International
Comparative
Legal Guides

Practical cross-border insights into product liability

Product Liability 2022

20th Edition

Contributing Editors:
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Price Premium Damages in Product Market Litigation: Issues in Survey-Based Market Simulations


Lisa Cameron


Daniel McFadden


Pablo Robles

The Brattle Group

I Introduction[1]

In many recent consumer class actions, Plaintiffs have alleged that buyers were owed damages due to a company's misrepresentation of the attributes associated with its product. These alleged damages can arise when some buyers would have been unwilling to pay the old price for a product revealed to have attributes different to those previously represented or inferred.[2] The damages (if any) arising in such situations are sometimes called "benefit-of-the-bargain" damages.[3]

In determining benefit-of-the-bargain damages, courts often employ a market price premium standard.[4,5] Under this standard, damages are defined as the difference between (i) the market price for the product in the actual world in which the product was sold with the misrepresentation; and (ii) the market price for the product in the "but-for" world in which the misrepresentation is disclosed at the time of purchase.[6,7,8]

When observed actual-world market data are available and sufficient, the expert can assess price premium damages using various statistical techniques such as a "difference-in-difference", "hedonic regression", or "synthetic control" analysis. At a high level, these techniques allow for the assessment of price premium damages through a comparison of the at-issue product's price **with** and **without disclosure**. In order to avoid confounding the impact of the alleged misrepresentation with extraneous factors, these types of statistical analyses must be conducted in accordance with rigorous scientific standards.[9] However, when performed carefully and with adequate data, these analyses provide the best means of evaluating the existence of market price premiums (if any).

In some cases, Plaintiffs' experts have attempted to substitute for or supplement observed actual-world data with data obtained from surveys in which consumers are asked to state their choices among hypothetical profiles of products described by their attributes; these surveys are often referred to as **choice-based conjoint** ("CBC") surveys. For example, some Plaintiffs' experts have claimed that it is necessary to use CBC survey data in determining the market price premium if the at-issue product is immediately withdrawn from the market after disclosure because the actual-world price of the product with disclosure is never observed.

Because CBC surveys provide data on consumer choices among hypothetical product profiles, they have the potential to provide information on consumers' preferences for certain product features that might otherwise be challenging to identify from actual-world market data. In principle, experts can use this consumer preference information to estimate demand for a product in the but-for world.[10] However, it is important to recognise that the academic literature has set forth stringent requirements for the design and execution of a CBC survey that is intended to generate valid demand estimates.[11] Many Plaintiffs' experts have failed to follow these requirements. Moreover, even if that were not the case, one of the key points of this chapter is that it is generally impossible to determine price premium damages without incorporating these demand estimates into an economically sound market simulation model.

This chapter focuses on the issue of using market simulation models to calculate price premium damages when demand estimates are derived from CBC survey data. In this context, an economically sound market simulation model is a set of equations that – when estimated and solved – provide the equilibrium prices at which each consumer maximises utility and each seller maximises its profits (given demand, costs, and potential responses from competitors). As our chapter describes in detail, many Plaintiffs' experts in product misrepresentation cases have proffered survey-based market simulation models that do not adhere to this framework and therefore fall short of the intellectual rigour that characterises the practice of economists in this field.

Indeed, our main purpose in writing this chapter is to explain a critical problem common to many of these asserted market simulation models – i.e. their estimates of but-for world prices fail to reflect the behaviour of willing buyers and willing sellers because they do not take the supply side of the market into account.[12] In the last several years, judges have rejected these economically unsound market simulations in a number of matters involving alleged product defects.[13] However, the *MyFord Touch* decision is a notable exception.[14] Moreover, the issue remains controversial in cases involving claims of product mislabelling.[15]

Our chapter begins by explaining how Plaintiffs' experts have used CBC surveys to estimate demand for the at-issue product (as well as competing products) in the actual and but-for worlds. It then describes how demand estimates – when obtained from an economically and statistically sound CBC survey – can (in principle) be incorporated into an economically sound market simulation model that determines market prices from the interaction of willing buyers (who generate demand) and willing sellers (who generate supply).

Next, we discuss how the asserted survey-based market simulation models proffered by some Plaintiffs' experts in past consumer class actions have failed to correctly account for the behaviour of willing buyers and willing sellers. We explain that such models will produce unreliable damage figures, even assuming that their CBC survey-based demand analyses were designed and executed in accordance with relevant scientific and technical standards (an extremely challenging exercise). Finally, we provide some brief conclusions.

II Conceptual Overview of an Economically Sound Survey-Based Market Simulation Model

As noted above, when Plaintiffs' experts use market simulation models in consumer class actions, they often rely on CBC survey data to simulate consumers' demand for the at-issue product in the actual world (without disclosure) and in the but-for world (with disclosure).[16]

In Section IIA, we provide a very simple example of the types of CBC surveys that Plaintiffs' experts have used to obtain information on consumer demand, both for the at-issue product and for relevant competing products. While we believe it is useful to review this simple example for illustrative purposes, it is important to recognise that designing and conducting a CBC survey that can be used to reliably predict demand in real-world markets is a significant scientific and technical undertaking. Moreover, there is academic literature that addresses the complex rigours associated with the design and execution of such surveys in some detail, and the failure to take into account the prescriptions of this literature will render any output from the CBC survey unusable for the purposes of accurately determining demand in a but-for market.[17]

In Section IIB, we continue to abstract away from the complexities involved in designing and executing a reliable analysis of demand based on CBC survey data and assume that this analysis has been carried out correctly. We then provide a conceptual overview of how, in principle, a survey-based market simulation model that combines the CBC analysis of demand with supply-side information on costs and competitor interactions can be used to generate the components of price premium damages.[18,19]

A CBC surveys and consumer demand

In order to explain how some Plaintiffs' experts have used CBC survey results to determine consumer demand, we consider a highly simplified illustrative example from the apparel industry. In our illustrative example, we focus on two different manufacturers (Firms Axe and Blaze) that make two different types of denim jeans, product *A* and product *B* respectively. Each product is assumed to have been available on the market for several years. In year 6, however, Firm Blaze discloses that product *B*, which was initially marketed as being "Made in USA", was actually manufactured in Asia.[20]

We further assume that a putative Class of previous buyers files suit against Firm Blaze, the manufacturer of product B. The putative Class alleges that Firm Blaze – despite knowing about the manufacturing location for several years in advance of the disclosure – nonetheless marketed product *B* as having been Made in USA. As a result, Plaintiffs claim that there is a period in which pre-disclosure purchasers overpaid for product *B*.

