June 2013

WORKING PAPER SERIES

2013-ECO-10

Do Retroactive Rebates Imply Lower Prices for Consumers?

Frank MAIER-RIGAUD
IESEG School of Management (LEM-CNRS)

Ulrich SCHWALBE
University of Hohenheim, Stuttgart

IESEG School of Management
Lille Catholic University
3, rue de la Digue
F-59000 Lille
www.ieseg.fr
Tel: 33(0)3 20 54 58 92
Fax: 33(0)3 20 57 48 55

Do Retroactive Rebates Imply Lower Prices for Consumers?*

Frank P. Maier–Rigaud † Ulrich Schwalbe ‡

Abstract

Despite a host of recent cases on both sides of the Atlantic, the antitrust implications of retroactive rebates or loyalty discounts are among the most controversial topics in competition law. One of the key beliefs found in the literature is that such schemes lead to lower prices for consumers and that competition authorities therefore need to be particularly prudent in balancing these "obvious" pro–competitive effects against potential foreclosure concerns. Based on a simple model it is shown that retroactive rebates do not necessarily imply lower prices for consumers and that, on the contrary, even total welfare may decline as a result of the introduction of a rebate scheme. In addition to leading to higher prices, rebate schemes may hurt consumers by inducing them to buy a higher quantity than they otherwise would. The belief that rebates increase consumer welfare as they imply lower prices is shown to be based on the fundamentally flawed reliance on the non–rebated base price as appropriate counterfactual.

JEL–Classifications: D42, K21, L12, L42.

Keywords: antitrust, competition, loyalty discounts, loyalty rebates, retroactive rebates, conditional rebates, consumer welfare, producer welfare, competition policy.

*The authors would like to thank Yann Braouezec, Einer Elhauge, Eric Gippini Fournier and Wouter Wils for comments on an earlier draft. This paper is partly based on a presentation given at the European Competition Journal Conference in Oxford, UK in 2009 and the IBC's 14th annual Conference on Dominance and Pricing in Europe in Brussels, Belgium in 2010. Frank Maier–Rigaud was involved in the Tomra and the Intel case as well as in the Article 82 review of DG Competition. The views expressed are not necessarily those of the European Commission.

†Department of Economics & Quantitative Methods, IÉSEG School of Management, Paris, France, Lille – Economics & Management (LEM) – Centre National de la Recherche Scientifique (UMR CNRS 8179) and Université Catholique de Lille, Lille, France.
f.maier-rigaud@ieseg.fr

‡Department of Economics, University of Hohenheim, Germany.
ulrich.schwalbe@uni-hohenheim.de

1 Introduction

The question of the antitrust implications of the use of retroactive rebates[1] by firms with substantial market power has been a prominent issue in the last ten years. After cases such as Michelin II and British Airways[2], retroactive rebates have played a substantial role in the debate surrounding the more economic approach to EU competition law, in particular in the context of the discussion– and the guidance–paper of DG Competition of the European Commission. European cases such as Tomra[3] that pre–date the discussion paper and Intel[4] that predate the guidance paper emphasized the importance of a clear understanding of the antitrust implications of such schemes.[5] The same holds for the United States where cases such as LePage, Masimo and Intel[6] dealt with retroactive rebates and also the Antitrust Modernization Commission (AMC) treated the subject matter in some depth.

The analysis of single product (and even more so multi–product) retroactive rebates is among the most complex types of effects analysis that economists can be confronted with in an antitrust setting.[7] In light of this complexity the following analysis will focus on only one of the many aspects of relevance in the antitrust analysis of retroactive rebates.

[1]For the purpose of this paper (retroactive) rebates are defined as price reductions that are granted retroactively for all units purchased upon reaching a particular quantity threshold. See for example Maier-Rigaud (2005) or Maier-Rigaud (2006). Such rebates are sometimes also referred to as loyalty discounts. See Elhauge (2009a:191f.).

[2]Case T-203/01 Manufacture Française des Pneumatiques Michelin v Commission, judgment of 30 September 2003 and Case T-219/99 British Airways plc v Commission, judgment of 17 December 2003.

[3]See Commission decision COMP/E-1/38.113 Prokent–Tomra; Case T- 155/06 Tomra Systems and Others v Commission, the Opinion of Advocate General Mazak on the Tomra appeal against the General Court and the Judgement C-549/10 P of 19 April 2012 dismissing the appeal. See also Maier-Rigaud and Vaigauskaite (2006) and Peeperkorn and Rousseva (2011).

[4]See Commission decision COMP/C-3 /37.990 – Intel of 13.05.2009. See also Banasevic and Hellström (2010).

[5]See Borlini (2009) for a description of the discussion and the guidance paper (European Commission (2005) and European Commission (2009) respectively) and an extensive review of the literature on rebates.

[6]LePage's Inc v 3M Co., 234 F.3d 141 (3rd Cir.) (2003), Masimo Corp. v. Tyco Health Care Group No. 02-cv-4770-MRP, 2006 WL 1236666 (C.D. Cal. Mar. 22, 2006) and Intel Corp. v. Advanced Micro Devices, Inc., 542 U.S. 241 (2004). On bundled rebates see for example Economides (2012) or Greenlee et al. (2008). Some of the relevant single product cases are Barry Wright v. ITT Grinnell. 724 F.2d 227 (1983), Barr Labs, Inc. v. Abbot Labs, 978 F.2d 98 (3rd Cir. 1992) and Concord Boat Corp. v. Brunswick Corp., 207 F.3d 1039 (8th Cir. 2000).

[7]See Faella (2008:401), Geradin (2009) and Bona (2010:7).

While being necessarily incomplete[8], the analysis provided here does shed some light on the very important issue of whether rebates are really rebates, i.e. if rebates really imply lower prices compared to the appropriate counterfactual price. While this question may appear trivial to some, it is a particularly pertinent question in light of the widely held belief that consumers are benefiting from rebates through lower prices in the short run even in those cases where rebates are ultimately found to be anticompetitive and detrimental to consumers as they result in firms exiting (or not entering) the market or being restricted in their growth. Indeed, it is this type of reasoning that has led to the proposition that rebate schemes are best analysed under a predation test. According to its advocates, this test is adequate and captures the essence of rebates, as the lower prices to consumers are viewed as the direct cause for the exclusion. To the extent that prices are not below an appropriate cost measure (i.e. predatory) such rebate schemes are consequently also not considered problematic.

This paper analyses the claim that, if nothing else, rebates imply lower prices for consumers. This claim is directly related to the question of the appropriate counterfactual price and to the idea that competition authorities should be careful in acting against pricing schemes that may potentially have negative exclusionary effects in the longer run, but are clearly beneficial to consumers in the short term. More specifically the paper will model a simplified case where rebates are used as a means of price discrimination by a monopolist, i.e. in a situation where foreclosure is deliberately excluded from the set of possible motivations and predatory pricing can be ruled out.

While the discussion focuses specifically on establishing an appropriate counterfactual in case of a rebate scheme, it is closely related to the problem of finding the appropriate counterfactual in antitrust cases more generally. Besides the importance of establishing an appropriate counterfactual for establishing an abuse, this question is of particular importance also when the damage caused by a dominant firm has to be quantified.[9] Whether in the context of establishing an abuse or in the context of

[8]The aspect treated here is of course insufficient to determine whether a particular rebate scheme is anticompetitive or not.

[9]See Maier-Rigaud and Schwalbe (2013).

damage claims, the question arises what the situation would have been without the abusive behaviour. In the case of retroactive rebates there are many possible ways to choose pricing schemes that are compatible with competition law but that may lead to very different market outcomes.

From an economic point of view, damages are computed by comparing the profits of all victims of the abusive conduct with the profits that would have been obtained under a hypothetical counterfactual (or but–for scenario) in which the abusive conduct did not occur. The question is: What quantities would victims have produced and at what price would they have been able to sell these quantities. Comparing the profits in the factual and the counterfactual situation provides an estimate of the damages.

In the context of rebates, different possible counterfactuals, depending on the pricing behaviour of the dominant firm, are conceivable. Alternatives could be: linear prices, incremental quantity discounts or two–part tariffs.

