not been directly impacted by the overcharge. If firm-level data is not available, this analysis will provide a lower bound of the pass-on rate.

762. Second, when the overcharge is industry-wide, the expert may consider using industry-level data. Even if all competitors have been impacted by the same cost increase, individual firms however may not pass on the overcharge to the same extent in differentiated product markets. One reason for this is that in differentiated product industries, demand elasticity of individual products need not be the same, i.e., consumers of individual products may react differently. For example, Kim and Cotterill (2008) show that heterogeneity in consumer demand explains differences in pass-on rates in response to the same marginal cost increase among US manufacturers of processed cheese. (Manufacturers are assumed to have similar cost functions.) In addition, firms may also adjust prices differently because they employ different production technologies. For instance, competitors may use the affected input in different proportions to other inputs, causing their respective marginal costs to be affected differently too, which may imply that the extent to which prices are adjusted vary across products. Unlike the preceding paragraph, in this case, it is not possible to sign the direction of the bias.

E.4. Using overall marginal cost data may bias the pass-on rate

763. As indicated above (see paragraph 331) the expert may consider estimating the pass-on rate with respect to the price of a specific input or with respect to changes in the purchaser's overall marginal cost. In the latter case, if the objective is to obtain a measure of the purchaser specific pass-on rate, as would be the case when the case involves firm-specific overcharge, it is necessary to control for the influence of common cost variation on prices, otherwise the regression results would be biased.
764. In general, a firm's marginal cost can be split between firm-specific and industry-wide cost components. For example, polyurethane foam is a widely used input in the production of mattresses. It is used by many manufacturers, hence, it is considered as an industry-wide cost component. On the other hand, some expenditures such as the cost of the maintenance of equipment may be more specific to individual firms.
765. If only data on marginal cost are available, then the expert must consider carefully how to estimate a firm-specific pass-on rate. For example, the expert may only have accounting data on the cost of goods sold for the

purchaser, which may be taken as a proxy for marginal cost. Since marginal costs will vary in response to both firm-specific and industry-wide cost variations, and the expert is only interested in the impact of firm-specific cost, she should attempt to neutralise the influence of any industry-wide cost variation. As a solution, Ashenfelter et al. (1998) propose to include rivals' marginal cost as control variable. This new variable also varies because of fluctuations in common costs, and its inclusion controls for their potential influence. As a result, data on the marginal cost of one rival could be used to account for common cost variation.³⁸⁹

E.5. The competitive interaction bias

766. The expert may estimate the impact of the price of the affected input on the relevant downstream price using the regression model presented above ([Section IV.A.](#)). As explained in other sections of this report (e.g. [Sections III.A.4](#), [III.B.5](#), and [IV.A.4.2](#)), in oligopoly markets, in addition to cost and demand factors, competitive inter-action also affects how firms set prices, yet the standard regression model omits this particular factor.

767. Omitting to account for the influence of competitive inter-action may bias the regression results if such interaction is correlated with the cost variables, which might well be the case. Indeed, if the relevant purchaser raises its price because of an increase in marginal cost, this will cause competitors to react, which in turn will trigger additional reaction from the purchaser. In a standard Bertrand model of price competition with differentiated products, pass-on by the firm whose cost is increased will tend to be magnified as a result of the strategic responses of rivals ([Section III.B.5.](#)).

768. As there is no obvious solution to this issue, one possible way to address this concern would be to include variables that account for the change in the cost of rivals.³⁹⁰

E.6. The partial informational bias

769. MacKay et al. (2014) indicate that the standard pass-on regression may embody a so-called informational bias, which only occurs when the pass-on

³⁸⁹ Ashenfelter et al. (1998) estimate the pass-on elasticity of a major chain of office supply superstore in the US, and distinguish the effects of firm-level and industry-wide input cost shocks on price. This study highlights the importance of including industry-wide cost shocks (or the marginal cost of rivals), if it cannot be assumed that that firm-specific and industry-wide components are independent. In their case, they show that omitting industry-wide cost change biases the estimation of firm-specific pass-on.

³⁹⁰ See for example Miller, Osborne, and Sheu (2016).

rate is not constant; that is when it varies depending on the magnitude of the cost change (see above paragraphs 751-752).