As stated above, price premium damages (if any) are calculated as the difference between (i) product *B*'s actual-world market price and (ii) product *B*'s but-for world market price during the period in which the manufacturing location was allegedly misrepresented. The actual-world market price is the price that was paid for product *B* when it was believed to have been Made in USA. In contrast, the but-for world market price is the price that would have been paid for product *B* if consumers had been aware that product *B* was not Made in USA before (or at the time that) product *B* was purchased.[21]

The role of the CBC survey in this analysis is to assess demand for the at-issue product (in this case, product *B*) – as well as key competitor products (in this case, product *A*) – in the actual and but-for worlds. The information on competitor products is critical because it is needed to determine demand for the at-issue product in the (simulated) actual and but-for worlds.[22]

The remainder of this section describes – at a very high level – the steps required to obtain this demand-side information, which is critical input for an economically sound market simulation model.

First, the expert breaks down the relevant products in the market (here, denim jeans) into the constituent features that consumers value, referred to as attributes.[23,24] The attributes, in turn, can take on different values or levels. In the very simple illustrative example below, denim jeans are assumed to have five attributes, with each attribute's potential levels listed in parentheses: (i) brand (Axe and Blaze); (ii) price (a continuous attribute with a range of levels typically observed in the market for denim jeans); (iii) colour (medium blue, faded blue, dark blue); (iv) fabric (light, medium, heavy); and (v) "Made in USA" claim (yes and no).

Second, the expert creates multiple-choice tasks composed of product profiles that have different levels of the same attributes; Figure 1 presents one such choice task. The CBC survey respondent's job is to choose his preferred product profile from those offered in the choice task **or** forego the purchase (choosing what is sometimes referred to as a no-buy option).[25,26,27]

Figure 1: Example of a hypothetical choice task

Stage 1

Attribute	Choice 1	Choice 2	Choice 3	Choice 4
Brand	*Blaze*	*Axe*	*Blaze*	*Blaze*
Colour	Medium Blue	Faded Blue	Medium Blue	Dark Blue
Fabric	Light	Heavy	Light	Medium
Made in USA	No	No	Yes	Yes
Price	$45.00	$50.00	$55.00	$60.00
Which of these jeans would you choose?				

Stage 2

	Yes	No
Would you buy the chosen jeans?		

Third, after creating the CBC survey, the expert will administer it to a sample of respondents; in order to be statistically sound, this sample must be representative of the target population.[28] Typically, CBC surveys are administered online and respondents are required to perform between 12 and 20 choice tasks. To maximise the information on consumer preferences derived from each survey respondent, the expert varies profile attribute levels across choice tasks, causing the survey respondent to change his product choice in response.[29] Each respondent–task combination provides a data point for the analysis. Hence, if 1,000 respondents take the survey and each respondent makes 20 choices, there will be 20,000 data points in the analysis.

Fourth, after collecting the CBC data, the expert typically performs a statistical analysis – which, as noted previously, is referred to as "conjoint analysis" – to estimate the parameters of the demand curves for the at-issue product and relevant competing products in both the actual and but-for worlds. In this simple example, the CBC data are used to obtain economically sound demand estimates for the at-issue product (product *B*) and its competitor (product *A*) in both worlds.[30]

It is important to recognise that the demand that a producer faces in a given world will depend on the attribute levels of its product, as well as the price and attribute levels of relevant competing products.[31] It will also depend on parameters that are referred to in the conjoint literature as "part-worths". Part-worths are akin to regression coefficients associated with each attribute level. They measure how much each attribute level contributes (either positively or negatively) to a survey respondent's valuation of the product and thus to the ultimate purchase decision.[32,33]

In sum, this section has outlined a few of the basic steps involved in the design and execution of a CBC survey that is intended to generate economically sound demand estimates. We note that a reliable CBC survey must include, among other things: (i) the product at issue as well as relevant competitors; (ii) key product attributes that consumers take into account when making their purchase decisions; and (iii) a "no-buy" option. We have also explained that CBC surveys intended for this purpose must meet numerous other stringent requirements outlined in the relevant economic and statistical literature and refer the reader to this literature for an in-depth discussion of these requirements.[34]

In principle, an expert who has addressed these stringent requirements may (depending on the specific issue of the case) be able to generate the data she needs to estimate demand for all relevant products in the market (including the at-issue product) in both the actual and but-for worlds.

B Conceptual overview of market simulation model: combining demand with supply

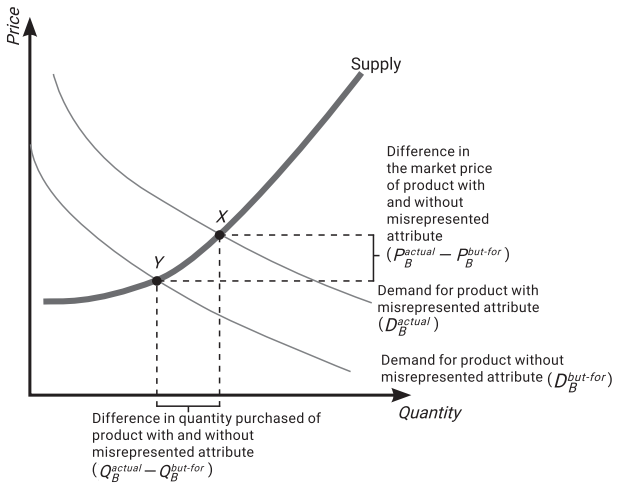
In this section, we provide a conceptual explanation of how information on demand for the at-issue product can be incorporated into an economically sound market simulation model to generate the components of price premium damages.[35,36] To provide this conceptual explanation, we use the traditional demand and supply curve analysis presented in basic economic textbooks.[37] Together, the supply and demand curves determine the price and quantity of a good that will be bought and sold in a market. In particular, the point at which the demand and supply curves cross dictates the market (or market equilibrium) price for the good.[38]

As discussed further below, if a CBC demand analysis has been conducted appropriately, an economically sound market simulation model can (in principle) produce a but-for world price that correctly reflects the utility-maximising decisions of willing buyers and the profit-maximising decisions of willing sellers. Price premium damages can then be measured as the difference between the at-issue product's price in the actual and but-for worlds.

1. Graphic illustration

Figure 2 below illustrates how a market simulation works at a conceptual level; it considers the impact of the hypothetical disclosure with respect to the Made in USA claim in our simple jeans example. In Figure 2, the actual-world demand curve for product *B* is labelled D_B^{actual}. The actual-world market equilibrium price for the product is determined by the intersection of D_B^{actual} with the supply curve for the product. This intersection occurs at point *X* and the resulting market equilibrium price is labelled P_B^{actual}. In principle, P_B^{actual} can be observed in the marketplace. However, one must perform an analysis to determine the supply curve and the demand curve for the product without the challenged claim ($D_B^{but\text{-}for}$), as well as their intersection at $P_B^{but\text{-}for}$. $P_B^{but\text{-}for}$ is the market equilibrium price for product *B* with the disclosure that it is not Made in USA.