The remainder of the article is organized as follows. Section 2 describes the more or less differentiated perspectives on rebates as implying lower prices including the proposition to analyse rebate schemes under a predation test. Based on this review of the literature claiming a nexus between rebates and lower prices, section 3 sets out a simple economic model to demonstrate that propositions according to which prices under a rebate scheme are lower than in the absence of the rebate scheme are generally false. While it is sufficient to demonstrate that prices in any particular rebate scheme are not lower than in the absence of that scheme to disprove this claim, the example given goes further in discussing one of the many particular justifications for rebate schemes, namely price discrimination. The potential consumer and total welfare consequences of retroactive rebates are discussed based on the model. In the final section concluding the article, the rather trivial argument is made that absent any alternative rationale such as exclusion combined with a future softening of competition, a dominant company is unlikely to introduce a rebate scheme that results in lower average (quantity weighed) prices than in the absence of the scheme as this would amount to a profit sacrifice.

The term rebate is misleading as it refers to a price reduction compared to a

reference price (also called base, list or penalty price) that may be substantially above the price that would prevail in the absence of the rebate scheme. Whether rebates do or do not result in benefits to consumers even in the short term is, however, an empirical question. In any case, the undifferentiated claim that prices under a rebate scheme are lower than prices without the rebate scheme is generally false.[10]

2 The "Rebates Imply Lower Prices" Nexus

The following section surveys the literature that directly or indirectly equates rebates with lower prices at least in the short run. Whether this literature is causative of the "rebates imply lower prices" nexus or whether it is simply the outflow of a corresponding general belief is unimportant. What matters, however, is the fact that the everyday use of the term rebate[11] together with this type of superficial reasoning has the potential to foster a biased approach in the antitrust assessment of rebate schemes undermining competition policy objectives and ultimately allowing rebate schemes that may be detrimental to consumer and total welfare.

The aim of this section is therefore to set out in detail and extensively the literature that fosters the "rebates imply lower prices" nexus. Such an extensive review appears necessary to demonstrate that this view is widespread and that such views cannot simply be dismissed as casual and imprecise statements.[12]

[10] See Adam and Maier-Rigaud (2009:140). See also Economides (2009:270) stating that recoupment "is irrelevant because it is not clear that the monopolist actually loses money under the requirement contract compared to the but–for world". See also Lande (2006:869), Greenlee et al. (2008), Economides and Lianos (2009:513) and Elhauge (2009a:216).

[11] The everyday usage of the term "rebate" suggests a price reduction. Rebated supermarket items can be bought at lower than usual prices and to the extent that such items are perishable and close to the expiry date, consumers even get an idea of a possible justification for the rebate. A similar logic apparently applies to "buy one get one free" rebates although the justification for this may be less evident to consumers. In all these cases, the reference for assessing the rebate is seemingly given by the regular undiscounted price. In any case it seems counterintuitive and simply difficult to think of the appropriate counterfactual price as the one that would prevail in a world where such rebating was prohibited. As stated by Elhauge (2009a:216): "The word 'discounts' deceptively suggests otherwise, but the nominal 'discount' is just the difference between the compliant and noncompliant prices that a firm chooses, and does not indicate prices lower than the levels that would have resulted without loyalty discounts."

[12] This section does not explore to what extend early case law may have contributed to the confusion. The notion that cost advantages may be passed on to consumers in the form of rebates for instance in the Michelin II case may be responsible for the idea that retroactive rebates imply lower prices as the debate focussed on the cost conditions that would need to be fulfilled for allowing

Statements such as "Loyalty discounts, for example, can benefit consumers in that they pave the way for lower prices"[13] or "fidelity discounts have the obvious procompetitive effect of lowering prices"[14] can be found in many articles and is voiced by many eminent practitioners, consultants and academics at conferences, during policy discussions and also during hearings and in individual cases.

The following passages are representative of a wide range of articles:

> "At its most basic, loyalty and target rebates involve lower, above–cost prices, which should be encouraged. It should also be recalled that objecting to discounts means that, as a remedy, prices must increase. In addition to offering lower prices, loyalty and target rebate schemes typically have unique pro–competitive features."[15]

> "In other words, concerns only arise if the dominant firm can 'leverage' sales from its assured base across to all or nearly all of customer's requirements and thereby deny a rival the minimum critical efficient entry scale. Even in such cases, it will be necessary to consider whether the foreclosure of rivals is justified by the lower prices available to consumers.."[16]

lower prices in the form of cost efficiencies.

[13]Economist, February 18th 2010 (Unchained Watchdog – Businesses think Europe's trustbusters should be kept on a tighter leash).

[14]Hewitt (2003:145). See also p. 153 "The most obvious potential procompetitive effect of a fidelity discount is shared with every form of discounting". See, however, p. 154 where the author acknowledges that this is a question of a proper counterfactual. The example then given, i.e. that the effective price customers pay in a well–targeted rebate scheme where all buyers qualify for the rebate would probably not change if the scheme were to be abolished, leaves nevertheless some doubts as the essential point of penalty pricing, i.e. base prices above the counterfactual price, is missing.

[15]O'Donoghue (2006:393). Indeed, the "rebates imply lower prices" nexus necessarily also suggests a "remedies imply higher prices" nexus. See also Lambert (2005), OFT (2004) para. 5.1: "The offering of discounts t customers is an important form of price competition and is therefore generally to be encouraged.", or Geradin (2010:120) claiming, in the context of the EU Intel case, that "the benefits of preventing dominant firms from cutting their prices on the ground that this may preserve competitors that may later force the dominant firms to provide for even lower prices are speculative as they penalise customers in the short term for hypothetical benefits that may not ever emerge in the long term."

[16]O'Donoghue (2006:373). See also p. 381, 382, footnote 39 and the title of the paper "Over–regulating lower Prices: Time for a rethink of pricing abuses under Article 82 EC". A similar position has also been taken in US cases such as Atlantic Richfield Company v. USA Petroleum Company, 495 U.S. 328, 340 (1990), Brooke Group, 509 U.S. (1993) at 223, State Oil Co. v. Khan, 522 U.S. 3, 15 (1997), Weyerhaeuser Co. v. Ross-Simmons Hardwood Lumber Co., 549 U.S. (2007) at 319, Pac. Bell Tel. Co. v. Linkline Commcations Inc., 129 S. Ct. (2009) at 1120 and Concord Boat, 207 F.3d (2000) at 1060 where in the context of market share discounts the U.S. Supreme

A similar view has also been taken with respect to bundled rebates by Crane and Wright (2009:209):

> "As a general matter, bundled discounting schemes lower prices to consumers unless they are predatory – that is to say, unless they exclude rivals and thereby permit the bundled discounter to price free of competitive restraint"[17]

The idea that rebates imply lower prices has also created concerns with respect to type I errors and has led some authors to argue that they should not only be presumed legal but even encouraged:

> "The risk of false convictions of benign or efficient practices also seems high, since, as noted, lower prices should generally be encouraged."[18]

> "If anything, lower prices that remain above cost should in nearly all cases be presumed legal and efficiency–enhancing"[19]

In an effort to trivialize the debate and again taking the "rebates imply lower prices" nexus for granted, other authors have argued that:

> "A low price, if it is low enough, will always create 'fidelity' or 'loyalty' in the obvious, lawful sense that it encourages buyers to purchase from

Court states "[l]ow prices benefit consumers regardless of how those prices are set, and so long as they are above predatory levels, they do not threaten competition."

[17]This is in contrast to Wright (2013) stating that "in my view, exclusive dealing law is superior to price-cost legal standards for evaluating loyalty discounts. [...] Price-cost tests .. simply do not comport with the underlying economics of exclusive dealing" (p. 33) and "it would be a curious choice indeed to choose deliberately a rule that ignores economic analysis telling us that anticompetitive exclusion can occur even in scenarios where price is above a relevant measure of cost" (p. 19).

[18]O'Donoghue (2006:395). Similarly on p. 424 "*Lower prices should in nearly all cases benefit from a strong presumption of legality.* The situation should only be different where it is clear that, in the specific context of the market under consideration, they distort competition in some material way between customers or create a handicap for competitors that is *not merely the result of the dominant company's offering a lower price.*" (emphasis added) and p. 425 "... denying consumers the benefit of a lower price – whether based on reaching a target or otherwise – will rarely be justified". See also Kobayashi (2005:115) warning of "the high costs of erroneously condemning behaviour that would lower prices and increase welfare".