770. Importantly, this bias arises for different reasons than the so-called omitted variable bias (see paragraph 357). To recall the omitted variable bias arises when the model specification does not include relevant factors that also influence prices but that are correlated with other control variables.
771. The main difficulty with the partial information bias is that it may arise in circumstances that may be difficult to evaluate in practice. For example, such bias may occur when the regression model includes the price of the input in question but omits other cost components that are related but not correlated with that particular input. Specifically, consider a standard regression model that includes the price of the input in question, but omits the price of other important factors of production. These prices could be related as follows. During the infringement, the price of the input in question is higher and at the same time prices of other inputs are volatile, while outside the infringement period the price of the cartelised input is lower whilst prices of other inputs are stable. In technical terms, the price of the cartelised input is said to be positively correlated with the variance of the price of other inputs. Such a relation, although less straightforward, will lead the regression model to overstate the pass-on rate if the price of these other factors are not included as control variables.
772. Using a simple model of competition, MacKay et al. (2014) simulate the potential impact of the partial information bias, which is shown to be potentially significant. In that particular simulation, the regression model overstates the pass-on rate by 12.4%.
773. In the above discussion, the unobserved cost variable is a component of the purchaser's marginal cost. In this case, the omission of the other cost components affects pass-on via the change in total marginal costs. Alternatively, the unobserved cost variable might be a competitor's cost, and in this case, it affects pass-on indirectly. That is, competitors' costs influence competitor's price, and thus pass-on via strategic interaction.

Annex F – Approaches to estimate elasticity of demand

774. This annex presents a short overview of various approaches to obtain a measure of the relevant price elasticity of demand.

F.1. Estimating a demand model

775. To obtain an estimate of the price elasticity of demand for a given product, the expert may consider estimating a demand model, whose parameters can be used to recover a measure of elasticity. In economics, the demand model, which relates price and volume sold, represents through a mathematical equation how consumers respond to price changes. Once the model parameters are estimated, the expert can use the parameter estimates to predict how a price rise causes a reduction in sales.

776. The type of modelling approach to estimate customer demand will depend in part on the category of product at issue. It is useful to distinguish two situations: (i) single homogenous product market and (ii) differentiated products market.

777. When the product supplied by competitors is perfectly homogenous, that is, all suppliers provide an identical product, in principle a supplier will lose all of its sales to competitors if it raises its price above the market price (if those have enough production capacity to meet this new demand). In this case, the elasticity faced by the firm is extremely large (in absolute value). In such a situation, the purchaser would have an incentive to absorb the cost rise, in fact all of it, as it would lose all sales if its price would be elevated.

778. When products sold by purchasers on the downstream market are differentiated, the expert will have to estimate the elasticity of demand for each product. In differentiated product markets, customers view alternative products that have the same end use (e.g. automobile) but may be different over several dimensions that appeal in various ways to customers (e.g. different brands, models, colours, engine sizes etc.) as potential substitute. In this context, when the price of a product is raised, not all sales are lost to competing products. For example, if the price of Mercedes rises, some of its potential buyers would turn instead to rival brands, such as BMW, but some of them would still choose Mercedes.