Figure 2: Hypothetical market equilibrium prices for product B under actual-world and but-for world equilibrium conditions



In order to illustrate how the but-for world market equilibrium price is determined in our hypothetical jeans example, we assume that the but-for world disclosure that the product is not Made in USA causes consumers to value the product less.[39] As a result, the demand for product *B* drops from D_B^{actual} to $D_B^{but\text{-}for}$. We also make the simplifying assumption that – while the demand curve shifts in the but-for world – the supply curve does not.[40] Thus, the researcher seeking to determine $P_B^{but\text{-}for}$ must estimate the but-for demand curve for product *B* ($D_B^{but\text{-}for}$).

The new market equilibrium price is determined by the intersection of the existing supply curve and $D_B^{but\text{-}for}$ at point *Y*. In our hypothetical example, the market equilibrium price for product *B* with the disclosure that the product is not Made in USA is given by $P_B^{but\text{-}for}$. Thus, the market equilibrium price differential is determined by the difference between P_B^{actual} and $P_B^{but\text{-}for}$. As this simple example makes clear, it is necessary to determine the (new) but-for demand curve ($D_B^{but\text{-}for}$), and where it intersects with the supply curve relevant to the but-for world[41] in order to solve for the at-issue product's new (but-for) market equilibrium price.

2. The role of willing buyers and willing sellers

It is a fundamental principle of economics that any market price is determined by the interaction of willing buyers (who maximise utility) and willing sellers (who maximise profits).[42] This same principle applies to the but-for world market price produced by an economically sound market simulation.[43] When the correct manufacturing location is disclosed at the point of sale, this simulation allows all firms (including both the at-issue firm and its competitors) to choose how many jeans they will offer for sale, independent of how many jeans they sold in the actual world without disclosure.[44]

In fact, Figure 2 shows that, in the but-for world, Firm Blaze will likely reduce the amount of product *B* that it supplies to the market (relative to actual-world levels), given the lower price that consumers are willing to pay for product *B* (with its now disclosed non-US manufacturing location).[45,46] This is why – in a market with willing buyers and willing sellers – there is often a quantity reduction associated with the correction of the challenged claim; in this case, the reduction in quantity is $Q_B^{actual} - Q_B^{but\text{-}for}$. Likewise, an economically sound market simulation allows all consumers to choose whether or not to buy an at-issue pair of jeans, a competitor's jeans, or no jeans at all independent of how many jeans those consumers purchased in the actual world, in which the correct manufacturing location was not disclosed at the time of purchase.[47]

III Purported Survey-Based Market Simulations Based on Unreliable Economic Analysis

In the prior section, we explained that, in principle, conjoint analysis can be used to estimate actual and but-for world demand curves for the at-issue products as well as the actual and but-for world demand curves for relevant products in the market. We also noted that the academic literature has set forth stringent requirements for the design and execution of a CBC survey that is designed to generate valid demand functions. Under the assumption that these stringent criteria have been met, we used a simple illustrative example to provide insight into how an economically sound market simulation can effectively combine these demand curves with supply-side information to produce the data required for price premium damages.[48]

In many past product misrepresentation cases, however, experts have generated unreliable damages analyses based on either (i) conjoint analysis alone; or (ii) conjoint analysis in combination with unsupported and economically unrealistic assumptions about the supply side of the market and consumer preferences. Below, we review some of the faulty logic underpinning these purported survey-based market simulation models and discuss how these models have been addressed in recent legal decisions.

A Unsound market simulations and unreliable damages estimates based on conjoint analysis alone

In a number of prior cases, Plaintiffs' experts sought to determine damages based solely on part-worths obtained from conjoint analysis. To the extent that these experts have attempted to characterise this analysis as a survey-based market simulation, it is clearly an economically unsound market simulation that will produce unreliable results (even if one were to assume that the CBC analysis itself was designed and implemented in accordance with relevant scientific standards).

In these cases, damages are based solely on a measure referred to as consumer willingness to pay ("WTP") for the misrepresented attribute. Recall that, in our jeans example, the misrepresented attribute of the product is that it was Made in USA. One can calculate the consumer's WTP for the attribute by dividing (i) the part-worth of the Made in USA attribute (i.e. with a level of 1 instead of 0) by (ii) the negative of the part-worth of price.[49,50,51] Essentially, the consumer's WTP for the attribute Made in USA tells us how much the consumer is willing to pay for that attribute.[52]

For a given consumer, the difference between the WTP for a product **with** a misrepresented attribute and the WTP for a product **without** a misrepresented attribute is going to be equal to the **WTP for the misrepresented attribute**. However, this latter WTP is not equivalent to a market price because it only reflects demand-side considerations. In contrast, a market price reflects demand for the product as a whole (not just the attribute level of interest) and the demand for competitor products, as well as supply-side considerations such as production costs and the prices of competitors' products.

As discussed above, it is a fundamental principle of economics (akin to gravity in physics) that market prices arise from the interactions of willing buyers (who generate demand) and willing sellers (who generate supply).[53] Figure 2 above illustrates this fundamental economic principle graphically, showing how the interaction of supply and demand produces actual and but-for market prices for the product at issue. Because market prices are generated by the interaction of supply and demand, CBC survey results cannot be used – on their own – to determine but-for market prices.[54,55]

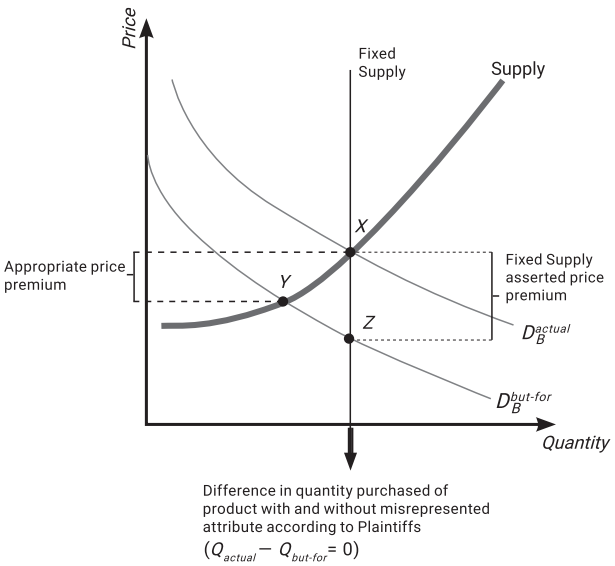
Consistent with this fundamental economic tenet, a number of recent court decisions reject the notion of relying on conjoint analysis **alone** to evaluate the price premium arising from an allegedly deceptive product label or undisclosed product defect. These include, for example, the *Zakaria v. Gerber Decertification* decision;[56] the *Whirlpool Decertification* decision;[57] and *In re NJOY*.[58] In general, these decisions recognise the fundamental economic principle that market prices are determined by the interaction of supply and demand, while conjoint analysis provides certain information on the demand side of the market, only.

