

The Effect of Buyer Power on ‘Vertical Competition’ and Innovation

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Abstract: We contribute to the ongoing discussion on the implications that the growing consolidation of retailers has on welfare and efficiency in the economy. More specifically, by focusing on the allocation of functions between manufacturers and retailers in the vertical chain, notably the function of innovation, we work out various channels for why the growth of retailers may cause inefficiency by crowding out innovations of branded goods manufacturers. In a model with a single manufacturer and a single retailer, we show how both a ‘hold-up problem’ and a large retailer’s ‘rent appropriation incentives’ can contribute towards an inefficient substitution of manufacturer innovative activity. Furthermore, by allowing for retail competition, we show that these effects may even distort horizontal competition in retailing when, by ‘crowding out’ the innovative activity of branded goods manufacturers, a large retailer gains a competitive advantage vis-à-vis smaller retailers (an innovation ‘waterbed effect’). Moreover, we demonstrate how the threat of imitation of manufacturers’ innovation by large retailers with private labels can aggravate these inefficiencies and the resulting harm to competition. What is key for this potential inefficiency to arise is retailers’ ability to control manufacturers’ access to consumers, in particular when they can act as ‘gatekeepers’.

Keywords: buyer power, hold-up, innovation, private labels, vertical competition, waterbed effect

JEL Codes: K21, L14, L42, L81, O31

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I. INTRODUCTION

Traditional economic analysis, as presented by standard economic textbooks, often completely ignores distribution and retailing activities. Firms are treated as if they compete directly for the patronage of final consumers or as if they were selling through a retailing industry that, possibly due to perfect competition, represents just a ‘transparent window’ to the market place.¹ Furthermore, when retailing and the role of vertical relationships are considered, more often than not the picture is that of manufacturers confronting retailers with ‘take-it-or-leave-it’ offers and managing channels through the judicious use of wholesale contracts that target a particular retail price. However, this picture bears little resemblance to the real world in many industries, which is of concern because competition policy in Europe is increasingly informed by economics.

Large retailers have gained impressive buyer power through organic growth and mergers. This increase has been helped by a change in shopping habits, such as a trend towards one-stop shopping favouring large retail outlets and reducing consumers’ loyalty towards brands, as well as retailers’ own increasingly global procurement strategies. In addition, the advent of private labels has resulted in retailers directly competing with manufacturers in certain product segments as they move their private labels upmarket.

The shift of power and functions to retailers may often be attributable to more fundamental changes, such as changes in shopping habits or technology that, for instance, may render it more efficient if retailers take on a larger role in distribution. The growth and exercise of buyer power, especially when due to consolidation in the retailing industry, may, however, negatively affect not only horizontal competition but also the efficient allocation of roles and

¹ Cf, for instance, the discussion in Inderst, R., and N. Mazzarotto. 2008. Buyer Power in Distribution. In ABA Antitrust Section Handbook, Issues in Competition Law and Policy, edited by William Collins, American Bar Association, Chicago.

functions in the vertical relationship. Which functions (such as those of innovation, distribution or marketing) are performed (more) by retailers or by manufacturers is then possibly not only determined by efficiency considerations, but also the result of the exercise of buyer power and can even become a strategic tool aimed at increasing future (bargaining) power.

These possibilities have not yet been acknowledged sufficiently, either among scholars or among practitioners of competition law and policy. One objective of this study is, consequently, to broaden the discussion on manufacturer–retailer relationships and, notably, on the exercise of buyer power in this direction – that is, towards an inclusion of the perspective of ‘vertical competition’ over functions. We provide both stylised evidence of such competition and, in some cases, of a pronounced shift of functions away from manufacturers and towards retailers, as well as a formal economic analysis that addresses the issues of efficiency and welfare. Motivated by developments in the private label segment of food retailing, we ask, in particular, whether one can expect that, as retailer size and buyer power grow, the function of *innovation* to be allocated efficiently between manufacturers and retailers. The formal analysis isolates various forces for why, with the growth of large retailers, manufacturers’ innovation could be inefficiently ‘crowded out.’

The formal analysis of innovation incentives in this report highlights only one possible area where retailer consolidation and the exercise of buyer power can lead to an inefficient shift of functions. The results should inform competition policy, which has indeed become increasingly concerned about the impact of consolidation in the retailing industry and the exercise of buyer power. Broadly speaking, one also needs to address how such consolidation and the exercise of buyer power *inefficiently* tilt the balance in the vertical competition for functions.