[19]Temple Lang and O'Donoghue (2002:111). The authors also state that "It is also clear that any interpretation, which discourages a dominant company from lowering its price, even in one individual transaction, should be looked at very critically. Low prices for some sales are better than no low prices at all." See Temple Lang and O'Donoghue (2002:105).

the supplier offering the best terms."[20]

Others have written that rebates "may give rise to efficiencies and, in any event, benefit customers since absent the rebate they may pay a higher price."[21] This type of statement either implies the incorrect use of the base or list price as counterfactual or introduces an inappropriate benchmark for assessing consumer benefits. If one excludes the latter, the following passage can only be explained by the belief that rebated prices are necessarily lower than those that would prevail absent the rebate scheme:

> "Finally, it should not be forgotten that rebate schemes provide a direct benefit to the buyer which may also be passed on to final consumers. Indeed, as the rebate reduces the marginal costs of an input, the buyer should have an incentive to pass on at least part of the price reduction resulting from the rebate."[22]

A partial explanation of these views could be the fact that buyers are in a dilemma situation. As Kjølbye (2010:67) rightly writes:

> "Rebate schemes are attractive to buyers and sellers alike. For buyers the attraction is obvious; they obtain a price reduction which they might not otherwise get. That is the reason why rebates are often granted at the instigation of the buyer even when the seller is in a dominant position"

[20] O'Donoghue and Padilla (2006:395). See also p. 396 where it is stated that "A low price always represents a competitive challenge for competitors". O'Donoghue and Padilla do, however, concede that rebate schemes "may be a cheaper form of exclusion than strategies such as predatory pricing, since the dominant firm does not need to invest in loss–making activities in the case of loyalty discounts" (p. 379).

[21] Kjølbye (2010:67).

[22] Kjølbye (2010:77). "rebate schemes may give rise to various types of efficiencies that benefit consumers. The most direct benefit is the reduction in input costs which are likely to be passed on, at least to some extent." (p. 78). While there may indeed be efficiencies (or advantages) for the firm using rebate schemes, the question of whether such efficiencies become relevant under a consumer welfare standard (or even a total welfare standard) is an altogether different question. Clearly consumer benefits cannot be calculated based on the list or base price on which rebates are granted but need to take the proper counterfactual as reference. An analysis based on the base price is static and can only shed light on why firms would prefer a rebated price over the base price but is incapable of shedding any light on the question whether any particular rebate should be sanctioned under competition law.

This attraction does, however, not derive from the presumed lower prices under rebates but rather from the trivial observation that a buyer obviously prefers the rebated price over the non–rebated list price.

Not only individual authors have argued along these lines. Indeed the debates in the Antitrust Modernization Commission in the US nicely summarize the views already presented above:

> "Even when offered by firms with monopoly power, or by firms that have the prospect of achieving such power, single–product loyalty discounts *can* benefit consumers by *reducing prices and increasing output beyond what the monopolist would otherwise have charged or produced, leading to more efficient resource allocation*."[23]

That this is not a mere hypothetical consideration of no practical relevance becomes clear in the analysis of Barry Wright Corp. v. ITT Grinnell Corp. With respect to this case, the Section 2 Report states:

> "The theoretical possibility that such prices could harm competition did not justify the risk of deterring procompetitive price cutting by entertaining that possibility in litigation."[24]

The AMC discussion underlying the Section 2 report seems to conclude that:

> "The principle that '[d]iscounting is presumptively procompetitive and should be condemned only in the presence of significant market power and proven anticompetitive effects' guides Professor Hovenkamp's analysis. A number of panelists supported Professor Hovenkamp's approach, primarily based on concerns about administrability and risks of chilling desirable discounting behavior."[25]

[23] U.S. Dep't of Justice (2008:106), emphasis added. Note that the report was subsequently withdrawn.

[24] U.S. Dep't of Justice (2008:108). Note that the report was subsequently withdrawn.

[25] U.S. Dep't of Justice (2008:112). Note that the report was subsequently withdrawn. See also Waelbroeck (2005:150): "Imposing too strict a test on dominant companies as to their rebate schemes can indeed have the effect of chilling price competition, protecting possibly inefficient competitors and raising prices to consumers".

This is reminiscent of the view that "a requirement that discounts must be justified could chill price competition where firms are discouraged from employing beneficial discounts due to the burden of having to justify them to the authorities"[26] linked to the claim that the "fact that all rebate schemes involve a potential benefit in the form of lower prices means that prohibiting rebate schemes without proof of likely consumer harm from the scheme in question will itself lead to consumer harm in a significant percentage of cases".[27]

The idea that rebates are "presumptively procompetitive" was apparently not the unanimous opinion of the AMC as summarized in the Section 2 report as "some panelists were critical of the predatory–pricing approach"[28] and at least raised the question about "the empirical evidence that discounts in these situations usually are procompetitive"[29] Apparently the concern was only with empirical evidence as theoretical concerns were not expressed.[30] In the end, this line on rebates may have contributed to the withdrawal of the Section 2 report and the conclusion that the report "goes too far in evaluating the importance of preserving possible efficiencies and understates the importance of redressing exclusionary and predatory acts that result in harm to competition, distort markets, and increase barriers to entry."[31]

In a nutshell, the picture painted in the cited literature is as follows: As it is generally inefficient to discourage discounting and lower prices in particular in light of the direct benefits of such price reductions accruing to consumers, rebate practices should not only be presumed legal but should possibly even be encouraged. Even in the presence of exclusionary effects, the risk of chilling desirable price competition is high and type I errors particularly costly to society. In any case, however, the

[26]Office of Fair Trading (OFT) (2005) para2.29.

[27]Kallaugher and Sher (2004:282).

[28]U.S. Dep't of Justice (2008:112). Note that the report was subsequently withdrawn. Hovenkamp (2006) is probably the most prominent advocate of treating rebates under a predation test (including recoupment in subsequent periods) but in contrast to some of the more recent proposals does not even calculate the cost on some range but over all products sold. He concludes (2006:861) "The social cost of an overly aggressive rule is not simply the damages paid by one unlucky defendant, but also the billions of dollars that consumers will subsequently lose when firms are warned away from aggressive but competitive price cutting."

[29]U.S. Dep't of Justice (2008:113). Note that the report was subsequently withdrawn.

[30]The present paper discusses at least one theoretical reason that sheds substantial doubts on some of the sweeping statements cited above.

[31]Varney (2009:7).

obvious (!) benefits that consumers derive from lower prices need to be seriously considered and weighed against possible foreclosure effects rendering even exclusionary rebate schemes pro–competitive as long as the claimed price reductions outweigh the foreclosure effects.

The essential common element in the passages cited above is the belief that rebates necessarily result in lower prices to consumers and that any competition law intervention therefore necessarily implies price increases. That this belief is theoretically false is shown in the model presented in the next section.

Some intuition on why this belief may be flawed can already be gained by considering the following question that typically remains unaddressed: Why would a company want to follow an approach that essentially consists in reducing prices for nothing in return?[32] Referring to passed on efficiency gains as such does not solve this problem as they would need to be specific to the rebate scheme in order not to affect the linear price counterfactual equivalently. The following section demonstrates that there is no free lunch and that indeed firms with market power, just as those without, do not offer rebate schemes if such schemes do not allow for higher profits.

3 A Simple Model

What almost all the claims and statements discussed above had in common was the underlying belief that retroactive rebates (ultimately) imply lower prices for consumers and that a competition authority operating on the basis of a consumer welfare standard should be particularly careful in analysing such pricing schemes as foreclosure effects must be substantial before (short term) benefits to consumers are outweighed by the (long term) negative repercussions of reduced competition due to foreclosure.

Before demonstrating, based on the model to be developed below, that these claims are false, a short discussion of the pertinent economic literature on this ques-

[32] Indeed, even with foreclosure effects, it has been argued that the price reductions could outweigh the competitive harm, leading to the same question as this implies that subsequent recoupment is necessarily only partial.

tion is useful as it puts the arguments that will follow into proper perspective.