B Unsound market simulations and unreliable damages analyses based on conjoint analysis combined with unsupported assumptions about the supply side of the market

In contrast to the economically sound market simulation depicted in Figure 2, some Plaintiffs' experts have put forward purported survey-based "market simulations" predicated on a market in which the quantity of products supplied is a known quantity and "fixed as a matter of history". For example, in the GM ignitions matter, the Plaintiffs' expert explicitly assumed that: "The number of vehicles that were supplied without disclosure in the actual-world is identical to the number of vehicles supplied in the but-for world where the defect was disclosed and for which economic losses have to be computed."[59] Below, we provide additional perspective on this type of analysis, which will produce unreliable results – even if one were to assume that the expert conducted her CBC survey and obtained demand estimates from that survey data in accordance with relevant scientific standards.

Figure 3 below provides a conceptual illustration of the but-for world construct that these experts have sought to implement, using our hypothetical jeans example. It shows that this but-for construct is tantamount to assuming – without evidence – a supply curve that is (i) anchored at the quantity of jeans sold in the actual world; and (ii) completely insensitive to changes in price (and is therefore vertical as opposed to upward sloping). However, the deployment of this construct without empirical evidence or support is economically unsound.[60,61]

Figure 3: Hypothetical price premium under inappropriate vertical supply curve assumption



It is also important to recognise that the assumed existence of a vertical supply curve (anchored at the level of quantity sold in the actual world) will tend to result in an overestimate of the market price premium, as illustrated in Figure 3. Figure 3 shows that the initial actual-world equilibrium occurs at point *X* (where the supply curve intersects with the actual-world demand curve (D_B^{actual})). An economically sound market simulation would identify the new equilibrium price and quantity from the intersection of the upward-sloping supply curve with the but-for demand curve ($D_B^{but\text{-}for}$). In Figure 3, this economically sound market equilibrium occurs at point *Y*.[62]

By holding quantity supplied fixed – as represented by a vertical supply curve in Figure 3 – Plaintiffs' asserted "market equilibrium" occurs at point *Z* (where the Plaintiffs' assumed vertical supply curve intersects with the but-for demand curve $D_B^{but\text{-}for}$). In this case, Plaintiffs' asserted "price premium" is given by the vertical difference between points *X* and *Z*. It is easy to see that Plaintiffs' asserted "price premium" under the unsound vertical supply assumption (the vertical distance between *X* and *Z*) will tend to exceed the market price premium from a sound market simulation (the vertical distance between *X* and *Y*).

Thus far, we have explained that a survey-based "market simulation" in which supply is assumed to be fixed in the absence of any evidence will tend to overstate the market price premium. Moreover, in contrast to an economically sound market simulation – where the but-for market equilibrium price is determined by willing buyers maximising utility and willing sellers maximising profits – this "fixed supply" approach does not allow both sellers to maximise profits and consumers to maximise utility.

Instead, this unsupported approach wrongly forces suppliers to sell the same number of jeans under both actual and but-for world conditions, despite the fact that disclosure of the alleged misrepresentation would cause the competitive landscape to change. This is why Figure 3 shows that under the Plaintiffs' unsound construct, there is no difference between the quantity of jeans sold before and after disclosure of the alleged misrepresentation – i.e. $Q_{actual} - Q_{but\text{-}for} = 0$. This lack of difference is economically unjustified; there is no reason to believe that sellers would be willing to accept the lower prices that consumers require to make this many purchases under the new conditions.[63]

Consistent with the economic reasoning explained above, recent court decisions have rejected the unsupported assumption that supply is "fixed as a matter of history" for estimating the price premium arising from an allegedly undisclosed product defect or deceptive product label. For example, in the GM decision, Judge Furman found that the Plaintiffs' expert "… did not estimate any possible changes in New GM's willingness to sell a car with a known, acknowledged and disclosed defect – instead, he [Plaintiffs' expert] assumed that 'the new equilibrium [i.e. market] price' in the but-for world would be the same at which 'all the purchasers of defective vehicles in the actual-world would also buy in the but-for world'". Finding that this analysis did not suffice to establish damages, Judge Furman explained that: "The benefit-of-the bargain [**191] theory awards damages based on the difference between what the plaintiff paid for and the fair market value of what the plaintiff received."[64] Judge Furman further explained that "fair market value is determined according to the equilibrium price of a good … and the equilibrium price depends on supply and demand". He also pointed out that the Plaintiffs' expert "straightforwardly admits that he did not inquire into New GM's willingness to sell".[65]

Finally, it is worth noting that some Plaintiffs' experts have argued against using a market price premium because it would not fully compensate consumers who forego purchasing the at-issue product in the but-for world without the misrepresentation. However, identifying which consumers require this additional compensation is not feasible in a class action context. Even if Plaintiffs were successful in demonstrating that the price premium identified in a particular case was a common component of damages, determination of harm to individual buyers in addition to these price premium damages requires individual evidence. It is important to recognise that efforts to quantify such additional harm and distribute it across all buyers are antithetical to the class action concept of common harm established using common evidence.

IV Conclusions

Calculating damages in product misrepresentation cases is a complex undertaking that requires the economic expert to determine the price at which consumers would have purchased the product in the but-for world without the misrepresentation at the time of purchase. When observed actual-world data are not available to address this issue, an expert seeking to determine but-for world prices may be able to determine these prices using an economically sound analysis of demand based on CBC survey data as an input into an economically sound market simulation model.

Economically sound market simulation models take into account both the demand and supply side of the product's market in a way that is consistent with fundamental economic principles. However, a number of Plaintiffs' experts have incorrectly claimed that they can calculate this but-for world price using either demand-side information alone, or by combining demand-side information with the assumption that the supply side of the market is fixed as a matter of history. In some cases, courts have accepted this flawed application of economics, rendering decisions that are inconsistent with sound economic analysis.

More recent court decisions have correctly acknowledged the need to account for both the demand and supply sides of the market when calculating price premium damages. However, the design and execution of the conjoint analysis that is a key input into a survey-based market simulation model presents many challenging issues. Moreover, the market simulation models required to obtain economically sound estimates of but-for world prices (and hence price premium damages) from survey-based demand estimates are extremely complex. Hence, it is critical that the experts who carry out these analyses have extensive experience in performing them in accordance with rigorous scientific standards in order to ensure that the results are reliable and valid.