779. In comparison to homogenous good markets, it is more challenging to estimate elasticities in this type of markets. Each product may have a different price elasticity, depending notably on the extent to which its customers would switch to rival products. This means that if a market has multiple products, the expert has to estimate own-price elasticities for each product. In addition, the expert has to consider cross-price elasticities, which measure by how much sales of rival products increase when the relative price of a given product rises. We expect sales of close substitutes to increase by more, hence cross-price elasticities cannot be assumed to be equal. Overall, experts will have to uncover a large number of elasticities, which will be a challenge. To illustrate: in a 10-product market, there are 90 cross-price elasticities, so in this cases, experts will have to estimate 100 elasticities!
780. The academic literature offers a number of approaches to estimate average consumers' reaction to price change in differentiated product markets. To overcome the dimensionality problem (e.g. estimating 100 parameters is not realistic for a market with 10 products), these approaches typically impose some restrictions to limit the number of parameters to be estimated, yet still allow the expert to estimate all own and cross price elasticities. In some cases, however, these restrictions may imply unrealistic substitution patterns (see Berry (1994)).
781. The advantage of estimating a demand model is that the coefficient estimates that serve to compute the elasticity measures are based on data that reflect actual consumer behaviour, unlike other approaches that are based on potentially less comprehensive information. In addition, the expert may provide a so-called confidence interval (see [Section VI.D](#)), which provides some information about the precision of the elasticity estimate.
782. The main disadvantage of these approaches is that more sophisticated regression analysis will be required, which not only will increase the level of technical difficulties but it will also be time consuming. Unlike standard regression analysis, for which the ordinary least square (OLS) estimator is usually employed, the expert will have to consider adopting an instrumental variable (IV) estimator, otherwise the coefficient estimate of the model will be biased, rendering the elasticity measure unreliable (see Berry (1994)). This approach is not always easy to implement. In particular, the expert will have to find so-called instrumental variables, which are factors that affect prices, but are not correlated with unobserved change in demand conditions or consumer preferences. The choice of these instrumental variables can be the subject to debate. Traditionally, cost variables have been used as instruments. Berry, Levinsohn and Pakes (1995) propose to use as instrumental

variables combinations of the rivals' products' characteristics. Alternatively, Nevo (2000) exploits the panel-data structure and uses the price of the product in question in other cities/regions as an instrument, in a way similar to Hausman (1996).

783. In addition, and importantly, this approach requires the collection of data on price, volume sold, and other demand shifter variables such as product characteristics for all competing products. For example, to estimate a demand model for sugar-based carbonated soft drinks, the expert will have to gather data on prices and volume sold for all of these drinks as well information on the main characteristics of these product (type of containers in which they are sold, taste etc.). Data on consumer goods may be available at the retail level, notably scanner data is increasingly common. Such data typically can be used to estimate a demand system, when available at a sufficiently granular level including e.g. also information on product characteristics.
784. Finally, the expert will have to select a particular family of demand models. Although the academic literature contains different alternatives, the most popular model used by industrial organisation economists is based on the random utility/discrete choice framework. This modelling approach is based on random utility model, where consumer utility depends on price, observed and unobserved product attributes and a random component which is not observed but that is assumed to follow a particular probability distribution function. Consumers are assumed to select the product that yields the highest level of utility. Naturally, if the price of the selected product increases, this lowers utility and consumers may decide to opt for another product that provide more utility.
785. Using a particular assumption about the distribution of the random utility component, it is possible to derive a particular demand equation, is the so-called the logit demand. There are different versions of this logit model, each of them imposing various degree of restriction on consumer substitution pattern. For example, in the standard logit model the price elasticity of any individual product is a function of one parameter estimate, the market share that product and its price. Although this model is simple to estimate, it can generate unrealistic predictions about substitution patterns. This is because substitution is proportional to market shares (see Berry (1994)). For example, if Fiat and BMW have the same market share, they would be equally close substitute to Mercedes. In addition, when the market shares of individual products are small, which is often the case in markets involving many products (e.g. say 50 products or more), then the elasticity of individual products hinges on the price level in a counter-intuitive way. The

model predicts that high price products are more elastic than low price products. Alternatively, the expert may consider to estimate the random coefficient model developed by Berry, Levinsohn and Pakes (1995), which is more complex, but also less restrictive than the simple logit model, and as result may provide more realistic predictions.

F.2. Alternative approaches

786. Because estimating a demand model might prove complex and time consuming, and therefore ill-suited to litigation that involves small claims or when the required data are unavailable, it is useful to consider more or less data intensive approaches.

F.3. Survey evidence

787. The expert may consider obtaining evidence on how customer may respond to price change by conducting a survey. Naturally, in this case, individuals who are surveyed will provide a “stated preference” in response to the questionnaire, as opposed to “revealed preference”, which is given by consumer purchasing habits. There are two main categories of stated preference methods: contingent valuation methods (CVM) and choice modelling techniques, which includes discrete choice experiments (DCE).³⁹¹

788. Importantly, to be reliable the survey must sample enough customers to be representative. In its most basic form, the survey questionnaire will ask individuals to indicate how they would react if confronted with a hypothetical price increase.