Already Klemperer (1987) noted in his analysis that switching costs, generated by rebate schemes, contribute to the reduction of the elasticity of consumer demand and therefore may lead to higher equilibrium prices. Similarly Nalebuff (2005:322) and Economides (2009:270) argue that the reduced price transparency due to rebates may decrease competition and lead to higher prices. Elhauge (2009a) shows that rebates can raise prices for all buyers even if there are economies of scale due to the reduced incentive to compete for non–loyal buyers. Elhauge and Wickelgren (2012a) argue that retroactive rebates (or loyalty discounts without buyer commitment) soften competition and raise equilibrium prices as any reduction in prices for free buyers would require a price reduction also for loyal buyers.[33] Lin (1990) shows that to the extent that rebates induce loyalty, this may reduce in–store interbrand competition and thereby influence the perception of the elasticity of demand by producers, again leading to higher equilibrium prices. Similarly to the simple model below, Greenlee and Reitman (2005) demonstrate the possibility of penalty pricing, i.e. increases in the base or list price compared to the proper counterfactual price that penalizes consumers that do not achieve the threshold without necessarily benefiting those that do, in a richer setting. See also Feess and Wohlschlegel (2010) for a discussion of entry foreclosure and rent shifting under rebates and Calzolari and Denicoló (2013) who discuss the double marginalization effect of market share rebates under incomplete information about demand in a duopoly setting entailing higher prices and consumer harm.[34]

Although foreclosure is of course the ultimate reason that retroactive rebates are considered problematic under most competition law provisions, the model considered below explicitly excludes this possibility. As there is only one firm on the market and entry is not considered, foreclosure cannot occur and predation is ruled out. This simplifying assumption is justified, as the question to be analysed concerns the pricing decisions of a firm with substantial market power using retroactive rebates

[33]Elhauge and Wickelgren (2012b) treat the case where buyers have to commit to the loyalty discount and can therefore no longer switch to a rival.

[34]In addition to this theoretical work there is also a growing experimental literature. See Beckenkamp and Maier-Rigaud (2006), Maier-Rigaud and Beckenkamp (2007) and Morell et al. (2009)).

and possible alternative pricing schemes and more specifically the question whether under a rebate scheme prices are lower than in the absence of a rebate scheme. The argument that a simple monopoly model does not fit the relevant scenarios as it does not allow foreclosure is unconvincing. As almost all cited authors recognize, foreclosure is a possibility that may or may not tilt the balance towards prohibition. It is not viewed as essential for low prices to obtain and on the contrary, lower prices are supposed to be capable of at least potentially mitigating possible foreclosure effects. As a result, the absence of foreclosure should render the retroactive rebate scheme discussed even more innocuous.[35]

Consider a market with two types of consumers, denoted by h and i (standing for household and industrial consumers respectively). A monopolist producer offers its product to both groups of consumers. Without loss of generality, assume that the monopolist operates with marginal cost of 0. While the monopolist is aware that there are two types of consumers, it cannot distinguish or identify whether any particular consumer belongs into one or the other category. Furthermore no arbitrage between consumers is assumed, i.e. products cannot be resold.

In order to study the question at hand, it is further assumed that the monopolist can either charge a profit maximizing linear price p^m, i.e. a constant unit price for all consumers or offer a rebate scheme price schedule. The only possible justification for using a rebate scheme in this model is that it increases profits for the monopolist in comparison to the profits obtained under the linear monopoly price. In other words, the rebate scheme allows distinguishing between the two groups of consumers so that the monopolist can price discriminate, i.e. charge different prices to the two types of consumers. This is an important point, as the proper price counterfactual is exactly what is typically overlooked. While other pricing schemes could serve as appropriate counterfactual, the linear monopoly price will be considered the proper counterfactual price here. Furthermore, it is assumed that the monopolist only has the option to adopt a rebate scheme with one step, i.e. a list price and a rebated price granted retroactively on all units once the rebate threshold is reached. This

[35] Obviously, the retroactive rebate scheme discussed here would not be offered by a dominant firm if equally efficient and otherwise unconstrained competitors could easily undercut prices by charging the counterfactual linear price.

assumption will be relaxed later so that the monopolist will be able to offer two different rebates associated with different thresholds in addition to the list price.

Consider the following two linear demand functions, also depicted graphically in 1[36] representing the respective aggregate demand of the two types of consumers, i and h where $a_i > a_h$ with a_i, a_h, b_i, $b_h \in \mathbb{R}_{++}$:

$$D_h(p) := a_h - b_h p$$

$$D_i(p) := a_i - b_i p.$$

Loosely speaking consumers of type i have an overall low valuation of the product but are willing to buy large quantities whereas consumers of type h have a higher valuation of the product but buy only low amounts of the product. Type i consumers, i.e. industrial users of the product in question demand large quantities but will switch larger and larger portions of their demand to cheaper substitutes as prices increase. Type h consumers, i.e. households, will buy relatively moderate quantities of the product even at very low prices.

The monopolist faces the aggregate demand $D(p)$ depicted in Figure 2 that is obtained by simply aggregating the two demand functions vertically.

The profit maximizing price for the monopolist under linear pricing is given by the following maximization problem:

$$\max_p D(p)p = p((a_h - b_h p) + (a_i - b_i p)).$$

Assuming that demand is such that both markets are covered, the resulting profit maximizing price is given by

$$p^m = \frac{a_h + a_i}{2(b_h + b_i)}.$$

Inserting p^m into the aggregated demand function one obtains the total quantity that is given by

[36] All Figures throughout this text are based on the following real valued demand functions: $D_h(p) := 100 - p$ and $D_i(p) := 900 - 25p$.

Figure 1: Demand Schedule depicting demand of type 1 and type 2 customers

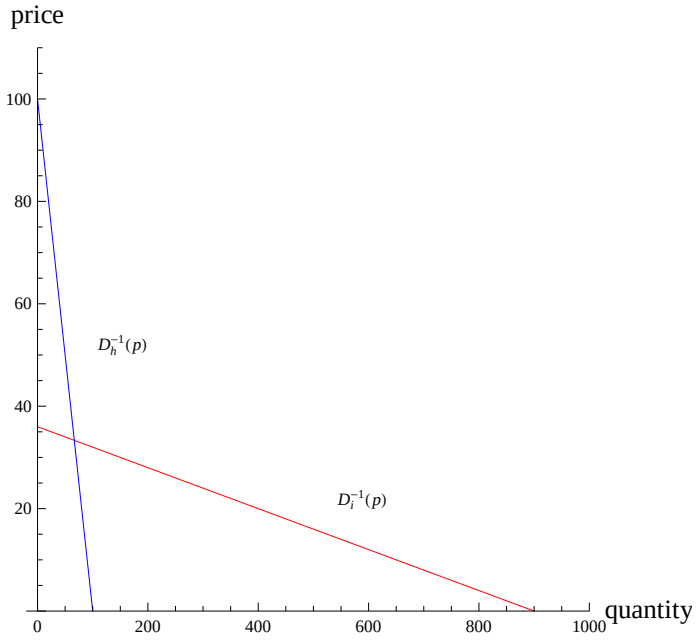
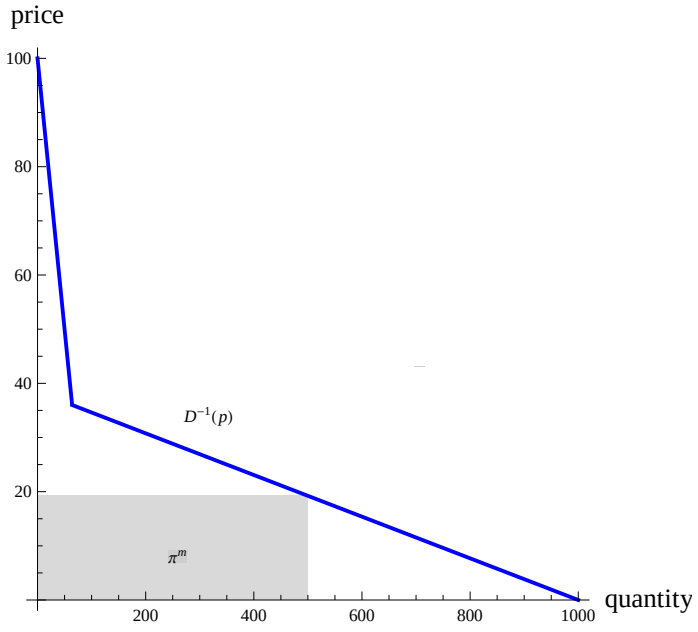


Figure 2: Aggregate demand, monopoly price and corresponding producer surplus



$$q^m = \frac{a_h + a_i}{2}.$$

The monopoly profit π^m is given by

$$\pi^m = \frac{(a_h + a_i)^2}{4(b_h + b_i)}.$$

As marginal costs are normalized to zero, the profit is identical to the producer surplus depicted as grey area in Figure 2.

Consider now the introduction of a retroactive rebate scheme where, subject to a certain threshold being reached, the effective price to be paid is given by p^r with

$$p^m < p^l \geq p^r \equiv p^l(1 - r),$$

where p^m is the linear price, p^l denotes the list price and $p^r \equiv p^l(1 - r)$ is the rebated list price with $r \in [0, 1]$ being the rebate. Obviously, a possibility for the monopolist to earn more than the monopoly profits associated with a linear pricing schedule is to exploit the possibility of second degree price discrimination.[37] Second degree price discrimination can be implemented via a retroactive rebate scheme that would allow expanding the quantities sold to i types by reducing the price for these consumers while maintaining or even increasing prices for the h types that have a relatively higher willingness to pay and will not buy a large quantity.