Endnotes

1. The views and opinions expressed in this chapter are strictly those of the authors, and do not necessarily represent the views or opinions of The Brattle Group or any of its other employees or clients. Please note that Brattle has worked on and participated in some or part of the cases mentioned in this chapter. Readers of this chapter should seek independent expert advice regarding any information in this chapter and any conclusions that could be drawn from this chapter. The chapter itself in no way offers to serve as a substitute for such independent expert advice. Brattle, along with its respective directors, officers, and employees, shall not be liable for any errors, omissions, defects, or misrepresentations in the information contained in this chapter, whether intentional or unintentional, or for any loss or damage suffered by persons who use or rely on such information or any conclusions that could be drawn from the chapter.
2. These product misrepresentation cases typically arise in two different contexts, product defect matters and product mislabelling matters. In product defect matters, Plaintiffs claim that Defendants misrepresented the product as being free of the at-issue defect, causing consumers to overpay for the product. Some product mislabelling matters also follow this pattern; Plaintiffs claim that the Defendants misrepresented the product as being free of a chemical or additive, causing consumers to overpay for the product. In other product mislabelling matters, Plaintiffs claim that Defendants have misrepresented the product as having some positive feature that it does not possess, again causing consumers to overpay for the product.
3. "As its name suggests, the benefit-of-the-bargain theory seeks to compensate a plaintiff who did not get what she bargained for." *See* In re GM LLC Ignition Switch Litigation, 407 F. Supp. 3d 212, (S.D.N.Y., Aug. 6, 2019) ("GM1"), LEXIS 132052, at HN6.
4. *See*, e.g., GM1 at **163 and In re GM LLC Ignition Switch Litigation, *Opinion and Order*, Case No. 14-2543 (S.D.N.Y., Dec. 12, 2019) ("GM2") at 13; *see* also In re NJOY, Inc. Consumer Class Action, No. 14-428, 2016 U.S. Dist. LEXIS 24235, at *17–20 (C.D. Cal. Feb. 2, 2016) ("In re NJOY"), Oula Zakaria v. Gerber Products Co., No. 15-200, 2017 U.S. Dist. LEXIS 221124, at *48–51 (C.D. Cal. Aug. 9, 2017) ("Zakaria v. Gerber Decertification Decision"), Nancy Lanovaz v. Twinings North America, Inc, No. 12-2646, 2014 U.S. Dist. LEXIS 57535, at *21–22 (N.D. Cal. Apr. 24, 2014) ("Lanovaz"), Toby Schechner, et al. v. Whirlpool Corporation, No. 16-12409, 2019 U.S. Dist. LEXIS 31704, at *16 (E.D. Mich. Feb 28, 2019) ("Whirlpool"), Riley Johannessohn, et al. v. Polaris Industries, Inc., No. 16-3348 (D. Minn. Mar. 31, 2020) (order denying class certification) ("Polaris") at 43.
5. This price premium is sometimes called an overcharge.
6. Note that in product defect cases, damages may be measured as the lower of the cost of repair and the difference in market price. *See* GM1 at *230–231.
7. As explained in the chapter, the market (or market equilibrium) price is the only price at which the amount of product that consumers want to buy (quantity demanded) is equal to the amount that producers want to sell (quantity supplied); this common quantity is called the market equilibrium quantity.
8. Employing standard terminology, here we use the term "actual-world price" to refer to the market prices actually paid by purported class members and we use the term "but-for world price" to refer to the market equilibrium prices that would exist if the alleged defect or misrepresentation had been disclosed at the time of purchase. We use the term "market price differential" to refer to the difference (if any) between the actual-world market price and the but-for world market price. *See*, e.g., Allen, M., Hall, R., and Lazear, V., "Reference Guide on Estimation of Economic Damages", in Reference Manual on Scientific Evidence (Federal Judicial Center, National Research Council of the National Academies) (2011), p. 432.
9. These standards are discussed extensively in the economic literature. *See*, e.g., Angrist, J.D., and Krueger, A.B., "Chapter 23 – Empirical Strategies in Labor Economics", in Handbook of Labor Economics, Elsevier, Volume 3, Part A, 1999, pp. 1277–1366, *and* Hartman, R.S., and Doane, M.J., "The Use of Hedonic Analysis for Certification and Damage Calculations in Class Action Complaints", The Journal of Law, Economics, and Organization, Volume 3, Issue 2, Fall 1987, pp. 351–372, https://doi.org/10.1093/oxfordjournals.jleo.a036935. *See also* Abadie, Alberto (2021), "Using Synthetic Controls: Feasibility, Data Requirements, and Methodological Aspects". Journal of Economic Literature, 59 (2): 391–425.
10. As explained in the chapter, an expert who seeks to use a survey-based market simulation model to calculate price premium damages must obtain robust estimates of but-for world demand. However, these demand estimates cannot be used on their own to calculate price premium damages.
11. *See*, e.g., Moshe Ben-Akiva, Daniel McFadden, and Kenneth Train (2019), "Foundations of Stated Preference Elicitation: Consumer Behavior and Choice-based Conjoint Analysis", Foundations and Trends in Econometrics: Vol. 10, Nos 1–2, Chapter 2. *See also* Allenby, G.M., Brazell, J.D., Howell, J.R. et al. "Economic valuation of product features". Quant Mark Econ 12, 421–456 (2014). https://doi.org/10.1007/s11129-014-9150-x and Daniel McFadden (2022) "Instability in Mixed Logit Demand Models", Journal of Choice Modelling: Vol.43, pp. 2–15, Section 6.
12. Note that this chapter is concerned only with the measurement of damages assuming that the producer is found liable for differences between the actual attributes of a product and buyers' expectations regarding these attributes. It does not address the questions of whether such differences actually occurred, and if they did occur, the extent to which the producer is legally liable for them.
13. For a key decision that emphasised the need for market simulations to adequately account for supply, *see*, e.g., GM1. *See also* In Re: Volkswagen "Clean Diesel" Marketing, Sales Practices, And Products Liability Litigation, Order Excluding Evidence And Dismissing Case For Lack Of Jurisdiction (Northern District of California, Nov 12, 2020).
14. *See* My Ford Touch Consumer Litig., 291 F. Supp. 3d 936, 970 (N.D. Cal. 2018) at 971.
15. There have been a number of decisions in product mislabelling cases where courts have rejected analysis of CBC survey data on its own (often referred to as conjoint analysis) as a means of measuring price premium damages. *See*, e.g., Zakaria v. Gerber Decertification Decision at *54–55. *See* also In re NJOY at *17–21. However, other decisions have incorrectly found that conjoint analyses can adequately account for supply-side factors "when (1) the prices used in the surveys underlying the analyses reflect the actual market prices that prevailed during the class period; and (2) the quantities used (or assumed) in the statistical calculations reflect the actual quantities sold during the class period". *See*, e.g., Hadley v. Kellogg Sales Co., 324 F. Supp. 3d 1084 (U.S. Dist. 2018) at *43. As discussed in detail in

this chapter, the inclusion of actual market prices in the CBC survey does not somehow transform an analysis that can (at best) measure demand into one that can also capture supply (i.e., the behaviour of willing sellers). Moreover, as explained at length in Section III, a calculation that assumes without any economic evidence or support that supply is fixed at actual quantities is unreliable because it would not reflect the behaviour of willing buyers and willing sellers.