789. The main downside of this approach is that customers’ response may not actually reflect what they would do in reality. The question is hypothetical, hence customers state what their preference would be in light of a potential price rise. Instead, evidence on actual price changes is typically more compelling, however, they may not be always available.

790. Because producing sound and reliable survey results can be a challenge, notably because questions posed to customers may be confusing or easily misunderstood, surveys ordered for the purpose of litigation should be prepared with care. In particular, because opposing parties have different objectives (all else equal, the claimant would prefer a high elasticity while the defendant’s interests are better served with a low elasticity measure), it

³⁹¹ For more details on survey methods, see Accent and Rand Europe (2010).

might make sense to have the parties to agree on the methodology and the questionnaire.

F.4. Past promotional campaigns or discount policies

791. Looking at past events such as price changes initiated by the purchaser for its products may also help gauge how sensitive its customers are to price changes.
792. In general, firms may undertake promotional campaigns that may have boosted their sales. These historical events can be used to estimate the price elasticity of demand. For example, the firm may have decided to promote a particular product for a week, which may have caused sales to raise. By the same token, the expert may try to gauge the impact of ad-hoc discounts offered to customers, and notably measure by how much sales have been increased. In all cases, the expert may estimate an arc elasticity based on the price and quantity difference.³⁹²
793. In all these cases, the expert examines how a price decrease affects sales, and not a price rise. The underlying assumption is thus that consumers respond symmetrically to a price increase or a price decrease. Indeed, discount or promotional campaigns push price down, with the aim of boosting sales. Consumers might react differently in the event of a price increase.
794. The advantage of this approach is its apparent simplicity. That is, it suffices to identify changes in prices and identify the corresponding change in volume sales. The elasticity can be computed using a few data points.
795. The main drawback of this approach is however that the change in volume sales may be caused by other reasons than just prices. That is, sales may have increased or decreased because of other factors at the same time as prices were lowered. For example the demand of soft drinks is correlated with the weather, and typically increases with good weather. If at the same time, the price of soft drinks is reduced, the expert who estimates the price elasticity of soft drinks would have to correct the measure to account for the impact of the weather on sales. To address this problem, if sufficient data is available, the expert may consider regression analysis to account for the potential influence of these various confounding factors. For example, a

³⁹² The arc elasticity is computed by dividing the percentage change in quantity with the percentage change in price. The percentage change are relative to the mid-point. This is because otherwise the percentage change would depend on the base.

simple model can easily control for seasonality by including dummy variables.

796. Moreover, if the product in question can be stored, such an approach may inflate the price elasticity of demand. This is because consumers may stock the products purchased on promotion, therefore accentuating the change in volume, but not in consumption. In this case the elasticity measure should be adjusted to reflect such consumer behaviour; otherwise in the context of damage estimation, the expert may overstate the volume loss. Indeed, short-run price elasticities are unlikely to be a reliable measure to compute the reduction in sales caused by the infringement. One practical way to deal with this issue consists of aggregating the data so that consumer stocking behaviour do not impact the estimation.³⁹³

F.5. Marketing information

797. To gauge how elastic consumer demand is, the expert may rely on the purchaser internal documents. In general, firms may collect information or documents which may shed light on how customer would react to price change, or at least how the firm perceives how its customers would respond. For example, firms may have used marketing surveys, which may indicate how its customers would behave when confronted with a price increase or a price decrease. These measures might be more or less reliable.
798. The advantage of using marketing information is that typically these documents are readily available, and little to no analysis is required. The main disadvantage is that these documents rarely include a quantitative assessment of customers' price sensitivity. Instead they often provide some qualitative indication about customers' preference. For example, many marketing surveys ask customers to rank which attribute they consider important when selecting a particular product. If price appears as an important selection criterion, the analyst often concludes that customers are price sensitive. However useful, this qualification does not provide any indication about the size of the price elasticity of demand for the product considered. Even though demand is very elastic when the elasticity measure is -3 or -8, choosing either one of these estimates would make a substantial difference when computing the output effect.

³⁹³ This issue also applies to elasticities value that are derived from the parameter estimates of demand model. See also Hendel and Nevo (2006).