The profit maximization problem when the monopolist can implement a retroactive rebate scheme is given by the following expression. Strictly speaking this equation gives the optimal prices at a given rebate r. In order to find the optimal rebate, the problem has to be solved in two steps. First the optimal price as a function of r is found and then profits are maximised.

$$\max_{p^l} p^l(a_h - b_h p^l) + p^l(1 - r)(a_i - b_i p^l(1 - r)).$$

From the first order conditions we get a list price $p^l(r)$ as a function of the rebate

[37] Second degree price discrimination refers to a situation where consumer groups can only be distinguished based on their self–selection. This is different from first degree price discrimination where the monopolist knows the individual demand schedules and can fully discriminate between consumers and from third degree price discrimination where consumer groups such as students or senior citizens can be distinguished. Second degree price discrimination is related to non–linear pricing where consumers are incentivized to self–select and reveal their (approximate) willingness to pay based on quantity and/or quality. See the lassic paper by Maskin and Riley (1984) also discussing rebates in a monopoly setting with incomplete information.

r with

$$p^l(r) = \frac{a_h + a_i(1-r)}{2(b_h + b_i(1-r)^2)}.$$

Given that the rebated price is given by $p^r = p^l(1-r)$, demand at these prices is

$$q(r) = (a_h + a_i) - \frac{b_h + b_i(1-r)(a_h + a_i(1-r))}{2(b_h + b_i(1-r)^2)}.$$

The profit of the monopolist, as graphically depicted in the producer surplus of Figure 4, is then given by

$$\pi(r) = \frac{(a_h + a_i(1-r))^2}{4(b_h + b_i(1-r)^2)}.$$

In order to allow the self–selection of these two types of consumer groups into those that will benefit from the rebated price because their willingness to pay is such that they will reach the threshold that triggers the rebate and those that will not be willing to buy a sufficiently large quantity to get a rebated price and will therefore pay the list price p^l will be called the critical quantity. This critical quantity is denoted by c. As we will see it is not identical to the rebate threshold. The reason for this is that the critical quantity only assures the self–separation of the consumers into the group of those buying a sufficient quantity to qualify for the rebate and those that prefer to buy a lower quantity at the non–rebated list price.

The critical quantity has to satisfy two conditions. It first has to lie below the quantity that type i consumers would demand at the rebated price p^r and second, it has to be larger than the quantity demanded by consumers of type h at p^r:

$$a_h - \frac{b_h(1-r)(a_h + a_i(1-r))}{2(b_h + b_i(1-r)^2)} < c < a_i - \frac{b_i(1-r)(a_h + a_i(1-r))}{2(b_h + b_i(1-r)^2)}. \qquad (1)$$

Furthermore, for the retroactive rebate scheme to be in the interest of the monopolist, the profits under the rebate scheme have to be at least equal to those under the linear pricing scheme. This is a very important point as it excludes the

possibility of lower prices under the rebate scheme as long as the firm is not modelled as willing to take profit reductions.[38] If profits under the rebate scheme have to be at least as large as profits under the linear pricing scheme, weighed revenues and therefore also weighed unit prices have to be at least as large as under linear pricing.[39]

Formally the condition for profits to be greater under the rebate scheme than under linear prices can be written as:

$$\pi(r) = \frac{(a_h + a_i(1-r))^2}{4(b_h + b_i(1-r)^2)} > \pi^m = \frac{(a_h + a_i)^2}{4(b_h + b_i)}. \tag{2}$$

Assuming the particular parameter values given in footnote 35 above that were also used to draw Figure 1 through 4, we get the following optimal results for the two scenarios, i.e. the linear pricing and the rebate pricing scheme.

If the monopolist is constrained to the linear monopoly price, $p^m = 19.23$ with a respective total quantity demanded of approximately 500.[40] The resulting profit is $\pi^m = 9615.38$. This is depicted as grey area in Figure 2 above.

The profit depends on the rebate as can be seen in Figure 3:

Maximizing the profit with respect to the rebate yields the profit maximizing rebate $r^* = 0.64$. The optimal rebate pricing scheme is characterized by the following equilibrium prices and quantities also depicted in Figure 4 below:

$$p^{r*} = 18 \quad \text{with} \quad q^{r^*} = 450 \tag{3}$$

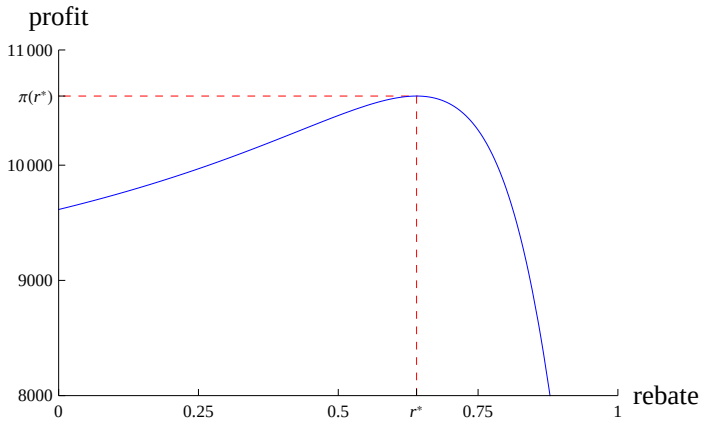
$$p^l = 50 \quad \text{with} \quad q^l = 50. \tag{4}$$

[38] The notion of lower prices has not yet been properly defined. While the counterfactual price is given by p^m, there is no unique price under the rebate scheme under price discrimination. If one denotes by p^l the price that households pay and by p^r the effective price that industrial users pay net of the rebate, it is not clear how to compare prices. The appropriate comparison to determine whether prices are higher, equal or lower under the rebate scheme is given by weighing the two prices under the rebate scheme by the quantities sold at these prices. While this is the appropriate way of measuring price effects, it is not clear whether under EU competition law, the two consumer groups can be amalgamated for purposes of calculating whether efficiencies are passed on to consumers. If some consumers loose and some consumers win, even an amalgamated positive effect may be insufficient to pass the legal test.

[39] This points to one potential source of efficiencies, namely economies of scale, i.e. declining marginal cost.

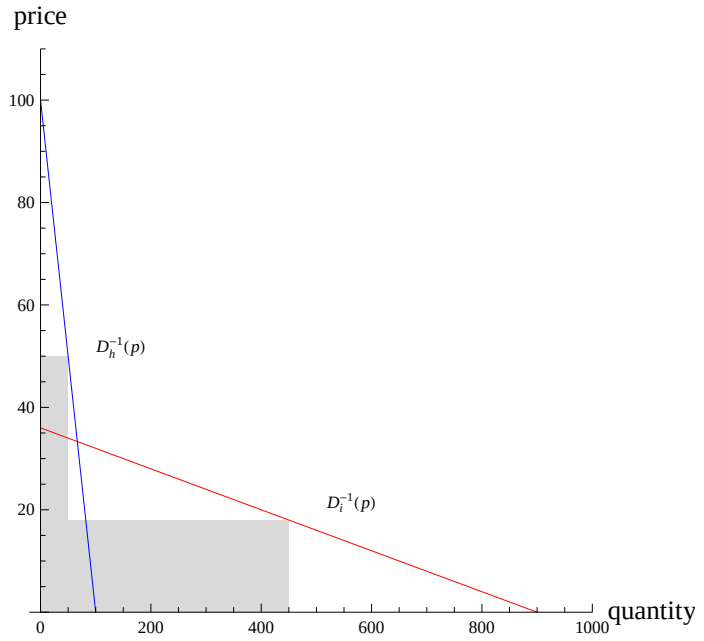
[40] The quantity demanded by industrial consumers is given by $q_i(p^m) = 419.25$ and the quantity demanded by households is given by $q_h(p^m) = 80.77$.

Figure 3: Profit as a function of the rebate



The resulting profit is $\pi^{r^*} = 10600$.

Figure 4: Demand by type of consumer and corresponding producer surplus under rebate scheme



While the list price is substantially above the linear monopoly price of 19.23, the effective price when the rebate is triggered is below the linear price. The weighted average price under the rebate scheme is given by $p^a v = 21.2$.[41] As previously

[41] The weighted average price is easily calculated by multiplying the respective prices by their

discussed this average weighted price is necessarily higher than the linear price as otherwise condition 2 cannot be fulfilled, i.e. the firm is unwilling to switch to rebate pricing if this reduces profits.