To isolate the different forces that are at work, the analysis proceeds in two steps. In the first step the analysis abstracts from retail competition. In the second step retail competition is introduced. In the absence of retail competition, the focus is on the ‘gatekeeping’ function that a retailer occupies with respect to consumers. That is, while the retailer always has access to consumers, irrespective of whether it sells a branded product or a private label product, the brand manufacturer relies on the retailer’s patronage. The formal analysis shows that this can give rise to an inefficient shift of innovative activity away from brand manufacturers to the retailer (and its private label products) as a retailer sufficiently gains in size. The first reason for this is a hold-up problem, which undermines the manufacturer’s return from an innovation. This is potentially seriously aggravated when the retailer can also threaten with imitation of a brand manufacturer’s innovation. The second reason is a ‘rent-appropriation’ motive of the retailer: the retailer’s control of final consumers puts it in a position to extract a larger share of total profits when it innovates through the private label product, instead of relying on the brand manufacturer. In the latter case, in particular, the shift of innovative activity towards the retailer is thus not driven by an efficiency rationale, but only by the retailer’s motive to appropriate a larger share of total industry profits. Overall, the analysis shows how there can be a ‘crowding-out’ of manufacturer innovative activity even when the retailer’s innovation costs are higher than those of a brand manufacturer.

Such a ‘crowding-out’ can become more severe when there is retail competition. The formal analysis considers here a setting where a large retailer competes with smaller retailers in different local markets. We show that there are now two different inefficiencies that can arise, in addition to the two forces that are isolated already without competition. When investment costs are not too large, there can be inefficient duplication, as an innovation is made both by the large retailer and the brand manufacturer. More seriously from a competition perspective is the second inefficiency. There, only the large retailer invests, while the absence of an innovation

by the brand manufacturer now deprives smaller retailers of an equally competitive product. We call this a ‘waterbed effect’ that harms smaller retailers once the activity of a large retailer crowds out manufacturer innovation. When it dampens or even replaces manufacturer innovation, a large retailer’s own innovative activity reduces smaller retailers’ access to innovation and puts them at a competitive disadvantage.

Taken together, the formal analysis thus isolates various reasons for why consolidation in the retailing industry and the (further) growth of a large retailer can inefficiently tilt innovative activity towards large retailers, thereby even ‘crowding out’ the innovative activity of brand manufacturers. More generally, though competition policy has already become increasingly concerned about the exercise of buyer power, our analysis shows that consolidation in the retailing industry and the exercise of buyer power by large retailers, together with the increasing importance of private labels, may have detrimental effects on welfare and competition that hitherto have been overlooked. As noted previously, retailers’ control of final consumers is a key facilitator for this.

This article is structured as follows. Section II documents a shift in power towards retailers. Next, section III illustrates how –in particular large and powerful– retailers have increasingly taken over functions in the vertical relationship, notably – though not exclusively – through their private labels. Based on this background of increasing consolidation and buyer power as well as the rise of private labels, Section IV provides an economic analysis of the allocation of innovative activities between manufacturers and large retailers. Section V concludes and summarizes results from this study.

II. BUYER POWER IN RETAILING

Sources of Buyer Power

We refer to buyer power very broadly as the bargaining strength that a buyer has with respect to the suppliers with whom it trades.² For the presentation of a simple framework, we consider the bilateral negotiations between a buyer (henceforth called A) and a seller (henceforth called B). We assume that they can jointly realise profits of z . How these profits are shared should depend most on what each of the two parties could realise even without its counterparty. That is, the buyer (retailer) could delist the respective product and negotiate with another seller and the seller (manufacturer) could instead turn to different distribution channels. We denote the profits from these alternatives (typically called outside options) by v_A and v_B respectively. In what follows, we introduce and discuss several determinants of buyer power from the perspective of these outside options, thereby asking, for instance, how a retailer's size makes its own outside options more valuable and possibly those of a manufacturer less valuable. The same reasoning applies with respect to private labels.

Before we continue with the formal analysis, note that the 'net surplus' that is realised from successful negotiations is the difference $z - v_A - v_B$. This difference is what is essentially on the table when the two parties A and B negotiate. If this amount is shared equally, A realises the sum of its outside option v_A plus one-half of the net surplus $z - v_A - v_B$, while party B realises the sum of its outside option v_B plus, again, one-half of $z - v_A - v_B$. In what follows, we discuss

² This is not the only way in which competition economics has looked at buyer power. In fact, the textbook view of buyer power (known as monopsony power) is also different: It presumes that upstream and downstream firms interact in a market. In the simplest case, buyer power then represents the perfect mirror image of seller power: Just as sellers can raise prices by withholding supply, buyers can reduce (wholesale) prices by withholding demand. However, such exercise of buyer power rests on the following assumptions: Purchasing larger quantities increases market price (eg, since increasing marginal costs imply an upward-sloping supply curve) and there is no scope for an individual buyer to exert power by obtaining a specific discount. This situation implies, in particular, that withholding demand also benefits other buyers. However, we do not find this perspective on buyer power appropriate for the present analysis. Instead, the textbook view is more appropriate for competitive commodity markets, where the assumption of a uniform trading price may be justified.

some determinants of buyer power with regard to their effects on the respective outside options, notably, retailers' size and their 'gatekeeping role' and private labels. At this point we report, however, only the basic arguments and relate them more broadly to the literature. In the following section we discuss in detail the respective developments in European food retailing.