16. As noted in the chapter, economically sound market simulation models can be used to simulate both the actual world and the but-for world. Hence, we distinguish observed actual-world prices and quantities from simulated actual-world prices and quantities.
17. *See*, e.g., Moshe Ben-Akiva, Daniel McFadden and Kenneth Train (2019), "Foundations of Stated Preference Elicitation: Consumer Behavior and Choice-based Conjoint Analysis", Foundations and Trends in Econometrics: Vol. 10, Nos 1–2, Chapter 2. *See also* Allenby, G.M., Brazell, J.D., Howell, J.R. et al. "Economic valuation of product features". Quant Mark Econ 12, 421–456 (2014). https://doi.org/10.1007/s11129-014-9150-x.
18. Section IIB highlights some necessary elements of an economically sound survey-based market simulation. The full set of modelling elements that would be sufficient for an economically sound survey-based market simulation will depend on the specific characteristics of the product and market at issue. Further, it is important to recognise that computing market equilibria is a challenging technical undertaking – *see*, e.g., Daniel McFadden (2022) "Instability in Mixed Logit Demand Models", Journal of Choice Modelling: Vol.43, pp. 2–15, Section 6.
19. Although this chapter does not focus on the difficulties associated with designing and implementing a CBC survey that will provide reliable estimates of consumer demand, these difficulties are one key reason why the courts have viewed survey-based market simulation analyses sceptically when damages can be computed using observed actual-world data. As explained in Section III of this chapter, another key reason is the issues that can arise in constructing and solving the market simulation model.
20. In this simple, illustrative example, we assume that there are no actual-world observed market data available before and after disclosure of the misrepresentation. As discussed above, when such suitable data are available they can be used to implement one or more of the statistical methods mentioned above – i.e. "difference-in-difference", "hedonic regression", or "synthetic control" analysis. Such analyses of actual-world data normally provide the best direct evidence on price premium damages (if any).
21. Recall that we have assumed (for illustrative purposes) that there are no actual-world observed market data available before and after disclosure of the misrepresentation. Hence, we have deliberately constructed an example in which it is not possible to perform a statistical analysis of actual-world data to assess the market price premium (if any).
22. To see why an analysis of demand for the at-issue product must take into account the relevant competing products, consider the case of substitute products. If a similar product to the at-issue product is introduced into the market, we would expect – all else being equal – that demand for the at-issue product will decline as some consumers shift their purchases to a new product. Thus, to determine demand for the at-issue product, it is necessary to consider substitute products.
23. The choice of attributes is a critical aspect of the analysis and is often based on focus group research and/or attributes identified in publications like Consumer Reports that rank products based on their attribute levels.
24. *See*, e.g., Bryan K. Orme, "Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing Research", 4th Edition, Research Publishers LLC (2020), Chapter 1.
25. *See*, e.g., Bryan K. Orme, and Keith Chrzan, "Becoming an Expert in Conjoint Analysis: Choice Modelling for Pros", Sawtooth Software, 2017, Chapter 5.4. The "no-buy" option can be included in the survey either directly in the menu of choices, or as a follow-up question once the respondent has made his product choice. The latter two-stage design, called the "Dual-Response None" design, has become more common and is the survey design we use in Figure 1.
26. A necessary but not sufficient condition for Plaintiffs seeking to estimate product **demand** using conjoint survey data alone, is that the conjoint survey must include a no-buy option. *See*, e.g., Moshe Ben-Akiva, Daniel McFadden and Kenneth Train (2019), "Foundations of Stated Preference Elicitation: Consumer Behavior and Choice-based Conjoint Analysis", Foundations and Trends in Econometrics: Vol. 10, Nos 1–2, Chapter 2, Section 2.1.3. *See also* Allenby, G.M., Brazell, J.D., Howell, J.R. et al. "Economic valuation of product features". Quant Mark Econ 12, 421–456 (2014). https://doi.org/10.1007/s11129-014-9150-x. It is also critical that – under the set-up of the Plaintiffs' expert's CBC survey – respondents treat each choice task as if it were their **only** opportunity to participate in this market during a specified period. Moreover, even if the Plaintiffs' expert meets these and other requirements for the design and execution of the conjoint survey, it is generally impossible to determine price premium damages without incorporating the information from these survey-based demand estimates into an economically sound market simulation model.
27. In the simple example in Figure 1, we can infer that a consumer who chose Choice 3 would be willing to pay at least $10 for jeans Made in USA. This is because the only difference between Choice 1 and Choice 3 is whether the jeans were Made in USA; the consumer who picks Choice 3 indicates that she is willing to pay at least $10 extra for a Made in USA version of the jeans.
28. Note that the target population must be composed of current and prospective buyers of the product. Non-buyers must not be excluded from a survey that is intended to obtain valid demand estimates.
29. It is important that the product profiles presented in each choice task are realistic and understandable to respondents. It is also important that variation in each choice task's product profile is sufficient to reliably estimate consumer preferences for the various product attributes.
30. In each world, the firm's demand curve represents the relationship between its product's own price and the amount of this product desired by buyers. For example, Firm Axe's but-for world demand curve for product *A* represents the relationship between product *A*'s but-for world price and the total units of product *A* desired by buyers under but-for world conditions. Likewise, Firm Blaze's but-for world demand curve for product *B* represents the relationship between product *B*'s but-for world price and the total units of product *B* desired by buyers under but-for world conditions.
31. The reason for this is discussed in endnote 22.
32. Note that a parameter on an attribute level like an inferior brand can be expected to make a negative contribution to the respondent's valuation of the product.
33. *See*, e.g., Bryan K. Orme, "Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing

Research", 4th Edition, Research Publishers LLC (2020), Chapters 1 and 2. In the chapter, we discuss how these part-worths have sometimes been misused in determining damages.