The critical quantity fulfilling the conditions set out in 1 above is given by $82 < c < 451$. All rebate thresholds that lie within this range will lead to a separation of consumers into the group of household consumers that will not qualify for the rebate and the group of industrialist consumers that will qualify for the rebate. Absent uncertainty of the actual demand functions of both groups, all thresholds in this range will also be optimal.

An interesting case arises when the non-optimal rebate $r = 0.3$ is chosen. While that rebate would still satisfy 1 and therefore the monopolist would prefer a rebate scheme with a rebate r of 0.3 to a linear pricing scheme, his profits are not maximized with that rebate rate. In that case the list price is given by $p^l = 27.55$ and the rebated price is given by $p^r = 19.28$ with profits $\pi^r = 10054.72$.[42] The interesting result of this particular parameter constellation is that it proves the existence of non–optimal rebate schemes that increase a monopolists' profit in comparison to a linear scheme but that lead to both, the list price and the rebated price, to be above the original linear price. In that case there is not only one group of consumers that benefits while the other loses out, but both consumer groups are worse off under the rebate scheme than under linear pricing.

The discussion of rebates so far implicitly proceeded on the assumption that there is no free disposal implying that rebate thresholds could not be set above the quantity that buyers would want to purchase at the rebated price. This excluded the possibility for the monopolist to force buyers into strategic overbuying. Assuming no free disposal implies that a disposal of units is prohibitively costly.[43] If that is the

corresponding quantities and dividing by the total quantity, i.e. $\frac{450\times 18+50\times 50}{500} = 21.2$.

[42] Corresponding quantities are given by $q_i(p^r) = 417.92$ and the quantity demanded by households is given by $q_h(p^l) = 72.45$.

[43] An empirical example of no free disposal may be milk for milk producers where it is more expensive to destroy the milk or slaughter the cattle than to use the milk for the production of less profitable or inferior products such as milk powder for example (on this see for example the dairy merger between Arla and Milko and the press release from the Swedish competition authority at $http://www.konkurrensverket.se/t/NewsPage\_\_\_\_7730.aspx$). For all practical purposes, free disposal or at least relatively cheap disposal seems a more reasonable assumption in particular in a scenario where arbitrage, i.e. resale, is excluded by assumption. Note, however, that in the subsequent analysis buyers still derive some utility from the quantities they would normally not

case, consumers will only buy the quantity demanded at a given price.[44] With free disposal, however, consumers have the option to strategically buy additional units, beyond the quantity that they would demand at that price, in order to qualify for a rebated price. In this case, consumers would overbuy as long as their consumer welfare is at least equal to the surplus they would enjoy buying at the alternative prices with the corresponding optimal quantity.[45]

Under free disposal, the critical quantity range shifts up as consumers will be willing to buy additional unwanted units simply to qualify for the rebate and will do so as long as they are at least as well off as under the list price.[46] In contrast to the situation in the absence of free disposal, however, there is a unique optimal rebate threshold. While in the absence of free disposal the monopolist is indifferent to the exact threshold as long as the two consumer groups separate because only the quantities corresponding to the respective prices will be demanded, the monopolist under free disposal can do better than simply separating the two groups and sell the quantities associated with the prices. Under free disposal, the monopolist can force the i–type consumers to buy more units than they would want to buy at the rebated price as long as the reduction in consumer welfare associated with such an increase in quantity leaves the consumers at least as well off as they would be in the absence of the rebate. The optimal rebate threshold under free disposal will therefore be set at the highest quantity that leaves the i–type consumers indifferent between the two prices, implying a higher quantity than they would demand at that price and thereby completely exhausting the consumer welfare difference between the list price and the rebate scenario. The threshold that would just make a type

purchase. If that is not the case, the possibility to induce higher purchases is reduced.

[44]This amounts to buyers choosing between the non–rebated price and corresponding market clearing quantity and the rebated price and corresponding market clearing quantity.

[45]Note that in case of free disposal, buyers still derive some utility for the additional items purchased as long as the quantity purchased does not exceed the amount they would have bought at a price of zero. In other words, unless the total quantity bought exceeds the quantity bought at a price of zero, the willingness to pay for the additional products is not zero although it is of course below the price charged.

[46]Consider the situation where the threshold remains just in the lower range calculated under no free disposal above, let's say at 84 units. If that were the case, no separation of consumer groups under free disposal would occur as h–type consumers would be better off buying 84 units to qualify for the rebated price and throw away the additional units (i.e. the difference between the amount they would buy at the rebated price, i.e. 82 and the amount they need to buy now, i.e. 84, implying that two units will be disposed of) than to buy 50 units at a price of 50.

i consumer indifferent between buying the threshold quantity at the rebated price and buying the quantity of its choice at the undiscounted list price is given by[47]:

$$\frac{1}{2}(\frac{a_i}{b_i} - p^l)^+ q_i(p^l)^+ = \frac{1}{2}(\frac{a_i}{b_i} - p^r)q_i(p^r) - \frac{1}{2}[(t^{*+} - q_i(p^r)^+)(p^{r+} - \frac{a_i - t^{*+}}{b_i}] \quad (5)$$

The following notation is used $x^+ = \max\{0; x\}$ to assure that surplus, prices and quantities do not become negative. The left hand side of the equation is the consumer welfare of industrial buyers at price p^l and corresponding quantity $q_i(p^l)^+$. The first multiplicative term on the right hand side of the equation is the consumer welfare of industrial buyers at price p^r and corresponding quantity $q_i(p^r)$. The last expression on the right hand side gives the utility derived from the strategic overbuying, i.e. the utility derived for those units that would normally not be bought as the price exceeds the willingness to pay. Replacing $q_i(p^l)$ with $a_i - b_i p^l$ and $q_i(p^r)$ with $a_i - b_i p^l(1-r)$, dropping the notation x^+ and solving for t we get:

$$t(p^l, r) = a_i - b_i p^l(1-r) + \sqrt{b_i p^l(2a_i - b_i p^l(2-r))r}$$

Based on this indifference condition we can rewrite the profit maximization problem of the monopolist under free disposal.

$$\max_{p^l, r} p^l(a_h - b_h p^l) + t(p^l, r)p^l(1-r).$$

As this expression can only be solved numerically, we rewrite the indifference condition in terms of the optimal rebate as a function of the list price and the threshold

$$r(p^l, t) = \frac{(b_i p^l + t - a_i)^2}{2b_i p^l t}.$$

The profit maximization problem is then

[47]Technically there are two cases that need to be distinguished, namely where the optimal threshold is strictly above the quantity demanded by industrial buyers at price zero, i.e. $t^* > q_i(0)$ and the situation that turns out to be the relevant one, namely where $t^* = q_i(0)$. Only the latter case is presented.

$$\max_{p^l,t} p^l(a_h - b_h p^l) + tp^l(1 - r(p^l, t)).$$

From the first order conditions we get

$$p^{l*} = \frac{a_h + a_i}{2b_h + b_i}$$

and

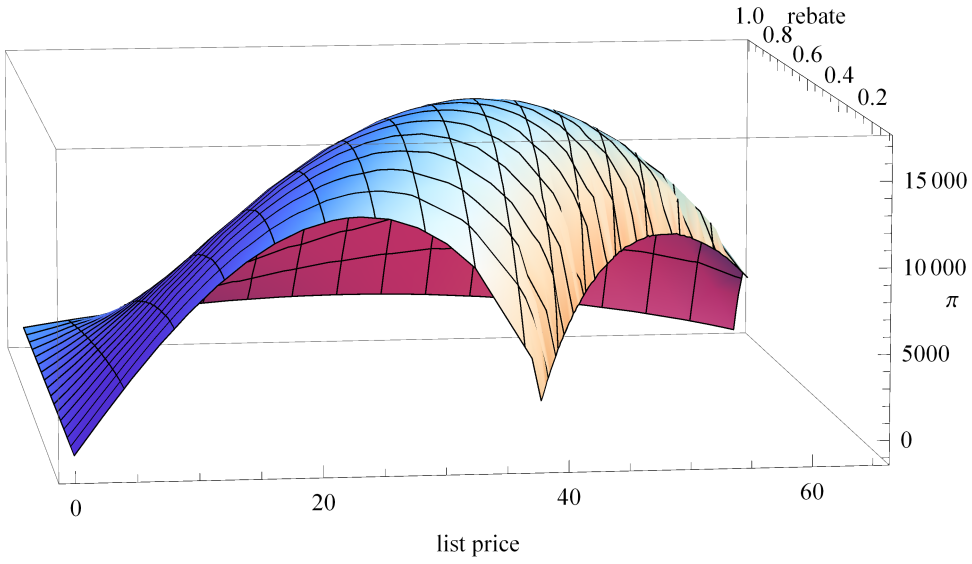
$$t^* = a_i.$$

The corresponding optimal rebate is

$$r^* = \frac{b_i(a_h + a_i)}{2a_i(2b_h + b_i)}.$$

The profit of the monopolist as a function of p^l and r is depicted in Figure 5[48].

