THE BUT-FOR MARKET, ECONOMIC DAMAGES, AND ELASTICITY CONSIDERATIONS

By: James F. Nieberding[1]

1. Introduction

One purpose in awarding economic damages is to make a plaintiff "whole" by returning them to the same economic position they would have been in absent some challenged conduct.[2] A key concept inherent in such damages assessments is that of the "but-for market." Because damages often are measured by evaluating a plaintiff's economic position but-for the challenged conduct relative to that which actually occurs, it may be necessary to investigate the extent to which prices, output, and costs differ between these two "states of the world." If these metrics need to be reconstructed in a damages model, the shape of the demand curve can play an important role.[3] This article illustrates the implications of the shape of the demand curve for damages estimates when but-for prices or but-for volumes differ from those observed in the actual market.

2. Lost Profits

Lost profits damages in antitrust and patent infringement cases often are estimated as the difference in a plaintiff's profits between the but-for and actual market during the damages period. In contemplating such damages, attention must be paid to the shape of the demand curve particularly when but-for prices or volumes differ from those in the actual market. The economic tenet known as "the law of demand," which holds that price and quantity demanded (or volume sold) are inversely related except in very special circumstances, is a principle recognized by practitioners in estimating lost profits.[4] For example, in patent matters, price erosion damages arise when prices in the but-for market (absent infringement) would have been higher than those in the actual market. A higher but-for price,

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[2] This approach is recognized as the proper way to estimate economic damages. *See, e.g.*, Reference Manual on Scientific Evidence: Reference Guide on Estimation of Economic Losses in Damages Awards (Federal Judicial Center, 2d ed. 2000).

[3] The shape of the demand curve can be summarized by the elasticity of demand (which is a function of the "first derivative") and the curvature (the "second derivative"). The responsiveness of quantity demanded (or volume sold) to a change in price is known as the price elasticity of demand – for a given percentage change in price, how much will the amount purchased/sold change. For example, a price elasticity of -0.6 indicates that a 10 percent decrease in price would increase the quantity demanded by 6 percent, all else constant. Conversely, this means that in order for the marketplace to absorb 6% more quantity, price would need to fall by 10%, all else constant.

[4] *See, e.g.,* Brett A. Margolin *Lost Profit Damages: Beware the Demand Curve's Slippery Slope,* 2 ABA SECTION OF INTELLECTUAL PROPERTY LAW (2003).

however, implies a reduction in the but-for quantity demanded when demand is "downward-sloping." As a result, the higher but-for price means that the patentee's lost unit sales will be less than those garnered by the infringer.[5] How much less depends on the shape of the demand curve, as Table 1 illustrates.

In this example, the plaintiff's actual profit is $8,000 under the challenged conduct given its price, cost, and unit sales (Panel A). If it is argued that the plaintiff's price in the but-for market would have been $70/unit (and not $60/unit), damages would be calculated at $4,000 (*i.e.*, a $10 price differential on 400 units sold, as in Panel C) if the economic principle that a higher but-for price implies a lower but-for quantity is ignored. This damages calculation assumes that the but-for volume is

Table 1: Price-Erosion Example (Higher But-For Price)

Panel A		Panel B		Panel C	
ACTUAL MARKET		BUT-FOR MARKET		BUT-FOR MARKET (Not Considering Elasticity)	
Unit Price	$60	Estimated Unit Price	$70	Estimated Unit Price	$70
Unit Cost	$40	Unit Cost	$40	Unit Cost	$40
Unit Sales	400	Calculated Unit Sales	300	Actual Unit Sales	400
Profit	**$8,000**	**Profit**	**$9,000**	**Profit**	**$12,000**
		Demand Elasticity:	-1.5	Demand Elasticity:	0
		Calculated Damages:	$1,000	Calculated Damages:	$4,000