34. Some of these issues are addressed above, including in endnotes 23, 26, 28, and 29. For a further discussion of these and other issues associated with the design and implementation of CBC surveys, *see*, e.g., Moshe Ben-Akiva, Daniel McFadden, and Kenneth Train (2019), "Foundations of Stated Preference Elicitation: Consumer Behavior and Choice-based Conjoint Analysis", Foundations and Trends in Econometrics: Vol. 10, Nos 1–2, Chapter 2.
35. Although this chapter focuses on survey-based market simulations, the economic fundamentals described in this section apply to market simulations more generally.
36. As noted above, this discussion assumes that the survey expert's CBC demand analysis has been conducted in accordance with relevant scientific and technical standards, which is an extremely challenging exercise under the best of circumstances.
37. Note that we present a textbook demand and supply curve framework to provide intuition on how a market simulation model determines equilibrium prices and quantities. When buyers or sellers face more complex decisions than those present in this textbook setting, such as active competition among rival sellers, their interactions can be difficult to represent in a simple graphical form. In that case, the market simulation model combines the demand curves estimated using conjoint analysis with supply-side information on costs and competitor interactions in order to produce but-for world market equilibrium prices and quantities. However, the principles that influence the behaviours of willing buyers and willing sellers will still apply, and their interaction will lead to a market equilibrium.
38. Note that the terms "market price", "market equilibrium price", and "equilibrium price" are synonymous from an economic perspective and can be used interchangeably.
39. This assumption is made for illustrative purposes in our simple example. However, whether or not the demand curve actually shifts in response to a disclosure is an empirical question that would need to be tested using data.
40. This assumption is made so that we can focus on the impact of a hypothesised downward shift in demand due to the removal of a desirable product feature. Note that we have also assumed that the supply curve is upward sloping but does not move in response to the disclosure of the misrepresented feature. Because demand falls, price also falls from P_B^{actual} to $P_B^{but\text{-}for}$. This is not the same as assuming that the quantity supplied is fixed to the quantity sold in the actual world. We discuss the latter economically unsound but-for construct in further detail in the chapter.
41. As noted previously, in our simple illustrative example, the supply curve is upward sloping but does not shift in response to the hypothetical information disclosure. Hence, the supply curve in the actual world is the same as the supply curve in the but-for world. More generally, however, there may be conditions in which both demand and supply shift in the but-for world. For example, if the marginal cost of the firm in the but-for world changes relative to the actual world, the supply curve would shift as well. In that case, but-for world market prices are determined by the intersection of the but-for world demand curve and the new but-for world supply curve.
42. For example, Church and Ware state that, "[a]t the equilibrium price both firms and consumers are able to fulfill their planned or desired trades: firms are able to sell their profit-maximizing quantities and consumers are able to purchase their utility-maximizing quantities". *See* Jeffrey Church and Roger Ware, "Industrial Organization: A Strategic Approach", McGraw-Hill/Irwin, 2000, at p. 23.
43. The reliability of such market simulations is improved by collecting cost data that can validate the assumption that firms are profit-maximising and accounting for the effect on costs of changes in product attributes. Moreover, the simulated market must itself be realistic, containing all the actual-world products that are close substitutes for the at-issue product, as well as an outside option. Including all of these actual-world products in the CBC survey could allow one to test whether the market simulation correctly predicts each actual-world product's equilibrium price and quantity.
44. To see, intuitively, why market prices must reflect both demand-side and supply-side factors (including both production costs and the nature of competition), consider the case of a computer laptop screen. Assume we conducted a conjoint analysis in which we assessed consumers' valuations for monochrome versus colour monitors. If we computed your valuation for colour over monochrome, we would likely find that the incremental value of colour over monochrome is worth a thousand dollars or more. Due to competition, however, laptops with colour monitors are readily available on the market at relatively inexpensive prices. This is a key reason why demand-side-only valuations that fail to take into account competition and supply often overstate market prices. *See*, e.g. Bryan K. Orme, "Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing Research", 4th Edition, Research Publishers LLC (2020), Chapter 9.
45. Figure 2 provides a conceptual illustration of how the removal of the alleged misrepresentation impacts product *B*'s price and quantity in the but-for world. However, it is important to recall that, in an economically sound market simulation, competing firms simultaneously choose the but-for prices of their own products. In particular, each competing firm's goal is to choose a price for its product that will maximise its profits, given its own production costs, the prices of its competitors' products, and consumer demand for its products. The prices produced by this simultaneous profit maximisation analysis are the market equilibrium prices.
46. In our jeans example, the model will generate a but-for world market equilibrium price and quantity for both product *A* and product *B*. It is worth noting here that the but-for world demand curve for product *A* depends on: (i) the parameters of the but-for world demand curve for product *A*; (ii) but-for world attribute levels of product *A*; and (iii) but-for world attribute levels and price of product *B*. Similarly, the but-for world demand curve for product *B* depends on: (i) the parameters of the but-for world demand curve for product *B*; (ii) but-for world attribute levels of product *B*; and (iii) the but-for world attribute levels and price of product *A*.
47. Although the above example involves a product misrepresentation case, the same economic analysis would apply in a product defect case. For example, consider a case in which Plaintiffs claim that a manufacturer of machinery did not disclose an alleged defect in its product. If Plaintiffs sought to use a market simulation model to calculate price premium damages in that case, those damages (if any) would still be calculated as the difference between actual-world and but-for world market equilibrium prices (where the alleged defect would be undisclosed in the actual world but disclosed in the but-for world). But-for world prices would

be determined by the interaction of supply and demand in the but-for world and actual-world prices would be determined by the interaction of supply and demand in the actual world. Disclosure could potentially reduce demand for the at-issue product in the but-for world, relative to the actual world. If the disclosure did reduce demand for the at-issue product, this could lead to a change in market equilibrium prices and quantities for both the at-issue product, as well as for competing products.