Figure 5: Monopoly profits under free disposal as a function of p^l and r



[48]To allow for an interior solution, b_h is set equal to 2. This implies that the monopoly price for households will be lower than the maximal willingness to pay of industrial buyers. The equilibrium depicted is characterized by $p^r \cong 17.98$ ($r \cong 0.48$), $p^l \cong 34.48$, $q_i = t^* = 900$, $q_h = 31.03$. The resulting consumer surplus of industrial buyers and households is approximately given by 28.8 and 1016.65 respectively. Monopoly profits (producer surplus) is $\pi^m = 17241.38$. Total welfare is approximately 18286.83.

Free disposal adds an additional element to the decision–making of the monopolist. Without free disposal it was only possible to set a list price and grant a rebate from a particular threshold on and this threshold had to be linked to the demand at the rebated price in order to be attractive to the industrial consumers. Under free disposal, the threshold of the rebate can be adjusted upwards to capture more of the consumer welfare than under monopoly as calculated above.

Extending the model further by allowing a rebate scheme with two rebate thresholds, it is possible to set a prohibitive list price for both consumer groups and specify two rebated prices associated with two different thresholds leading to an overbuying of both consumer groups. As long as the rebated price/ threshold pairs lead to a separation of consumer groups as discussed before, this may even allow the monopolist to extract the entire surplus of both consumer groups.

Based on the numerical values used throughout this paper, we can easily see how a combination of prices and thresholds can achieve this result.[49] Setting the thresholds at the quantities that would be purchased by the respective groups at a price of zero and charging a price that fully exhausts the willingness to pay[50] of the respective consumer group, the monopolist is capable of appropriating the entire welfare in that market. For example, setting a list price at $p^l > 100$ ensures that none of the two groups will be interested in making any purchase outside the rebate schemes offered. If in addition a rebated price of $p_h^r = 50$ and $p_i^r = 18$ with corresponding thresholds of $t_h^* = 100$ and $t_i^* = 900$, i.e. twice the amount that the two consumer groups would want to purchase at that price in the absence of free disposal, are offered, both groups will self–select into the respective rebate scheme. This will entail a profit for the monopolist of 5000 from sales to households and 16200 from sales to industrial consumers leaving consumers with an aggregate consumer welfare of 0. As can easily be verified, neither the industrial buyers, nor the households would find it interesting to switch either to the alternative rebate scheme or the list price.[51] While the free disposal scenario therefore does not alter the

[49] This is an extension of the theoretical derivations under free disposal that only allowed a rebate scheme with one step, i.e. one rebated price and one corresponding threshold.

[50] In the case of linear demand function and zero cost this will be the respective monopoly prices.

[51] Using Equation 5 above one can easily check that the left hand side under the parameterization used throughout this paper is 0. As a result there is no need to leave any surplus to the industrial

equilibrium prices observed already under the optimal rebate scheme, it doubles the quantities sold. This leads to a complete exhaustion of consumer surplus, effectively doubling producer welfare in contrast to the optimal rebate case and increasing total welfare. As a result, however, both consumer groups are worse off than under the linear counterfactual price but also than under both, the optimal and non–optimal rebate scheme in the absence of free disposal.

Table 1: Summary Information on all 4 cases

	quantities				prices				Consumer surplus			
Consumers	linear price	optimal rebate	non-optimal rebate	rebates free disposal	linear price	optimal rebate	non-optimal rebate	rebates free disposal	linear price	optimal rebate	non-optimal rebate	rebates free disposal
Industrial	419.25	450	417.92	900	19.23	18	19.28	18	3515.21	4050	3493.81	0
Households	80.77	50	72.45	100	19.23	50	27.55	50	3261.90	1250	2624.50	0
Total	500.02	500	490.37	1000	19.23	21.2	20.50	21.2	6777.11	5300	6118.31	0

Table 1 sets out some summary information concerning the three scenarios discussed above and also includes the corresponding values for the free disposal case. Interestingly enough, a comparison of the total quantity sold under the optimal rebate scheme and the linear scheme remains almost identical in contrast with the quantity under the non–optimal rebate scheme that is lower. What can also be observed, as discussed previously, is that while the rebated price is slightly lower, the average weighted price is above the linear price in the optimal rebate scenario and also above the average price under rebates with free disposal. In contrast, both individual and average prices are above the linear price in the non–optimal rebate parameterization. Of interest and substantial importance in an antitrust setting is also the impact on consumer welfare. A comparison of the two scenarios reveals not only that consumer welfare of households declines in the rebate scheme compared to the linear pricing scheme but that even if the assessment of consumer welfare allows for amalgamating the two consumer groups, total consumer surplus is decreasing when the monopolists moves from a linear pricing schedule to a rebate scheme and even drops to zero under free disposal. So while average prices under rebate schemes are never lower than under a linear pricing scheme, overbuying may further harm consumers.

buyers to render them indifferent. Although the theoretical derivation is focusing on the case of only one rebate and not on two rebates, a similar indifference condition will hold for households.

Table 2 furthermore demonstrates that even advocates of a total welfare standard will be disappointed as the optimal rebate scheme not only reduces total consumer welfare but also reduces total welfare with the exception of the rebates under free disposal.[52] Generally speaking rebate schemes primarily increase producer surplus in fulfilment of the condition that profits under the rebate scheme must at least equal the profits under the linear scheme in order to be adopted by the firm. Only under free disposal and a two–step rebate scheme does this increase of producer surplus also result in total welfare being maximized. This maximization, however, comes at the detriment of zero consumer welfare.

Table 2: Consumer, producer and total welfare

	linear price	optimal rebate	non-optimal rebate	rebates + free disposal
Consumer welfare	6777.11	5300.00	6118.31	0
Producer welfare	9615.38	10600.00	10054.78	21200
Total welfare	16392.50	15900.00	16173.10	21200

In contrast to the linear counterfactual price scheme, consumer welfare is lower under both rebate schemes and also under a two–step rebate scheme with free disposal. With the exception of the two–step rebate scheme with free disposal, the same holds for total welfare. Introducing a rebate scheme in the context of the different models discussed above and comparing it to a linear pricing scheme therefore always leads to an increase in produce welfare at the expense of consumer welfare.

4 Conclusion

Based on a simple monopoly model it was demonstrated that the "rebates imply lower prices" nexus often entertained in the literature and used as one of the main arguments in cautioning against competition law intervention in case of retroactive rebates is false. It was shown that (retroactive) rebates do not imply lower prices and references to the penalty price (also known as base or list price) are misleading and cannot be considered an appropriate counterfactual. While a reference to these prices sheds light on the dilemma that buyers face, as they would obviously prefer

[52] For a discussion of different welfare standards in competition law see Elhauge (2009b).

the rebated price over the penalty price, this counterfactual is incapable of properly addressing the question of whether and under what conditions rebate schemes should be sanctioned under competition law. In addition the simple model also demonstrates that consumers may not only be harmed by higher prices but also by what has been termed overbuying.

In the absence of efficiencies directly related to the rebate scheme or (eventual) exclusionary advantages, the choice of firms with market power will not be to offer rebate schemes that reduce (total or average) prices if this decreases profits. In the absence of efficiencies or exclusionary advantages capable of rendering temporary profit sacrifices profitable long term, prices under rebate schemes will never be lower than under the proper counterfactual price scheme. Dominant firms, just as potential smaller rivals, do not hand out free lunches to consumers.

The relevance of an appropriate counterfactual scenario is not only important for an appropriate enforcement of competition law with respect to rebate schemes but naturally extends to the assessment of damage claims as well. Important repercussions for calculating damages arise as prices in the counterfactual without rebate scheme may be lower than under the rebate scheme. This raises the question of what pricing scheme and what exact price should be considered as appropriate counterfactual for calculating damages once abuse has been found.