F.6. Unit profit margins

799. To obtain a measure of elasticity, the expert may rely on the economic relationship between the percentage profit margin and the price-elasticity of demand. Intuitively, if firms face a very elastic demand, i.e., if consumers are very sensitive to a price change, any price increase would lead to a substantial loss of volume sales. In turn, this prevents firms from raising prices. This is because in this case the trade-off between increased margin and loss sales would lead firms to select prices close to cost. All else equal, a firm whose demand is relatively elastic will thus have a lower margin. Alternatively, firms whose demand is relatively inelastic may raise more easily price above cost, such that margins would be higher.

800. This intuition is formalised by the Lerner condition, which dictates that the percentage unit profit margin is inversely related to the price elasticity of demand. In principle as competition (e.g. with more firms entering the market) intensifies, the Lerner index falls. The logic of the Lerner index applies generally, it is not limited to the Bertrand model of competition. However, the relationship breaks down when firms are engaged in collusive behaviour. As explained by RBB Economics, it is possible to adjust the Lerner index by the price-elasticity of demand to distinguish between markets that have a high margin because demand is inelastic from those that have high margins because they are less competitive. Typically, a very elastic consumer demand leads to a low margin. However if firms are coordinating their pricing strategy, this will raise their margin, all else equal. In such a case, the adjusted Lerner index will be relatively high, reflecting the fact that firms collude in spite of a high elasticity of demand. On the other hand, in the case of a very inelastic demand, even when firms compete, margins remain high. In this situation, the adjusted Lerner index is low reflecting the fact firms compete vigorously.³⁹⁴

801. The main apparent advantage of this approach is that to recover the elasticity of demand the expert just needs to use data on the purchaser's profit margin. However, in practice, this approach is fraught with difficulties.

- Marginal cost is not observed, hence variable costs are often used as surrogate. In theory, variable costs vary with output while other costs are fixed in the short-run. In the long run all costs are variable. In practice, however, there is no clear indicator that separates variable and fixed costs. The scope of variable costs hinges on the definition of the short-run: a few months, a year or more.

³⁹⁴ See RBB Economics (2011).

Annex F – Approaches to estimate elasticity of demand

- In theory, the Lerner condition relates the price elasticity of demand with profit margins based on economic costs. In practice, only accounting costs are available. However, accounting and economic costs need not coincide. In particular, accounting costs omit opportunity costs, which means that margins based on such cost might be artificially inflated.

Annex G – Mechanisms to ensure coherent results between proceedings brought by claimants from different levels in the supply chain³⁹⁵

802. Procedural mechanisms which courts may use to avoid inconsistent results in the assessment of pass-on may be considered as falling within two categories: (i) those aimed at ensuring consistency between parallel proceedings, and (ii) those available to a later court following a ruling of an earlier court. These are considered in turn below.

G.1. Measures aimed at ensuring consistency between parallel proceedings

G.1.1. Measures provided under EU law

803. Article 30 of the Brussels Regulation, related actions, is the procedural mechanism provided under EU law which national courts may use to ensure consistency between parallel direct and indirect purchaser actions.³⁹⁶

804. Under Article 30(1), where a related action in the court first seized is pending at first instance, any other court may stay proceedings retaining jurisdiction. In addition, under Article 30(2) the court second seized may also decline jurisdiction if: (i) the court first seized has jurisdiction over the actions in question; (ii) both actions are pending at first instance; (iii) the law of the court first seized permits the consolidation of both proceedings.

805. As established by the CJEU in connection with the scope of related actions, “[i]n order to achieve proper administration of justice, that interpretation must be broad and cover all cases where there is a risk of conflicting decisions, even if the judgements can be separately enforced and their legal consequences are not mutually exclusive”.³⁹⁷ It would appear that damages actions initiated in different Member States by different levels of the supply chain in relation to the infringement of competition law could be likely to lead

³⁹⁵ This Annex provides a very brief overview of available mechanisms. It is based on a more detailed survey carried out by Cuatrecasas, Gonçalves Pereira, with the support of its Subcontractors, of mechanisms available under national law in the Member States. That survey formed part of the work in preparing this Study but exceeds the scope of this Final Report.