48. As previously noted, recent court decisions have emphasised the need for survey-based market simulations to adequately take into account supply. *See*, e.g., GM1. *See also* In Re: Volkswagen "Clean Diesel" Marketing, Sales Practices, And Products Liability Litigation, Order Excluding Evidence And Dismissing Case For Lack Of Jurisdiction (Northern District of California, Nov 12, 2020).
49. Recall that, when we use conjoint analysis to estimate the parameters of the demand curve, those parameters are referred to as part-worths. These part-worths are measured on the utility scale. Like the temperature scale, the utility scale is an arbitrary scale. The utility scale allows each individual to rank different product attribute levels as well as products.
50. For example, if the part-worth associated with the price is -0.5 and the part-worth associated with Made in USA is given by 5, then consumers' WTP for the Made in USA attribute is $10 (5/0.5).
51. More generally, one can calculate the WTP for any given (non-price) attribute level by dividing (i) the part-worth of that attribute level by (ii) the negative of the part-worth of price. One can then calculate the WTP for the product as the sum of the WTPs for each of the product's attribute levels.
52. It is important to recognise that each consumer will have his/her own WTP. Hence, the expert who purports to measure price premium damages based on WTP alone will need to advance a single measure of WTP. In some prior cases, the single measure of WTP chosen has been the average WTP for the misrepresented feature. However, this measure is inappropriate because there is no straightforward relationship between this figure and price premium damages. In other cases, Plaintiffs' experts have asserted that they are measuring damages based on the WTP of the marginal consumer (*see*, e.g., In re Dial Complete Mktg. & Sales Practices Litig., 320 F.R.D. 326, 332 (D.N.H. 2017), where the marginal consumer is the consumer who has the lowest WTP above the current market price among all potential consumers. However, with heterogeneous consumers, it is impossible to determine the marginal consumer in the but-for world without information on the supply side. *See* McFadden, D. L., and Train, K. E., "Welfare Economics in Product Markets", Working Paper, February 21, 2019, https://eml.berkeley.edu/~train/prodmarkets.pdf.
53. *See supra*, endnote 42.
54. *See* McFadden, D.L., and Train, K.E., "Welfare Economics in Product Markets", Working Paper, February 21, 2019, https://eml.berkeley.edu/~train/prodmarkets.pdf. *See also* Allenby, G.M., Brazell, J.D., Howell, J.R. et al. "Economic valuation of product features". Quant Mark Econ 12, 421–456 (2014). https://doi.org/10.1007/s11129-014-9150-x.
55. It is worth noting that in many of these cases, Plaintiffs' experts have relied on statistical software provided by Sawtooth Software to purportedly perform survey-based "market simulations". However, this software is not built to perform an economically sound market simulation, in which competitors are allowed to respond to changes in product attributes by changing their prices and quantity sold, and in which market equilibrium prices are determined. *See*, e.g., Bryan K. Orme, "Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing Research", 4th Edition, Research Publishers LLC (2020), Chapter 10, and Bryan K. Orme and Keith Chrzan, "Becoming an Expert in Conjoint Analysis: Choice Modelling for Pros", Sawtooth Software, 2017, Chapters 14 and 15. *See also* https://sawtoothsoftware.com/help/lighthouse-studio/manual/index.html?simulator.html.
56. *See* Zakaria v. Gerber Decertification Decision at *54–55.
57. *See* Toby Schechner, et al. v. Whirlpool Corporation, No. 16-12409, 2019 U.S. Dist. LEXIS 171642, at *19–20 (E.D. Mich. Aug 13, 2019).
58. *See* In re NJOY at *17–21. GM says this too for product defect cases. *See* GM1 at *236–238 and GM2 at 19–20.
59. *See*, e.g., GM1 at *189.
60. For example, numerous Plaintiffs' experts have deployed this unsound but-for world construct in motor vehicle product liability cases, such as the GM Ignition matter among others. However, the assumption of fixed supply is inconsistent with how this industry works. In reality, motor vehicle companies manufacture vehicles in response to changes in demand. *See*, e.g., General Motors Company, Form 10-K for the Fiscal Year Ended December 31, 2020, at p. 3: "The market for vehicles is cyclical and depends in part on general economic conditions, credit availability and consumer spending. Vehicle markets are also seasonal. Production varies from month to month. Vehicle model changeovers occur throughout the year as a result of new market entries." Thus, the assumption of fixed supply at historical levels is inconsistent with the actual operation of the market for vehicles.
61. It is difficult to imagine circumstances in which fixing supply in this way would be consistent with the actions of willing sellers because real-world examples of industries with fixed supply are practically non-existent. However, even if Plaintiffs could make a plausible case that supply is fixed at the level of quantity provided in the actual-world market, it is logically incorrect to predict the but-for price by requiring that this price be set so that actual-world buyers have the same propensity to buy in the but-for world as they did in the actual world. As long as consumers have heterogeneous preferences, then the new marginal consumers under but-for conditions may come from the population of consumers who are relatively indifferent to the feature change. These consumers, who may have been deterred from purchasing the product under actual-world conditions due to the relatively high actual-world price, may be inclined to buy at a lower but-for price. Thus, there is no stable relationship between stated WTP of conjoint respondents and a price premium coming out of market equilibrium, regardless of whether or not supply is fixed.
62. Referring back to Figure 2, the resulting market price premium is captured by the vertical distance between points *X* and *Y*.
63. In contrast, under the economically sound but-for world depicted in Figure 2, Q_{actual} exceeds $Q_{but\text{-}for}$. This is because the at-issue supplier is willing to sell less product at the lower prices associated with disclosure in this hypothetical example.
64. GM1 at *235.
65. GM1 at *235.

Dr. Lisa Cameron is a Principal and Practice Leader of the Consumer Protection & Product Liability practice at The Brattle Group. She is an economist with 25 years of experience consulting to attorneys involved in commercial litigation and other complex matters.
In her work on false advertising matters, Dr. Cameron has provided economic analyses in a number of high-profile consumer class actions. Her work in these cases includes performing economic evaluations of conjoint surveys used to estimate but-for world demand and survey-based market simulation models used to determine market price premium damages. She has also been involved in a number of Lanham Act matters in which she has addressed liability issues with likelihood-of-confusion experiments and has analysed actual-world data and/or reviewed survey-based market simulations used to estimate damages.
Dr. Cameron has previously published several papers on the appropriate use of survey-based market simulations in both product misrepresentation and intellectual property cases. Prior to becoming a consultant, she was a professor of economics at Carnegie Mellon University's Tepper School of Business. She received her Ph.D. in Economics from Stanford University and her B.Sc. in Applied Economics from Cornell University.

The Brattle Group
One Beacon Street, Suite 2600
Boston, MA 02108
USA

Tel: +1 617 864 5746
Email: lisa.cameron@brattle.com
URL: www.brattle.com

Daniel McFadden is the E. Morris Cox Professor Emeritus of Economics at the University of California at Berkeley and the Presidential Professor of Health Economics and Policy Emeritus at the University of Southern California. He is also a Principal at The Brattle Group and received his Ph.D. in Economics from the University of Minnesota. In 2000, Professor McFadden was awarded the Nobel Memorial Prize in Economics for his work on discrete choice modelling.
The discrete choice models that Professor McFadden pioneered are used extensively by economists and statisticians to explain or predict a choice among two or more discrete (i.e., distinct and mutually exclusive) alternatives, including in the context of product liability litigations. Professor McFadden has served as an expert in several product liability actions in which he testified on economically sound methods for calculating market prices given discrete choice demand. Throughout his career, he has published more than 100 peer-reviewed articles and has written or edited several academic books and monographs on economic modelling. Many of these publications have focused on the design and analysis of stated preference surveys.

The Brattle Group
415 Mission Street, Suite 5010
San Francisco, CA 94105
USA

Tel: +1 617 864 5746
Email: lisa.cameron@brattle.com
URL: www.brattle.com

Dr. Pablo Robles is a Senior Associate in the Chicago office of The Brattle Group. He is an economist with significant experience performing complex economic analyses and calculating damages. In his casework, he develops and analyses statistical and econometric models to calculate damages in product liability, false advertising, antitrust, and market manipulation cases. He has analysed a broad set of industries in his casework, including motor vehicles, consumer product goods, commodities, mortgages, and pension funds. He has served as an expert in a tariff classification case with the United States Court of International Trade.
Dr. Robles received his Ph.D. in Economics from the University of Chicago, where he focused his research on analysing the competitive effects of trade policy using structural econometric methods. As a graduate student, he taught an undergraduate course in advanced macroeconomics. Prior to graduate school, Dr. Robles worked as a research assistant to the chief economist at the Mexican Ministry of Finance. At the Ministry, he conducted research on numerous topics, including banking, education, financial markets, fiscal sustainability, and poverty.

The Brattle Group
181 West Madison Street, Suite 3400
Chicago, IL 60602
USA

Tel: +1 872 302 6125
Email: pablo.robles@brattle.com
URL: www.brattle.com

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