As discussed in the next section, in some sectors, such as food retailing, retailers have grown in size, both organically and through domestic and international mergers and acquisitions. Size may increase a retailer's buyer power by raising the value of its own outside options in a variety of ways.

First, if a buyer is large enough, it can credibly threaten to incur even substantial costs and integrate backwards, thereby rendering the supplier redundant.³ We later use precisely this possibility to relate size to the threat of imitating a brand manufacturer's innovation. Size may also determine how credibly a buyer may threaten to switch to another supplier, where switching involves non-negligible one-off costs. In addition, size may make a buyer more knowledgeable about alternative sources of supply, as it makes it profitable to have a more professional purchasing process for even relatively narrow product categories.⁴ For all of these reasons, size may confer buyer power by increasing the value of the outside options that are available to the buyer. The resulting discounts and other improvements of terms and conditions will then exceed those that would be justified solely on the basis of improved efficiencies (eg, from handling a larger buyer's volume).

Empirical research largely confirms the role of size as a determinant of discounts. Several studies, particularly among the earlier literature on buyer power, find a negative relation

³ This argument is formalised in Katz, M.L., 1987. The Welfare Effects of Third Degree Price Discrimination in Intermediate Goods Markets. *Am Econ Rev*, 77: 154–167 and Sheffman, D.T., and P.T. Spiller, 1992. Buyers' Strategies, Entry Barriers, and Competition. *Econ Inquiry*, 30: 418–436.

⁴ The importance of 'buyer sophistication', which often grows with size, is outlined in more detail in Nordemann, J., 1995. Buying Power and Sophisticated Buyers in Merger Control Law: The Need for a More Sophisticated Approach. *Eur Comp L Rev*, 5: 270–281 and Steptoe, M., 1993. The Power-Buyer Defense in Merger Cases. *Antitrust L J*, 61: 493–505. In addition, larger buyers may employ more competitive procurement methods, such as auctions.

between buyer concentration and suppliers' profit margins.⁵ More recently, event-based studies in the financial economics literature show that, generally, buyer mergers have a negative impact on suppliers' profits.⁶ Interesting evidence also appears in the findings of the United Kingdom's repeated inquiries into the national food (grocery) retail market, which, for instance, revealed a widening differential in purchasing conditions in the course of only a few years.⁷ This issue is discussed in the next section.

Size may not only increase the value of the buyer's outside options, but also reduce the value of the seller's outside options. A manufacturer losing a large contract and thus having to search for alternative distribution channels for a large fraction of total output or capacity may severely reduce the price and thus the profit that the seller can still realise.⁸ This situation may particularly apply when a retailer acts as a gatekeeper in a given (local) market. If a retailer faces little or no competition in a given (local) market, a supplier has no alternative channels to serve those consumers. Thus, sales made through such a retailer may be more difficult to replace than those made through a retailer in a highly competitive market.⁹ The impact of such gatekeeping on innovation activity is analysed formally in Section IV.

⁵ Lustgarten, S.H., 1975. The Impact of Buyer Power in Manufacturing Industries. *Rev Econ and Stat*, 75: 125–132 and Schumacher, U., 1991. Buyer Structure and Seller Performance in US Manufacturing Industries. *Rev Econ and Stat*, 73: 277–284 are representative studies. Note, however, that size and market concentration are not always fully interchangeable.

⁶ Cf Bhattacharyya, S., and A. Nain, 2006. Horizontal Acquisitions and Buying Power: A Product Market Analysis, mimeo. Fee, C.E., and J. Thomas, 2004. Sources of Gains in Horizontal Takeovers: Evidence from Customer, Supplier, and Rival Firms. *J Fin Econ*, 74: 423–460 show how these effects due to buying power are more pronounced if the downstream industry is already relatively concentrated.

⁷ When reviewing the prices paid for the top five branded lines of 26 large suppliers, the five largest multiples bought goods more cheaply than any other party (Competition Commission (UK), 2000. *Supermarkets: A Report on the Supply of Groceries from Multiple Stores in the United Kingdom*, Competition Commission, London). These findings were broadly confirmed in an assessment of a proposed merger in 2003 (Competition Commission (UK), 2003. *Safeway plc and ASDA Group Limited (Owned by Wal-Mart Stores Inc); Wm Morrison Supermarkets plc; J. Sainsbury plc; and Tesco plc: A Report on the Mergers in Contemplation*, Competition Commission, London).

⁸ Cf Inderst, R., and Wey, C., 2004, The Incentives for Takeover in Oligopoly. *Int J Indus Org*, 22: 1067–1089. The various inquiries by the UK's Competition Commission showed that even nationwide brands are often highly dependent on a few retail chains. For instance, on average three-quarters of sales of even large suppliers went through only three retailers (Competition Commission (fn 7)).