³⁹⁶ While Article 29 (*lis pendens*) also prevents conflicting judgments, it is settled CJEU case-law that this article is only applicable in the case of concurrent proceedings (i.e. proceedings involving the same cause of action and between the same parties; see judgment in *Tatry v. Maciej Rataj*, C-406/92, EU:C:1994:400).

³⁹⁷ Judgment in *Tatry v. Maciej Rataj*, EU:C:1994:400, paragraph 53.

to a risk of “*conflicting decisions*” (particularly if the claims relate to the same precise cartelized product, such that the indirect purchaser claimants in one claim purchased from the direct purchaser claimants in another) and therefore qualify as “related” for the purposes of Article 30.³⁹⁸

806. However, Article 30 grants the court second seized with a wide discretionary power to decide whether to stay proceedings or decline jurisdiction. The factors that may be validly considered and the limits of such a discretion are a matter of EU law on which there is, to date, no CJEU jurisprudence.

807. Given the reference to Article 30 in the preamble and Article 15 of the Directive, national courts may now be more willing to use these procedural tools.

G.1.2. Measures provided under national law³⁹⁹

808. Except in the case of the UK, to date most Member States do not have a specific procedural framework regulating competition law damages actions. As a result, it is the general civil procedural framework and the general rules of evidence and procedure that generally apply at present to competition damages claims in Europe.

809. Some mechanisms generally provided under national law that can potentially be applied by courts to ensure consistency in the case of parallel actions are the following:

- (i) Joinder of proceedings.
- (ii) Third party notices / third party intervention.
- (iii) Related actions / stay of proceedings.

810. The lack of a particular legal framework or established case-law in respect of the substantive application of these mechanisms in competition law cases may cause uncertainty in the application of these mechanisms in most Member States. The development of specific competition law regimes following the implementation of the Directive and/or the increase in the number of cases brought thereunder will certainly help to clarify the existing situation.

³⁹⁸ See Ashton and Henry (2013): ‘Competition Damages Actions in the EU - Law and Practice’, *Elgar Competition Law and Practice series* at page 190.

³⁹⁹ This section has been compiled with the assistance of national law surveys carried out by the Subcontractors of Cuatrecasas, Gonçalves Pereira.

811. Courts should nevertheless engage in active case management so that cases can be dealt with effectively and efficiently. Competition damages claims can involve complex multi-party litigation that may become unmanageable if they are not properly handled. In dealing with these cases, courts may even consider applying *ex officio* any of these mechanisms to the extent possible under national law.
812. Joinder, which is specifically referred to in Recital 44 of the Directive, is potentially the most effective tool in this area.⁴⁰⁰ If the same court can rule on pass-on at the different levels of the supply chain in one joined proceeding, it is generally understood, logically, that the decision will be able to avoid over- or under-compensation. Its application to competition law damages cases, and parallel claims brought by direct and indirect purchasers, will however not be straightforward in most cases and will generally be confronted with difficulties and uncertainties.
813. In some countries such as Croatia, joinder of proceedings is only possible if the proceedings are pending before the same court.⁴⁰¹ In others, such as Finland, the proceedings may need to be conducted pursuant to the same procedural rules⁴⁰² or, as in Hungary, joinder could be subject to the court's discretion.⁴⁰³ Issues related to the manageability of proceedings and procedural efficiency will certainly play a role in the courts' mind when dealing with these decisions.
814. Similar to joinder of parties, albeit on a much broader scale, collective redress mechanisms may assist courts in ensuring consistency between judgments. This is particularly the case for opt-out class actions in which findings of pass-on will formally bind all the members of the class even if they are not party to the proceedings and, even more so, if it were possible to consolidate in one collective proceedings claimants from different levels (such as is the case at times in the US and Canada).
815. The European experience in collective actions is very limited of course even in "straightforward" one level cases, and accordingly there is no relevant experience touching on these types of complex situations. Nevertheless, the new UK collective regime may provide an interesting laboratory. It is, indeed, foreseen by practitioners and judges as a possibility that direct and indirect purchaser actions could be brought together, although it remains to

⁴⁰⁰ Indeed, the Commission noted in its White Paper at paragraphs 222-224 that when actions by direct and indirect purchasers in the same supply chain are brought or are subsequently joined before the same court to be conducted in a single proceeding, ensuring consistency is relatively straightforward.