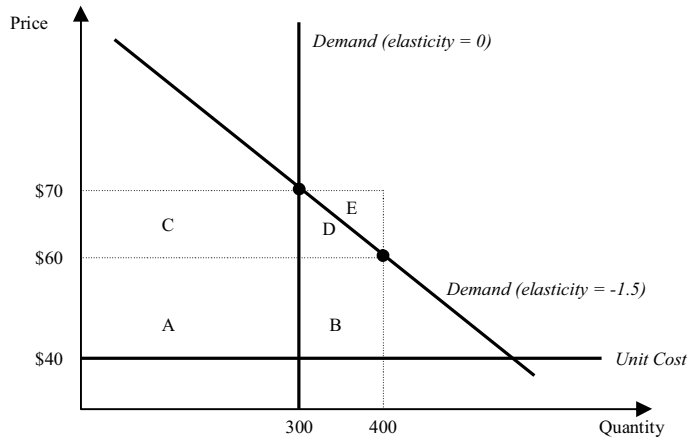
identical to that in the actual market (*i.e.*, 400 units). However, if the demand curve were linear with price elasticity of demand of -1.5 at the actual price, then the 16.67% higher but-for price (*i.e.*, $70 v. $60) requires that the but-for quantity be 25% lower than in the actual market (or 300, as in Panel B). Incorporating this fact into the damages analysis results in lost profits of $1,000 (*i.e.*, $9,000 minus $8,000), $3,000 lower than the damages calculation which ignores the elasticity issue (Panel C).

This principle can be seen graphically in Figure 1. Area A+C represents the patentee's but-for profit, area A+B represents actual profits, and their difference (*i.e.*, area C less area B, or $1,000) is economic damage that reflects the price-

[5] *See, e.g.*, Gregory J. Werden, L. Beavers, & L. Froeb, *Quantity Accretion: Mirror Image of Price Erosion from Patent Infringement*, 81 J. OF PATENT & TRADEMARK SOCIETY 479 (1999); James F. Nieberding, *Lost Profits and Price Erosion in Patent Infringement Cases: Implications of Crystal Semiconductor,* 16(1) J. OF FORENSIC ECON. 37 (2004); and Roy Epstein, *The Market Share Rule with Price Erosion: Patent Infringement Lost Profits Damages after Crystal,* 31(1) AIPLA Q.J. 1 (2003).

elasticity effect (as in Panel B).[6] This amount is less than that which assumes a perfectly inelastic demand curve, where the difference in but-for and actual profits is area C+D+E, or $4,000 (Panel C). If demand is perfectly inelastic (*i.e.*, the price elasticity is zero), this in effect assumes that the patentee can raise price without losing any unit sales. Courts have viewed price erosion damages that do not

Figure 1: Price Erosion Example
(Higher But-For Price)



account for demand elasticity as less than credible.[7] Moreover, this principle applies to circumstances outside of price erosion damages. For instance, Simpson and Wickelgren (2007), in their analysis of contract exclusivity and entry deterrence, state:

> While estimating the 'but-for' quantity is more difficult than using the actual quantity…courts are increasingly calculating damages based on an estimate of the 'but-for' quantity rather than calculating damages based on the actual quantity purchased at the lower market price. For this reason, we assume in our model that courts follow the intent of expectation damages and use an estimate of the 'but-for' quantity to calculate expectation damages. Having said this, there are cases in which courts overestimate damages by using the actual

[6] This damage amount is equivalent to the difference in the patentee's producer surplus in the but-for and actual markets.

[7] "Moreover, in a credible economic analysis, the patentee cannot show entitlement to a higher price divorced from the effect of that higher price on demand for the product. In other words, the patentee must also present evidence of the (presumably reduced) amount of product the patentee would have sold at the higher price. … All markets must respect the law of demand. … Markets typically have an elasticity greater than zero and less than infinity." *Crystal Semiconductor Corp. v. TriTech Microelectronics Int'l Inc.*, No. 99-1558 (Fed. Cir. Mar. 7, 2001).

quantity purchased at the lower market price to approximate what the defendant would have purchased at the higher market price.[8]