⁹ For the role of gatekeepers cf, for instance, Mazzarotto, N., 2003. *Retail Mergers and Buyer Power*, mimeo, Dobson, P., and M. Waterson, 1997. Countervailing Power and Consumer Prices. *Econ J*, 107: 418–430, and von Ungern-Sternberg, T., 1996. *Countervailing Power Revisited*. *Intl J Indus Org*, 14: 507–519. Moreover, the immediate loss of profits may be aggravated if a supplier is particularly dependent on a retailer. For instance, if the supplier has high financial commitments and no/insufficient access to credit facilities, losing a substantial fraction of its business (particularly on short notice) may cause it financial distress. Any 'threshold' value of lost business or profits that would trigger such financial distress should depend, among other things, on the supplier's financial condition and potential to flexibly scale down business or find alternative sales channels.

A final important determinant of buyer power in retailing is the use of private labels. These not only allow retailers to directly control a larger fraction of their total business, but also enhance their bargaining position vis-à-vis branded goods manufacturers. We explore private labels in more detail in Section III.

Buyer Power in European Retailing

While concentration among retailers varies from industry to industry and from country to country, various sources agree that food retailing has become increasingly concentrated in most European countries. This is particularly due to a wave of mergers and acquisitions.¹⁰ In addition, buying groups (coalitions of retailers formed to secure more weight and scale in procurement negotiations) have grown in size. For illustrative purposes, Table 1 shows the evolution of the food retailing market shares of the top five firms (five-firm concentration ratio or CR5) in the five major markets of the European Union from 2005 to 2010. All but one market show a considerable increase in concentration based on this measure.¹¹

Table 1. Concentration in European food retail markets in 2005 and 2010 (top 5, as percentages).¹²

	Five-firm concentration ratio (in %)	
	2005	2010
France	73.0	73.0
Germany	61.0	75.0
Italy	28.0	32.0
Spain	57.0	64.0
UK	69.0	74.0

¹⁰ Cf Clarke, R., M. and others, 2002. *Buyer Power and Competition in European Food Retailing*. Edward Elgar Publishing, Cheltenham, Table 7.8.

¹¹ European Commission, 2011. *The Impact of Private Labels on the Competitiveness of the European Food Supply Chain*, European Commission, Brussels, Chapter 5 and the Organisation for Economic Co-operation and Development, 2006. *Resale Below Cost Laws and Regulation*, Organisation for Economic Co-operation and Development, Paris, Chapter 1 provide more details on the growth of buyer power in European food retail across different countries.

¹² Data from Europanel. Source: British Brands Group, 2012. *Buyer Power Continued*.

Figure 1 shows the development of the market shares (as well as prospective growth) of the five leading full-range food retailers in Germany since 1995 in more detail.

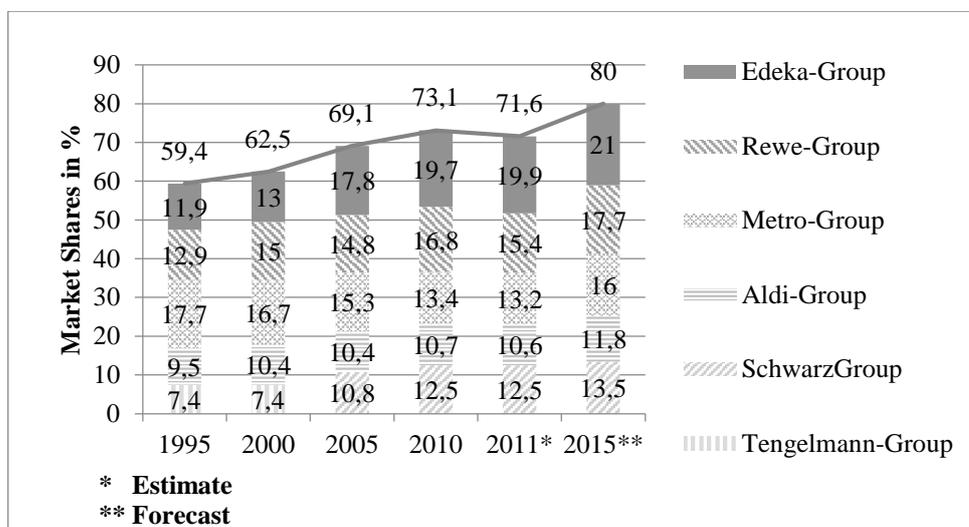


Figure 1. Development of market shares in the German food retail market from 1995 to 2015¹³

The solid line in Figure 1 represents the combined market share of the top five retailers. According to the data used here, the top five retailers in 1995 (EDEKA, Rewe, Metro, Aldi, and Tengelmann) accounted for around 60 per cent of total sales.¹⁴ By 2010, the combined market share of the top five retailers had grown to approximately 73 per cent.

The growing concentration directly affects the importance of individual retailers for manufacturers. More than 10 years ago already, British food suppliers sold, on average, one-third of their UK sales to the biggest British customer and nearly 70 per cent to their top five customers.¹⁵ A survey of German brand suppliers suggests that, on average, German food

¹³ Data from Nielsen Trade Dimensions. Source: Monopolkommission, 2010. Jahresgutachten, Monopolkommission, 2011. Jahresgutachten. Note: Differences in data sources account for the slightly different market share figures throughout this article. While other sources even suggest that concentration is still higher, for the present argument such details are not key, as all sources and study suggest both a high level of concentration and notably a considerable increase over the last decade.