References

Adam, M. and Maier-Rigaud, F. P. (2009). The law and economics of Article 82 EC and the Commission Guidance Paper on exclusionary conduct. *Journal of Competition Law (ZWeR)*, 1:131–146.

Banasevic, N. and Hellström, P. (2010). When the chips are down: Some reflections on the European Commission's Intel decision. *Journal of European Competition Law & Practice*, 1(4):301–310.

Beckenkamp, M. and Maier-Rigaud, F. (2006). An experimental investigation of Article 82 rebate schemes. *Competition Law Review*, 2(2):1–31.

Bona, J. M. (2010). Loyalty discounts and the FTC's lawsuit against Intel. *The Journal of the Antitrust and Unfair Competition Law Section of the State Bar of California*, 19(1):6–23.

Borlini, L. (2009). Methodological issues of the "more economic approach" to unilateral exclusionary conduct. Proposal of analysis starting from the treatment of retroactive rebates. *European Competition Journal*, 5(2):409–449.

Calzolari, G. and Denicoló, V. (2013). Competition with exclusive contracts and market-share discounts. *American Economic Review*, forthcoming.

Crane, D. A. and Wright, J. D. (2009). Can bundled discounting increase consumer prices without excluding rivals? *Competition Policy International*, 5(2):409–449.

Economides, N. (2009). Loyalty/requirement rebates and the AMC: What is the appropriate liability standard? *Antitrust Bulletin*, 54(2):259–279.

Economides, N. (2012). Tying, bundling, and loyalty/requirement rebates. In Elhauge, E., editor, *Research Handbook on the Economics of Antitrust Law*, chapter 4, pages 121–143. Edward Elgar.

Economides, N. and Lianos, I. (2009). The elusive antitrust standard on bundling in Europe and in the United States in the aftermath of the Microsoft cases. *Antitrust Law Journal*, 76(2):483–567.

Elhauge, E. R. (2009a). How loyalty discounts can perversely discourage discounting. *Journal of Competition Law & Economics*, 5(1):189–231.

Elhauge, E. R. (2009b). Tying, bundled discounts, and the death of the single monopoly profit theory. *Harvard Law Review*, 123(2):397–481.

Elhauge, E. R. and Wickelgren, A. L. (2012a). Anti–competitive market division through loyalty discounts without buyer commitment. Discussion Paper 723, Harvard University. Available at: http://ssrn.com/abstract=2125428.

Elhauge, E. R. and Wickelgren, A. L. (2012b). Robust exclusion through loyalty discounts with buyer commitment. Discussion Paper 722, Harvard University. Available at: http://ssrn.com/abstract=2125398.

European Commission (2005). DG Competition discussion paper on the application of Article 82 of the Treaty to exclusionary abuses. Available at: http://ec.europa.eu/competition/antitrust/art82/discpaper2005.pdf.

European Commission (2009). Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings. *Official Journal of the Commission (OJC)*, 45 (24.2.2009):7–20.

Faella, G. (2008). The antitrust assessment of loyalty discounts and rebates. *Journal of Competition Law and Economics*, 4(2):375–410.

Feess, E. and Wohlschlegel, A. (2010). All-unit discounts and the problem of surplus division. *Review of Industrial Organisation*, 37:161–178.

Geradin, D. (2009). A proposed test for seperating pro-competitive conditional rebates from anti-competitive ones. *World Competition*, 32(1):41–70.

Geradin, D. (2010). The decision of the Commission of 13 may 2009 in the Intel Case: Where is the foreclosure and consumer harm? *Journal of European Competition Law & Practice*, 1(2):112–122.

Greenlee, P. and Reitman, D. (2005). Distinguishing competitive and exclusionary uses of loyalty discounts. *Antitrust Bulletin*, 50(3):441–463.

Greenlee, P., Reitman, D., and Sibley, D. S. (2008). An antitrust analysis of bundled loyalty discounts. *International Journal of Industrial Organization*, 26(5):1132–1152.

Hewitt, G. (2003). Loyalty and fidelity discounts and rebates – Background note. *OECD Journal of Competition Law and Policy*, 5(2):144–180.

Hovenkamp, H. (2006). Discounts and exclusions. *Utah Law Review*, 3:841–861.

Kallaugher, J. and Sher, B. (2004). Rebates Revisited: Anti-Competitive Effects and Exclusionary Abuse Under Article 82. *European Competition Law Review*, 5(5):263–285.

Kjølbye, L. (2010). Rebates under Article 82 EU: Navigating uncertain waters. *European Competition Law Review*, 2:66–80.

Klemperer, P. (1987). The competitiveness of markets with switching costs. *Rand Journal of Economics*, 18(1):138–150.

Kobayashi, B. (2005). The economics of loyalty discounts and antitrust law in the United States. *Competition Policy International*, 1(2):115–148.

Lambert, T. A. (2005). Evaluating bundled discounts. *Minnesota Law Review*, 89(6):1688–1757.

Lande, R. H. (2006). Should predatory pricing rules immunize exclusionary discounts? *Utah Law Review*, 3:863–883.

Lin, J. Y. (1990). The dampening effect of exclusive dealing. *Journal of Industrial Economics*, 39(2):209–223.

Maier-Rigaud, F. P. (2005). Switchings costs in retroactive rebates – What's time got to do with it? *European Competition Law Review*, 26(5):272–276.

Maier-Rigaud, F. P. (2006). Article 82 rebates: Four common fallacies. *European Competition Journal*, 2(2):85–100.

Maier-Rigaud, F. P. and Beckenkamp, M. (2007). Purchase decisions with non–linear pricing options under risk – Experimental evidence. Discussion paper, Preprint Max Planck Institute Bonn.

Maier-Rigaud, F. P. and Schwalbe, U. (2013). Quantification of antitrust damages. In Ashton, D. and Henry, D., editors, *Competition Damages Actions in the EU: Law and Practice*. Edward Elgar.

Maier-Rigaud, F. P. and Vaigauskaite, D. (2006). Prokent/Tomra, a textbook case? Abuse of dominance under perfect information. *EC Competition Policy Newsletter*, 2(2):19–24.

Maskin, E. and Riley, J. (1984). Monopoly with incomplete information. *Rand Journal of Economics*, 15(2):171–196.

Morell, A., Glöckner, A., and Towfigh, E. (2009). Sticky rebates: Rollback rebates induce non–rational loyalty in consumers – Experimental evidence. Discussion paper, Preprint Max Planck Institute Bonn.

Nalebuff, B. (2005). Exclusionary bundling. *Antitrust Bulletin*, 50(3):321–370.

O'Donoghue, R. (2006). Over–regulating lower prices: Time for a rethink on pricing abuses under Article 82 EC. In Ehlermann, C. D. and Atanasiu, I., editors, *European Competition Law Annual 2003 – What is an Abuse of a Dominant Position?*, pages 371–426. Hart.

O'Donoghue, R. and Padilla, A. (2006). *The law and economics of Article 82 EC*. Hart Publishing.

Office of Fair Trading (OFT) (2004). Assessment of conduct. Draft competition law guideline for consultation. OFT 414a. Available at: http://www.oft.gov.uk/shared_oft/-business_leaflets/competition_law/oft414a.pdf.

Office of Fair Trading (OFT) (2005). Selective price cuts and fidelity rebates. Economic discussion paper. Available at: http://www.oft.gov.uk/shared_oft/reports/-comp_policy/oft804.pdf.

Peeperkorn, L. and Rousseva, E. (2011). Article 102 TFEU: Exclusive dealing and rebates. *Journal of European Competition Law & Practice*, 2(1):36–38.

Temple Lang, J. and O'Donoghue, R. (2002). Defining legitimate competition: How to clarify pricing abuses under Article 82 EC. *Fordham International Law Journal*, 26(1):83–162.

U.S. Dep't of Justice (2008). Competition and Monopoly: Single Firm Conduct Under Section 2 of the Sherman Act.

Varney, C. (2009). Vigorous antitrust enforcement in this challenging era. Department of Justice, Speech May 11. Available at: http://www.justice.gov/atr/public/speeches/245777.htm.

Waelbroeck, D. (2005). Michelin II: A per se rule against rebates by dominant companies? *Journal of Competition Law and Economics*, 1(1):149–171.

Wright, J. D. (2013). Simple but Wrong or Complex but More Accurate? The Case for an Exclusive Dealing-Based Approach to Evaluating Loyalty Discounts. Federal Trade Commission, Speech June 3. Available at: http://www.ftc.gov/speeches/wright/130603-bateswhite.pdf.