Conversely, in certain instances where plaintiffs allege higher but-for unit sales (*e.g.*, a breach of contract where the defendant has undersupplied the plaintiff), the implication is that there will be a lower but-for price. How much lower again depends on the shape of the demand curve for the product sold by the plaintiff. Accounting for this will result in a reduction in economic damages vis-à-vis an analysis that does not consider this. For instance, in the example in Table 2, assume that plaintiff's actual profit is $21,000 given its price, cost, and unit sales in the presence of the challenged conduct (Panel A). If it is argued in the but-for market that plaintiff's unit sales would have been 400 and not 300, then by ignoring the economic principle that a higher but-for quantity implies a lower but-for price, economic damages would be overestimated by $4,444 (*i.e.*, $7,000 minus $2,556) assuming a linear demand curve and a price elasticity of -3.0 at the actual price. That is, the one-third higher quantity in the but-for market (*i.e.*, 400 v. 300) requires that the but-for unit price be approximately 11.1% lower (*i.e.*, $88.89 v. $100 as in Panel B). This phenomenon is ignored in the damages calculation in Panel C, where it is assumed that the plaintiff can sell approximately 33% more units in the but-for market without having to lower price.

This principle can be seen in Figure 2. Area B+C represent the plaintiff's profit in the but-for market, area A+B represent actual profits, and their difference (*i.e.*, area C less area A, or $2,556) is economic damage that incorporates the price elasticity effect (as in Panel B).[9] This amount is less than that which ignores the price elasticity effect, where the difference in but-for and actual profits is area C+D+E, or $7,000 (as in Panel C). The analysis in Panel C assumes that the demand curve facing the plaintiff is "fixed" (or perfectly elastic) at a price of $100, and is insensitive to additional unit sales. The extreme assumption of perfectly elastic demand is difficult to justify absent convincing economic evidence to suggest otherwise.

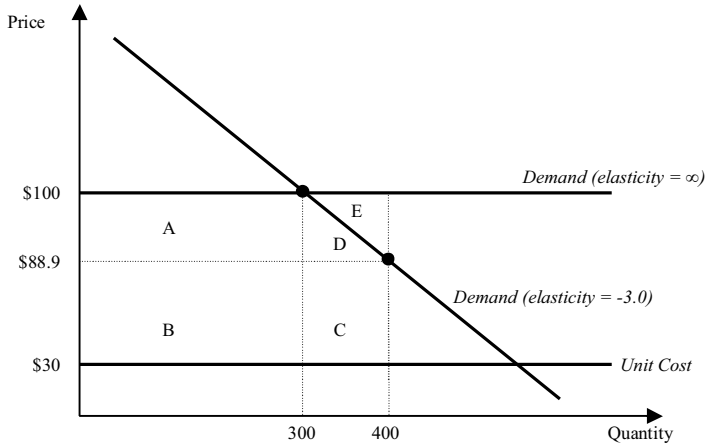
[8] John Simpson & Abraham L. Wickelgren, *Naked Exclusion, Efficient Breach, and Downstream Competition*, 97(4) AM. ECON. REV. 1305, 1308-09 (Sept. 2007).

[9] This damage amount is equivalent to the difference in the plaintiff's producer surplus in the but-for and actual markets.

Table 2: Breach-of-Contract Example (Higher But-For Quantity)

Panel A		PANEL B		PANEL C	
ACTUAL MARKET		BUT-FOR MARKET (Elasticity = -3.0)		BUT-FOR MARKET (Not Considering Elasticity)	
Unit Price	$100	Calculated Unit Price	$88.89	Actual Unit Price	$100
Unit Cost	$30	Unit Cost	$30	Unit Cost	$30
Unit Sales	300	Estimated Unit Sales	400	Estimated Unit Sales	400
Profit	**$21,000**	**Profit**	**$23,556**	**Profit**	**$28,000**
		Demand Elasticity:	-3.0	Demand Elasticity:	infinity
		Calculated Damages:	$2,556	Calculated Damages:	$7,000

Figure 2: Breach-of-Contract Example (Higher But-For Quantity)