¹⁴ From 2005, the composition of the five leading trading companies changed (with Tengelmann replaced by the Schwarz Group, which operates the Lidl discount stores and Kaufland hypermarkets and supermarkets).

¹⁵ Cf Competition Commission (fn 7).

suppliers sell 27 per cent to the largest German customer and around 60 per cent to their top three customers.¹⁶

Further evidence on the exercise of buyer power comes from the UK Competition Commission's Supermarkets reports.¹⁷ For instance, reviewing the prices paid for the top five branded lines of 26 large suppliers, the UK Competition Commission found that the top five retailers with the largest market share paid significantly lower prices than other retailers. It also ascertained, more generally, a substantial volume-related discount.¹⁸ Further survey evidence on the buyer power of retailers is provided by a German study conducted in 2009. There, for instance, 90 per cent of respondents reported earning their lowest margin with one of their three largest customers.¹⁹

The exercise of buyer power is, however, not limited to securing price concessions, but can be directed towards more favourable non-price terms as well.²⁰ Such additional non-price terms may comprise lump sum payments (eg, to initiate or continue trading with the buyer) or listing fees and slotting allowances, but could also include non-financial benefits (including exclusive arrangements).²¹ Again, the aforementioned reports of the UK Competition Commission provide evidence on the extent to which large and strong buyers employ such

¹⁶ Cf DIW (Deutsches Institut für Wirtschaftsforschung), 2010. Zunehmende Nachfragemacht des Einzelhandels: Eine Studie Für den Markenverband and Von Schlippenbach, V., and F. Pavel, 2011. Konzentration im Lebensmitteleinzelhandel: Hersteller Sitzen am kürzeren Hebel. DIW Wochenbericht. The numbers for Dutch suppliers, as another example, are comparable (cf Landbouw-Economisch Instituut, 2009. Prijsvorming van Voedingsproducten).

¹⁷ Cf the Competition Commission (fn 7) and Competition Commission (UK), 2008. The Supply of Groceries in the UK. Market Investigation, Final Report, Competition Commission, London. Cf also Dobson, P., 2005. Exploiting Buyer Power: Lessons from the British Grocery Trade. *Antitrust L J*, 2: 529–562 and the European Commission (fn 11) for further discussions of the results for retailer buyer power in the British food industry.

¹⁸ For example, expressed in terms of comparisons to the price paid by Tesco, it was found in 2000 that a number of smaller chains paid around 10 per cent more. The Groceries Market Investigation, which was concluded in 2008, revealed a statistically significant relation between price and volume purchased. The difference between the volume purchased by a very small customer and that purchased by a very large customer would result, according to these estimates, in a price differential of more than 10 per cent, which may be the outcome of the exercise of buyer power (and thus go beyond any efficiencies that arise from volume purchases).

¹⁹ Cf DIW (fn 16) and von Schlippenbach and Pavel (fn 16).

²⁰ Dobson (fn 17) and the European Commission (fn 11) provide a review of the relevant non-price terms.

²¹ Other arrangements that powerful buyers may enforce include shifting the burden of risk (eg, from returns) and the provision of liquidity (through late payments) to suppliers.

practices.²² As summarised in Table 2, the Competition Commission finds evidence that various practices (grouped here into eight categories) were applied by the major retailers.²³

Table 2. Assessment of UK supermarket practices concerning relations with suppliers in 2000.²⁴

Category of practices	No. of practices	No. of retailers engaging in practices (min - max)
Payments for access to shelf space	8	5–13
Imposing conditions on suppliers' trade with other retailers	2	1–4
Applying different standards to different suppliers	1	3
Imposing an unfair imbalance of risk	12	1–12
Imposing retrospective changes to contractual terms	8	1–7
Restricting suppliers' access to the market	1	10
Imposing charges and transferring costs to suppliers	8	2–13
Requiring suppliers to use third-party suppliers nominated by the retailer	2	2–11

Such practices and, in particular, their use by large and powerful retailers are also documented for Germany by the aforementioned survey. Accordingly and as summarised in Table 3, around three-quarters of the suppliers interviewed for this survey mentioned that at least one of their three largest trading partners had demanded retroactive discounts over the last five years.²⁵ Tellingly, the likelihood that a retailer demanded such a retroactive discount increased significantly with its importance for the supplier.²⁶

²² In total, the Competition Commission identified 52 practices associated with retailer buyer power that were employed by the major food retailers and that were thought to potentially distort competition.

²³ In addition, in its 2008 inquiry, the Competition Commission concluded that nearly half of the observed non-price retailer buyer practices concerned the transfer of risks and unexpected costs. Furthermore, when measured by complaints received, retrospective payments were particularly widespread in this category.

²⁴ Source: Dobson (fn 17), adapted from the Competition Commission (fn 7).