⁴⁰¹ See Article 313 of the Croatian Civil Procedure Act.

⁴⁰² See Chapter 18, Article 7 of the Finnish Code of Civil Procedure.

⁴⁰³ See Section 149(2) and (3) of the Hungarian Code of Civil Procedure (Act No. III of 1952).

be seen how the process could be managed in practice given potential conflicts between parties.

816. A practice that has developed during the last years (and which is captured by Article 2(4) of the Directive) is the assignment of claims. Under this practice, competition damages claims are bought by special purpose vehicles which subsequently file them together before the same court. Good examples of this practice are the actions filed by the special purpose vehicle Equilib against the Air Cargo Cartel in The Netherlands or by CDC against the Cement Cartel in Germany. As collective actions, the assignment of claims is a mechanism which can ensure consistency between what would otherwise have been parallel actions. To date, however, all reported cases in which assignment of claims are present consisted of claims at the same level of the supply chain. From a legal perspective, it is uncertain whether EU or national law would accept collective actions brought by special purpose vehicles assigned with both direct and indirect purchasers' claims.

817. Together with collective redress mechanisms and the assignment of claims, the creation of specialized courts such as the UK CAT is a means to ensure consistency and avoid overcompensation.⁴⁰⁴ Under its current regime, there is potential now for centralizing competition damages claims in that forum as most actions can now be brought or transferred there, including opt-out class actions. It is foreseen that the CAT will be able to contribute considerably to overall consistency in the allocation of damages between the different levels of the supply chain.

818. Together with these mechanisms, all Member States allow some form of third party intervention. This type of intervention can also ensure consistency between judgments. While some Member States allow the intervener to act as an independent party,⁴⁰⁵ others only allow them to act in support of a party to the proceedings.⁴⁰⁶ In both cases, the general consequence is that the intervener will not be able to re-litigate its case or the issue in support of which it intervened (e.g. pass-on) and will be bound by the courts' determination. This is known as the "intervention effect". In some countries such as Austria and Croatia providing third parties with notice of the proceedings is sufficient to trigger the intervention effect even if they subsequently do not join the proceedings.

819. If full intervention is allowed, a direct purchaser may intervene to have its case tried together with the indirect purchasers or *vice versa*. If intervention

⁴⁰⁴ It is worth noting that Sweden is also considering the creation of a specialized tribunal for competition damages actions.

⁴⁰⁵ See Article 15 of the Belgian Judicial Code.

⁴⁰⁶ See for example Article 218 of the Bulgarian Code of Civil Procedure.

is limited to support a party's position, then it may be possible under national law for direct purchasers to join as co-defendants with infringers to defend that there has not been pass-on and, *vice versa*, it may be possible for indirect purchasers to support the infringer in its proceeding *vis-à-vis* the direct purchasers to support that there has actually been pass-on. In both cases the intervention effect will contribute to ensuring consistency between these and the judgments that will follow them.

820. Finally, rules on stays or related actions tend to follow the same approach as the rules provided for under the Brussels Regulation. That is, if a national court understands that its proceedings (concerning, for example, an indirect purchaser claim) is related to another pending proceeding (for example, an earlier action at the direct purchaser level relating to the same infringement), it may decide, under its discretion, to stay its proceedings. In some Member States, staying for related actions only applies insofar as joinder of proceedings is not possible.⁴⁰⁷

G.2. Measures aimed at ensuring consistency where there is a prior decision

G.2.1. Measures provided under EU law

821. The courts of a Member State may recognize the binding effect of a judicial decision rendered in another Member State, in proceedings pending before it, pursuant to Article 36(1) of the Brussels Regulation. An interested party may oppose the recognition of a judicial decision rendered by the courts of another Member State if such decision is irreconcilable with another judicial decision given between the same parties in the Member State addressed (Article 45(1)(c)). Article 45(1) seeks to prevent the existence of irreconcilable judicial decisions rendered in cases between the same parties in the territory where the Brussels Regulation applies.