3. Damages in Price-Fixing Litigation

Plaintiffs as Direct Purchasers

In calculating damages in price-fixing cases under United States law, damages are based upon an overcharge – the difference between actual and but-for prices – multiplied by the quantity purchased during the damages period (the "standard approach"). By way of example, in Table 3, the direct-purchaser plaintiffs are assumed to be final consumers of the price-fixed item (*e.g.*, grocery store customers subject to a price-fixing conspiracy by stores involving loaves of bread). Assume plaintiffs buy 100,000 loaves for $2.50 each during the anticompetitive period, spending $250,000 (Panel A). If the but-for price is $2.25, the standard approach yields an overcharge of $25,000. As noted by Brander and Ross (2006), however, while the standard approach to calculating damages in price-fixing cases

is to multiply the overcharge by actual purchases, "[s]trictly speaking, both the price and quantity should be estimated."[10] While the example in Table 3 is, in effect, the reverse scenario to that of the price erosion example (Table 1), the economic principle is the same. That is, accounting to the law of demand, a lower but-for

Table 3: Price-Fixing Example
(Direct Purchasers Are Final Consumers)

Panel A		Panel B		Panel C	
ACTUAL MARKET		BUT-FOR MARKET (Elasticity = 0)		BUT-FOR MARKET (Elasticity = -0.5)	
Unit Price Paid	$2.50	Estimated Unit Price	$2.25	Estimated Unit Price	$2.25
Units Bought	100,000	Units Bought	100,000	Calculated Unit Sales	105,000
Total Paid	**$250,000**	**Total Paid**	**$225,000**	**Total Paid**	**$236,250**
Cons. Surplus	**$250,000**	**Cons. Surplus**	**$275,000**	**Cons. Surplus**	**$275,625**
		Demand Elasticity:	0.0	Demand Elasticity:	-0.5
		Change in Total Paid:	$25,000	Change in Total Paid:	$13,750
		Change in Cons. Surplus:	$25,000	Change in Cons. Surplus:	$25,625

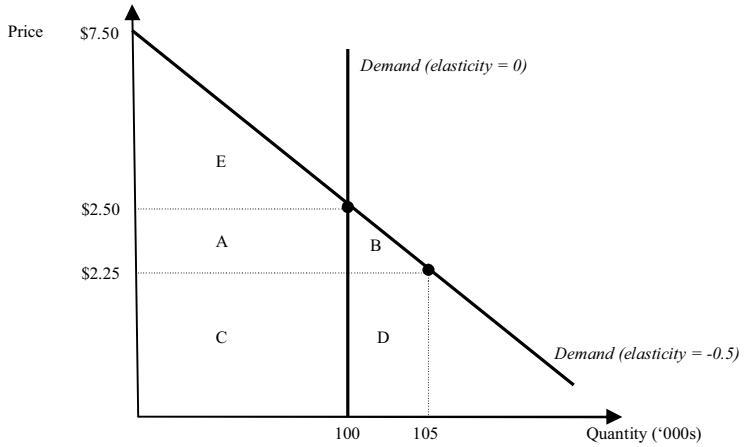
price implies a higher but-for quantity relative to the actual market (all else equal). However, unlike economic damages based upon lost profits which may be reduced as a result of a higher but-for quantity (such as the example in Table 2), economic damages will increase with a higher but-for quantity (due to a lower but-for price) when consumer surplus is the basis for economic harm (*e.g.*, Brander and Ross (2006); Basso and Ross (2008)). The exception is when demand is perfectly inelastic.