²⁵ Cf DIW (fn 16) and von Schlippenbach and Pavel (fn 16).

²⁶ Czibik, A., and A. Mako, 2008. Relationship of Large Retail Chains and Their Suppliers: A Causal Analysis – Study Made on Behalf of the Hungarian Competition Authority. MKIK Gazdaság- és Vállalkozáselemző Intézet also find for the Hungarian retail market that larger retailers demand larger refunds.

Table 3. Assessment of German retailer practices in 2009.²⁷

Category of practice	Frequently	Rarely or never	Prefer not to say
Demand for retroactive discounts	74%	24%	2%
Problem with regular retrospective payments	54%	46%	0%
Cancellation of planned promotion	39%	61%	0%
Delisting of products	30%	70%	0%

The preceding account of the growing buyer power in European food retailing and of its exercise vis-à-vis manufacturers is surely far from complete. Its main purpose is to provide a background for our further analysis. It is therefore useful to summarise the following key observations. Though differences between national markets exist and persist, overall there has been a marked consolidation in the retailing industry. This has led, in particular, to the rise of several very large retailers that are also active across different European countries and even worldwide. While consolidation may have reduced horizontal competition, we abstract from this and focus instead on the vertical dimension. Various studies suggest the increasing exercise of buyer power by these large retailers. In what follows, we make first some additional observations to complement this picture. Notably, we turn to the question of how functions have shifted increasingly to retailers, particularly through their increase in size. We further give more details on private labels, which both provide evidence of this shift in functions and represent another, particularly important lever of buyer power. The final formal analysis brings this all together by working out how the function of innovation may inefficiently switch to retailers and their private label products through an increase of size (and the exercise of size-related buyer power, more generally).

²⁷ Supplier complaints (as a percentage) regarding practices by at least one of their three largest trading partners over the last five years. Source: DIW (fn 16).

III. 'VERTICAL COMPETITION' OVER FUNCTIONS IN THE VERTICAL CHAIN: SOME BACKGROUND

A General Shift in Functions

Economists traditionally view retailers, if considered at all in their analyses,²⁸ as agents that bridge the distance between manufacturers and consumers, in both time and space. They offer products in stores that are closer to consumers than, say, the manufacturers' plants.²⁹ But they do much more and increasingly so, as has been duly recognised by business scholars. This fact needs to be equally recognised in the economics literature, which underlies much of today's thinking about competition policy and antitrust.

While retailers still carry out the final step in the distribution of merchandise and are still primarily engaged in the activity of purchasing products from other firms to resell those goods to consumers, such a description disguises the increasing role that retailers play across all functions. For instance, through their private labels they engage in product innovation or they build up their own (umbrella) branding to act as a certifier for quality, thereby increasingly taking over functions that were previously performed exclusively by brand manufacturers. Furthermore, retailers often take over an increasing part of distribution: Where manufacturers previously delivered right to individual stores and possibly even controlled the display of their products, large retailers may now collect shipments directly at the factory gates.

²⁸ In much of the analysis in economic textbooks, retailing rarely plays a role, very much in contrast to the marketing literature, where channel management and control are a key issue. This neglect in economics is, for instance, reflected in the fact that the distribution of power between retailers and manufacturers is usually not considered at all. In fact, economic models of vertical relationships typically assume that manufacturers (or often a single monopolistic manufacturer) can make take-it-or-leave-it offers to downstream firms.

²⁹ They thereby provide consumers with an appropriate assortment of different products, thus offering breadth and variety, and also reduce lot sizes to quantities (packages) suitable for consumers. The various traditional roles have been covered extensively in the business literature. Cf the overviews in Coughlan and others, 2008. *Marketing Channels*, 7th ed., Prentice-Hall, Upper Saddle River, NJ or Van Watershoot, S.W., and others 2010. *The Classic Conceptualisation and Classification of Distribution Service Outputs – Time for a Revision?* *Eur Retail Research*, 24(2): 1–32.

Apart from changes in technology or consumer shopping habits, this development is undoubtedly also being driven by the increasing size of retailers. Large-scale retail chains have developed across all countries and have taken market share from small, previously independently owned shops. Chains and buyer groups are no longer only regional or national but increasingly international, sometimes employing far more people than manufacturing companies and operating thousands of stores worldwide. In addition to being leading players in the distribution channel, large retailers are ready to assume marketing and logistics leadership in their vertical relationship with manufacturers.³⁰

Clearly, the reality in most markets no longer conforms to the classical segmentation of manufacturers, wholesalers, and retailers when it comes to the role they play in the distribution of products. Instead, many different forms of how products are stocked and shipped have developed and often co-exist. They differ with respect to who takes ownership of products and when, who is responsible for keeping inventory, or when and how new orders are elicited. In addition, there are various ways in which retailers and manufacturers cooperate with the use of modern IT solutions or in which a retailer uses a particular manufacturer to help coordinate and manage a whole category. That said, there is a strong tendency, especially in food retailing, for larger retailers to increasingly take over a larger share of these functions.³¹

Until the 1980s it was common practice for manufacturers to deliver products directly to the individual stores.³² Arguably many of the changes that have resulted since then may have been largely driven by the realisation of efficiency gains as retailers grew in size, such as in the form of economies of scale or economies of density. Retailers have gradually moved towards

³⁰ These shifts are covered broadly in textbooks on retail management and marketing (eg, Zentes, J., and others, 2011. *Strategic Retail Management*, 2nd edition. Gabler Verlag, Springer Fachmedien, Wiesbaden).