822. The right of an interested party to invoke incidental recognition of a judicial decision rendered in another Member State (see Article 36(3) of the Brussels Regulation) only plays a role if the interested party is alleging the binding effect of the judicial decision. If no binding effect is intended (e.g. if the party intends to present the judgment as evidence of facts) recognition does not seem necessary. A party could decide simply to invoke the foreign judicial decision as a fact or document that the judge of another Member State may consider relevant according to its rules of evidence and procedure,

⁴⁰⁷ For example, Spain.

subject always to the effect that Article 15(1) of the Directive seeks to achieve.

823. Considering that Articles 36(3) and 45(1) of the Brussels Regulation extend the binding effects of judicial decisions only to proceedings between the same parties, the importance of these two provisions as tools to ensure consistency between decisions filed by different claimants in different Member States related to the same infringement of competition law may be somewhat limited in practice. The coordination envisioned by the Directive may therefore only be effectively achieved in practice by virtue of Article 30 of the Brussels Regulation under EU law.

G.2.2. Measures provided under national law

824. Member States ensure consistency between judgments and avoid conflicting decisions with the principle of *res judicata*. However, in general, findings of pass-on will only have binding effect between those who were parties to the proceedings and, in some countries such as Austria and Croatia, to those who could have intervened in them but chose not to.

825. Despite not having binding effect, Member States' courts generally would allow parties to refer to these judgments which may be presented as evidence to be taken into account together with the other evidence in the case. In some countries, in certain circumstances, judgments may be considered as qualified evidence which is given greater probative value than other types of evidence in the case.⁴⁰⁸

826. It is important to note, however, the reluctance of courts to consider themselves bound by decisions in other related proceedings and their duty to consider all evidence adduced before them, such that it is not at all strange that a second court could come up with a different solution to the same problem, if it had reasons to do so.

⁴⁰⁸ This is particularly the case in Cyprus, Finland, Greece, Malta, Spain and Sweden.

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Appendix – List of Subcontractors

Law firm	Contributing lawyers	Jurisdiction
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Arendt & Medernach	Philippe-Emmanuel Partsch Thomas Evans	Luxembourg
Barents Krans	Martijn van Maanen Joost Fanoy Tim Raats	Netherlands
Chiomenti Studio Legale	Stefania Bariatti Emilio Cucchiara Giovanni Pregno	Italy
Haver & Mailänder	Dr. Ulrich Schnelle Dr. Volker Soyeze	Germany
Magnusson	Denis Piskunov Kati Pino	Estonia
	Rūdolfs Eņģelis Valts Nerets Jānis Zuļķis	Latvia
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	Luka Čolić	Croatia
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	János Tóth Gábor Bárdosi Zoltán Bánki	Hungary
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	Claudia Chiper Ana Georgia Mirea	Romania

Wolf Theiss	Ľuboš Frolkovič Marián Šulík	Slovakia
	Klemen Radosavljevič Tjaša Lahovnik	Slovenia

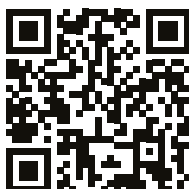
ABSTRACT

This Study is intended to provide judges, and other practitioners who are not economic experts, with practical guidance on obtaining and assessing economic evidence in relation to pass-on claims arising from competition law infringements. Drawing on relevant economic theory and quantitative methods, as well as relevant legal practice and rules, it sets out a framework for evaluating the plausibility of pass-on claims, for quantifying the effects of pass-on, and, accordingly, for assessing the extent of the harm suffered by a claimant. The Study reviews the principal factors that are predicted to affect the extent of the passing-on effect and the associated volume effect. It also presents a number of different empirical approaches to quantifying the contributions of these effects to the harm suffered, identifying the key parameters that need to be estimated and the corresponding data requirements. The Study offers too some practical guidance on managing the legal process of adducing and assessing relevant economic evidence. Finally, it proposes a checklist of issues organised around a set of 39 questions, which is designed to provide judges and practitioners with a practical tool to assist in the assessment of economic evidence in relation to pass-on.



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KD-KD-02-16-916-EN-N

doi 10.2763/590101