This can be seen in the example in Table 3 (Panel B). Under the standard approach which is tantamount to assuming perfectly inelastic demand, overcharge damages are equivalent to the change in total plaintiff expenditures as well as to the change in consumer surplus between the actual and but-for market (*i.e.*, $25,000). As seen in Figure 3, in the actual market, consumer surplus is represented by area E. In the but-for market, it is area E+A, with the difference being area A, or $25,000 as in Panel B. In Panel C, with a downward-sloping demand curve, the 10% lower but-for price (*i.e.*, $2.25 v. $2.50) implies that the but-for quantity will be 5% higher (*i.e.*, 105,000 v. 100,000) assuming a linear demand curve with elasticity of -0.5 at the actual price. While total consumer expenditures would be $13,750 in the but-for market (*i.e.*, area A+C minus area C+D), economic damages, based upon the difference in consumer surplus between the actual and but-for market, will be higher than the $25,000 under the

[10] James A Brander & Thomas W. Ross, *Estimating Damages From Price-Fixing*, 3(1) CANADIAN CLASS ACTION REV. 335, 337-38 (2006).

standard approach.[11] This is so because, as seen in Figure 3, the difference in consumer surplus in the but-for versus actual market is area A+B, which now includes the additional harm known as deadweight loss associated with the artificially elevated price during the damages period (*i.e.*, area B, or $625).[12]

Figure 3: Price-Fixing Example
(Direct Purchasers Are Final Consumers)



The but-for quantity (together with the demand curve) is needed if one wishes to estimate the deadweight loss associated with price fixing (*i.e.*, area B in this example). While this is a realistic consideration as a matter of economics, calculating it entails more information than does the standard approach which does not require an estimate of the demand curve. Moreover, as others have pointed out, since the transactions affected by the deadweight loss are not "present" in the actual market, only in the but-for market, U.S. law ignores them in damages calculations for price-fixing cases.[13] As a result, the standard approach is taken in price-fixing matters involving direct purchasers as final consumers, though the

[11] The appropriate measure of damages to consumers is the difference in consumer surplus in the but-for and actual markets, not the difference in their expenditures.

[12] *See, e.g.,* Brander & Ross, *supra* note 10, and Leonardo Basso & Thomas W. Ross, MEASURING THE TRUE HARM FROM PRICE-FIXING ON BOTH DIRECT AND INDIRECT PURCHASERS (Phelps Centre for the Study of Gov't & Business, Univ. of British Columbia, Working Paper No. Phelps-WP-2007-01, Apr. 2007, rev. Jan. 23, 2008). Deadweight loss arises as a result of the higher price during the anticompetitive period as some buyers switch from the now relatively more expensive item to substitutes which presumably were less desirable prior to the price increase. This constitutes a welfare loss for buyers.

[13] *See, e.g.,* Brander & Ross, *supra* note 10, at 339-40, who also note that the deadweight loss component usually is ignored in practice because, under certain assumptions, it may be small relative to those computed under the standard approach.

difference in consumer surplus between the actual and but-for market is recognized as the "true" economic harm.[14]

Plaintiffs as Indirect Purchasers

If the final customer of the price-fixed item is an indirect purchaser, then issues of pass-through ("PT") come in to play assuming the legal framework allows for such consideration. This addresses to what extent a direct purchaser of a price-fixed item passes on an overcharge to its customers who, in turn, sell to their customers, and so on, down the distribution chain until the indirect purchasers at issue are reached. Because issues of PT must be analyzed at each level of distribution, an added complexity is that at each level there might a different market structure with different implications for PT, as well as various manifestations of PT.[15]

At its simplest, assume that a direct purchaser merely resells to indirect purchasers its purchases of a price-fixed item on a one-to-one basis, with no costs other than that of the price-fixed item. For example, assume that the defendant is an upstream baking firm who sells loaves of bread directly to a grocery store that, in turn, sells to consumers (the indirect purchasers). Consider the example in Table 4. In Panel A, consumers purchase 100,000 loaves of bread for $2.50/loaf during the anticompetitive period from the grocer, who purchased it from the upstream defendant for $2.00/loaf. Consumers spend $250,000 on bread, and the grocer's profit is $50,000 assuming its only cost is the wholesale price of bread. In Panels B and C, the but-for price to the grocer is $1.75, and the $0.25 price decrease is fully passed through to consumers.