³¹ The distribution of functions has notably developed quite differently across sectors, for example, with the rise of manufacturer-owned or dedicated outlets in the clothing sector.

³² Cf, for instance, Mercer, A., 1993. The Consequences for Manufacturers of Changes in Retail Distribution. *Eur J Operational Research*, 64 (3): 457–461.

central warehousing, so that manufacturers now usually deliver to a retailer distribution centre,³³ from which retailers can then supply their stores more efficiently.³⁴ Despite the aforementioned variety of different concepts of distribution and inventory management, there is still a tendency towards further ‘backwards integration’ (eg, with retailers collecting goods directly from suppliers rather than relying on supplier delivery³⁵). While this short description cannot do justice in describing the whole process of shifts in functions and roles, which clearly varies considerably between sectors and across national markets, it is important for competition analysis and antitrust to recognise the key shifts.

The Rise and Changing Role of Private Labels

The market share of private labels in European food retailing has risen significantly, albeit with considerable national differences. For instance, based on sales volume in 2011, private labels accounted for 10 per cent in Greece, against 42 per cent in the United Kingdom.³⁶ As for growth, from 2003 to 2009 this share increased by two to seven percentage points in Western and Southern Europe (except Spain) and by 10 to 26 percentage points in Spain and Central Europe.³⁷

³³ In particular, very large retailers with a high density of stores may then use centrally located distribution centres. Such economies of density have been described for Wal-Mart in Holmes, T., 2011. *The Diffusion of Wal-Mart and Economies of Density*. *Econometrica*, 79(1): 253–302. For the United Kingdom, cf Fernie, J., F. Pfab, and C. Marchant, 2000. *Retail Grocery Logistics in the UK*. *Intl J Logistics Management*, 11(2): 83–90 and Competition Commission (fn 17).

³⁴ Cf, for instance, Le Blanc, H.M., F. Crijssen, H.A. Fleuren, and M.B.M. de Koster, 2006. *Factory Gate Pricing: An Analysis of the Dutch Retail Distribution*. *Eur J Operational Research*, 174(3): 1950–1967. A retailer distribution centre receives incoming orders from manufacturers and redistributes them to individual stores (Buzzell, R.D., and G. Ortmeyer, 1995. *Channel Partnerships Streamline Distribution*. *Sloan Management Rev*, 36(3): 85–96). Benefits may include shorter lead times, inventory reduction (backroom stock centralised in retailer distribution centres), or the general streamlining of administrative processes (eg, McKinnon, A., 1990. *The Advantages and Disadvantages of Centralised Distribution*. In *Retail Distribution Management*, edited by John Fernie, Kogan, London, pp. 75–89, Voss, M.D. and others, 2005. *Internal Service Quality: Determinants of Distribution Center Performance*. *Intl J Physical Distribution & Logistics Management*, 35(3): 161–176, Yang, L., C.T. Ng, and T.C.E. Cheng. 2010. *Evaluating the Effects of Distribution Centres on the Performance of Vendor-Managed Inventory Systems*. *Eur J Operational Research*, 201(1): 112–122).

³⁵ In this respect, the practice of factory-gate pricing is worth noting, where retailers essentially buy products directly at the factory gate and take care of further distribution. The respective ‘value added’ is then created entirely by the retailer (le Blanc (fn 34)).

³⁶ Source: Metro-Group – *Metro Handelslexikon* (2012/2013, p. 61). Unless stated otherwise, here and in the following, market shares are calculated based on the turnover of fast-moving consumer goods, excluding fresh food.

³⁷ European Commission (fn 11).

Furthermore, in Germany private label penetration is particularly strong in Germany, where it has almost doubled between 2000 and 2012, from 21.8 per cent to 39.8 per cent.³⁸ In addition, some retailers and retailer formats have a particularly high share of private labels. This is particularly true for ‘hard discounters’ such as Aldi, which in 2010 reportedly had a private label share of total turnover of more than 90 per cent.³⁹ This is particularly important, since such hard discounters have gained market share over the last decade and now account for a substantial share of the overall retail market in Germany. However, the perception that private labels are predominantly associated with discounters or, at least, with lower-value (‘budget’) products may be highly misleading in light of recent developments, such as a shift towards higher-value products and, notably, the use of private labels by supermarkets (rather than discounters). Thus, as discussed next, retailers increasingly compete head-on with branded goods manufacturers. The possible implications for innovation are the focus of the formal analysis in Section IV.