Under perfect competition in downstream retailing, full PT is consistent with two distinct assumptions about but-for supply or demand in the retail bread market.[16] This can be seen by use of a standard PT result involving elasticities, $\frac{s}{s-d}$, which determines how much of an upstream price change can be passed through downstream, where s and d are the elasticity of supply and demand, respectively. For example, in Panel B, a perfectly inelastic demand curve (*i.e.*, d = 0) results in $\frac{s}{s-d}$ equal to 1.0. This indicates full PT to consumers of the $0.25 lower wholesale price.[17] As a result of complete PT with no change in the number of loaves

[14] *See, e.g.,* Martijn A. Han, Marteen Pieter Schinkel, & Jans Tuinstra, THE OVERCHARGE AS A MEASURE OF ANTITRUST DAMAGE (Amsterdam Center for Law & Economics, Working Paper No. 2008-08, Mar. 2009).

[15] For a more detailed treatment of various complicating factors that depart from the greatly simplified example herein, *see, e.g.*, Theon van Dijk & Frank Verboven, *Quantification of Damages*, *in* ABA, III ISSUES IN COMPETITION AND LAW POLICY (Wayne D. Collins, ed., Aug. 2008); George Kosicki & Miles B Cahill, *Economics of Cost Pass Through and Damages in Indirect Purchaser Antitrust Cases*, 50 ANTITRUST BULL. (Sept. 2006).

[16] A different set of considerations applies if firms in the downstream industry have market power.

[17] With *d* = 0, any value of *s* greater than zero will result in full PT.

purchased/sold, the difference in consumers' bread expenditures in the but-for and actual market is equivalent to the standard approach to overcharges as well as to the change in consumer surplus (*i.e.*, $25,000); and the grocer's profit is unchanged.

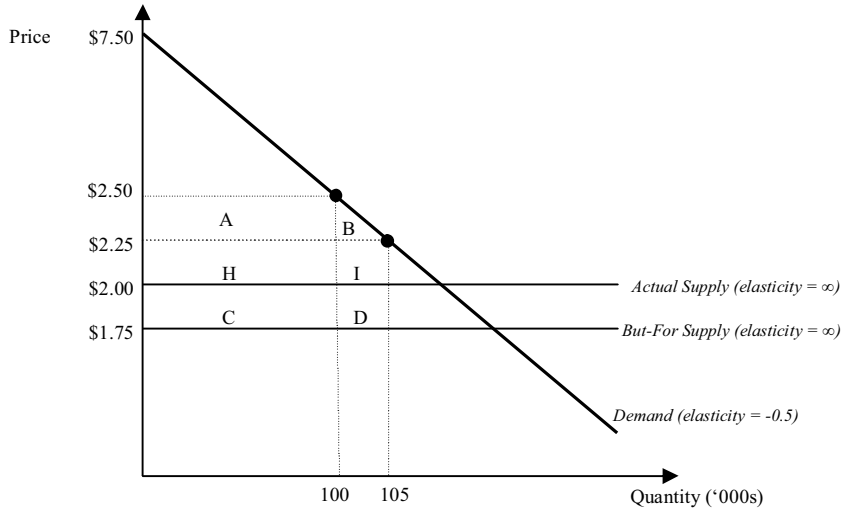
The other condition under which full PT occurs under perfect competition is a perfectly elastic supply curve (*i.e.*, the price elasticity of supply is infinity) together with a downward sloping demand curve (*e.g.*, d = -0.5), as in Panel C.[18] Here, a lower but-for price results in a higher but-for quantity (*i.e.*, 105,000 v. 100,000). Economic damages for consumers based upon consumer surplus are $25,625 as in the example in Table 3 (Panel C), and damages to the grocer based on lost profits is $2,500. This can be seen in Figure 4 where the difference in consumer surplus is represented by area A+B, and the grocer's lost profit is represented by area I+C+D-A (*i.e.*, area H+I+C+D minus area A+H). Therefore, the "total harm" of price fixing in Panel C is captured by area B+I+D+C, or $28,125, based upon the

Table 4: Price-Fixing Example
(Consumers as Indirect Purchasers; Full PT)

Panel A		Panel B		Panel C	
ACTUAL MARKET		BUT-FOR MARKET: **FULL** PT (Perfectly Inelastic Demand)		BUT-FOR MARKET: **FULL** PT (Perfectly Elastic Supply)	
Consumer Retail Price	$2.50	Consumer Retail Price	$2.25	Consumer Retail Price	$2.25
Grocer Wholesale Price	$2.00	Grocer Wholesale Price	$1.75	Grocer Wholesale Price	$1.75
Units Purchased/Sold	100,000	Units Purchased/Sold	100,000	Units Purchased/Sold	105,000
Total Paid (Consumers)	**$250,000**	**Total Paid (Consumers)**	**$225,000**	**Total Paid (Consumers)**	**$236,250**
Cons. Surplus	**$250,000**	**Cons. Surplus**	**$275,000**	**Cons. Surplus**	**$275,625**
Grocer Profit	**$50,000**	**Grocer Profit**	**$50,000**	**Grocer Profit**	**$52,500**
		Supply Elasticity:	n/a	Supply Elasticity:	**infinity**
		Demand Elasticity:	**zero**	Demand Elasticity:	-0.5
Standard Overcharge:		$25,000		$25,000	
Change in Cons. Surplus:		$25,000		$25,625	
Change in Grocer Profits:		$0		$2,500	

[18] With *s* = ∞, any value of *d* will result in full PT; however, the specific value of *d* (along with the linear demand curve assumption) will determine the but-for quantity.

Figure 4: Price-Fixing Example
(Consumers as Indirect Purchasers; Full PT)



difference in grocer profit and consumer surplus between the actual and but-for markets.[19]

Another scenario is one of partial PT. Here, only part of the lower but-for wholesale price is passed on to consumers, with the PT percentage depending on the elasticities of supply and demand in the retail market. For example, as seen in Table 5 (Panel B), assuming d = -0.8 and s = 0.8, $\frac{s}{s-d}$ = 0.5. This indicates that 50% of the $0.25 price decrease (or about $0.13) is passed on to consumers. But, as in Panel C, if demand is more inelastic (*i.e.*, d = -0.2) and s = 0.8, then $\frac{s}{s-d}$ = 0.8. This indicates that 80% of the $0.25 price decrease (or $0.20) is passed on to consumers. Because Panel C is the scenario with a more inelastic consumer demand relative to supply, the but-for retail price will be lower than in Panel B. In both scenarios, however, the difference in consumer surplus is less than the

[19] Jan Boone & Wieland Muller, THE DISTRIBUTION OF HARM IN PRICE FIXING CASES 9 (Center Discussion Paper Series No. 2008-68, Aug. 15, 2008). This result applies if demand is linear and marginal cost is constant.

Table 5: Price-Fixing Example
(Consumers as Indirect Purchasers; Partial PT)

Panel A		Panel B		Panel C	
ACTUAL MARKET		BUT-FOR MARKET: **PARTIAL** PT (Demand Elasticity = -0.8)		BUT-FOR MARKET: **PARTIAL** PT (Demand Elasticity = -0.2)	
Consumer Retail Price	$2.50	Consumer Retail Price	$2.38	Consumer Retail Price	$2.30
Grocer Wholesale Price	$2.00	Grocer Wholesale Price	$1.75	Grocer Wholesale Price	$1.75
Units Purchased/Sold	100,000	Units Purchased/Sold	104,000	Units Purchased/Sold	101,600
Total Paid (Consumers)	**$250,000**	**Total Paid (Consumers)**	**$247,000**	**Total Paid (Consumers)**	**$233,680**
Grocer Profit	**$50,000**	**Grocer Profit**	**$65,000**	**Grocer Profit**	**$55,880**
		Supply Elasticity:	0.8	Supply Elasticity:	0.8
		Demand Elasticity:	-0.8	Demand Elasticity:	-0.2
Standard Overcharge (Consumers):		$25,000		$25,000	
Change in Cons. Surplus:		$12,750		$20,160	
Change in Grocer Profits:		$15,000		$5,880	

standard approach to overcharges ($25,000) because the but-for price for consumers falls by an amount less than $0.25. But, the "total harm" of price-fixing – based upon the difference in consumer surplus and grocer profits between the actual and but-for market – exceeds the overcharge amount under the standard approach. (Total harm equals $27,750 and $26,040 in Panels B and C, respectively).

The difference in the grocer's profits between the but-for and actual market can be seen as follows. The grocer, as direct purchaser, has profits of $\pi = (p_r - p_w) * q$, where p_r is the retail price, p_w is the wholesale price, and q is the number of loaves purchased/sold. As discussed in van Dijk and Verboven (2008), the change in profits $(\Delta\pi)$ between the actual and but-for market for an entity that potentially can pass-through some of its price changes can be expressed as: $\Delta\pi = -q\Delta p_w + q\Delta p_r + (p_r - p_w)\Delta q$. The first term reflects the standard approach to overcharge calculations one might do in a direct purchaser case – the difference between the actual and but-for price (Δp_w) multiplied by the total amount purchased/sold by the grocer (q). Using Panel C as our example, this equals $25,000.[20] The second term captures potential PT. If $\Delta p_w < \Delta p_r < 0$ (recall that Δp_w = -$0.25), there is partial PT of the lower but-for price from the grocer to the consumer, multiplied by the total number of loaves purchased/sold.[21] In our

[20] If $\Delta p_r = 0$ (*i.e.*, there is no PT) then there will be no change in output (*i.e.*, $\Delta q = 0$), and the change in the grocer's profit equals the first term only, or $25,000.

[21] If $\Delta p_r = \Delta p_w$, there is complete PT as in Table 4.

example, this equals -$20,000 (*i.e.*, Δp_r = -$0.20, q = 100,000). The third term represents the profit gain due to the increased sales in the but-for market resulting from the lower but-for price, or $880 (*i.e.*, $0.55 times 1,600). Adding these three amounts together equals $5,880.

Commentators have identified the need to consider but-for quantity issues when contemplating damages for indirect purchasers due to price-fixing. For example, van Dijk and Verboven (2008) state:

> The output effect is frequently ignored by the parties, even when the pass-on effect is considered. Unless the plaintiff's market is perfectly competitive, this is incorrect and may lead to significant understatement of lost profit damages [due to an anticompetitive price increase]. … From a purely economic standpoint, the pass-on and output effects should always be considered, but in most jurisdictions they are not considered in calculating direct purchaser damages.[22]

And, Kosicki and Cahill (2006) point out the need to consider "the effect of the change in the selling price on the quantity sold by the plaintiff…[because] [c]hanges in unit sales can also have a significant impact on damages."[23]

4. Conclusion

This article highlights several instances when consideration must be paid to the shape of the demand curve, as summarized by the price elasticity of demand, in estimating damages when but-for prices or volumes differ from those in the actual market. While the economic relationship between the quantity demanded (or volumes sold) and price has important implications for quantifying price erosion damages, the "law of demand" is also applicable in other non-patent matters. For instance, when plaintiffs allege higher but-for unit sales in a breach-of-contract matter, the but-for price likely will be lower (all else equal). Or, in price-fixing matters where a quantification of the overall economic harm due the anticompetitive conduct is of interest, an estimate of the but-for quantity is required. An important distinction is that while damages based upon lost profits may be reduced when but-for prices or volumes differ from those in the actual market (and when price elasticity is considered (as the examples in Tables 1 and 2 illustrate), the economic harm in price-fixing matters will increase with a higher but-for quantity, due to a lower but-for price, when consumer surplus is the basis for damages (as the examples in Tables 4 and 5 illustrate).

[22] Van Dijk and Verboven, *supra* note 15, at 4.

[23] Kosicki & Cahill (2006), *supra* note 15, at 604.