During the 1980s and 1990s, private labels were almost exclusively of the budget type. From the retailers’ perspective, cost savings in production, distribution, and marketing were originally seen as the primary motivation for the introduction of private labels.⁴⁰ These budget private labels were positioned at the lower end of the quality and price range.⁴¹ Characteristic of this low-price, low-quality strategy are so-called ‘me too’ products, positioned closely to

³⁸ The figure for 2000 is based on GfK data and reported in Wey, C., 2011. *Nachfragemacht im Handel. Ordnungspolitische Perspektiven*, 21. Furthermore, *Lebensmittel Zeitung*, 3 May 2013. *Lebensmittel Zeitung* 18: 42, based on Nielsen data, reports an increase in the share of private labels from 36.2 per cent in 2006 to 38.8 per cent in 2012 for German food retailers of more than 100 m².

³⁹ Cf Monopolkommission (fn 13).

⁴⁰ Cost savings could be so substantial that private labels, although sold at a lower price, still generated higher profit margins than the respective national brands. With data from this early stage of private label products, Hoch, S.J., and S. Banerji, 1993. *When Do Private Labels Succeed?* *Sloan Management Rev*, 34: 57–67, for instance, report that retailer gross margins on private labels are 20–30 per cent higher than on national brands. The question of private labels also relates somewhat to that of vertical integration, which has been discussed extensively in the economics literature. The possible efficiency gains of such vertical integration may relate to a reduction of transaction cost (Williamson, O.E., 1971. *The Vertical Integration of Production: Market Failure Considerations*. *Am Econ Rev*, 61: 112–123) or a reduction of ‘double marginalisation’ (Spengler, J.J., 1950. *Vertical Integration and Antitrust Policy*. *J Pol Econ*, 58(4): 347–352).

⁴¹ For supermarkets in particular, private labels were initially part of a low-price, low-quality strategy allowing retailers to compete with discounters for the low-income and price-sensitive buyer segment (Hassan, D., and S. Monier-Dilhan, 2006. *National Brands and Store Brands: Competition through Public Quality Labels*. *Agribusiness*, 22: 21–30).

established national brands.⁴² Private labels were then especially successful in markets where no strong national brands were present and, at this stage, private label products could basically only replace products with a weak ‘brand image’ (or, at most, national B-brands).⁴³ However, over recent years in particular, private labels have grown in the segment of added-value and ‘premium’ products. In Germany, for instance, the market share of ‘premium’ private labels has grown from 9.0% in 2007 to 12.9% in 2012 while the market share of national B-brands dropped from 37.1% to 33.6% over the same period.⁴⁴ Moreover, in some segments, such as organic food and beverages, the private label share is already greater than that of national brands.⁴⁵

Retailers were quick to introduce their own private label product lines, thereby capturing this segment to a large extent.⁴⁶ They are also increasingly doing so by means of their reputation and image, which they are building up steadily. Thus, important functions such as marketing or the certification of quality, for which the store image is now essential, are shifting away from the supplier and to the retailer.⁴⁷ In particular, a novel dimension of this development is that, increasingly, supermarkets are no longer advertising based on promotions, but – just like brand

⁴² Sometimes retailers chose similar-sounding names and package designs to piggyback onto the respective national brand’s reputation (Kumar, N., and J.B.E.M. Steenkamp, 2007. *Private Label Strategy, How to Meet the Store Brand Challenge*. Harvard Business School Press, Boston, MA).

⁴³ Originally they were successful for products where consumers required less trust, since they can immediately inspect quality or there is little risk of disappointment. According to European Commission’s (fn 11), this applies, for instance, to plastics and wrapping products. The market share of private labels is also high for frozen and deli products, followed by dairy and dry groceries (European Commission (fn 11)). For other product categories, such as personal care, cosmetics, and baby food, the share of private labels is particularly low. For these products, consumers perceive the risk of being disappointed by a new product as more severe and thus tend to rely on the reputation for quality that could initially be provided only by an established national brand (GfK, 2010. *Eine Frage des Vertrauens*. Compact Info Service des GfK Vereins, GfK).

⁴⁴ Source: GfK, 2013b. *ConsumerScan*.

⁴⁵ The rise of organic private labels or, more generally, that of private labels in the ‘ethical food’ segment, has also been documented elsewhere (Daskalova, V.I., 2012. *Private Labels (Own Brands) in the Grocery Sector: Competition Concerns and Treatment in EU Competition Law*, Tilburg Law and Economics Center Discussion Paper, DP 2012-002., with examples).

⁴⁶ Manufacturers with a strong brand also struggle with the problem that an ‘organic variant’ will either dilute the respective brand image or only be perceived as a ‘marketing campaign’ (GfK, 2013a. *Markenführung 2.0 – Die neue Architektur der Märkte*; 32, *Unternehmergespräch*, 2013, GfK).

⁴⁷ Because a retailer can introduce a premium private label across different product categories throughout its assortment, private label products can serve as a ‘reliability umbrella’ (Ezrachi, A., and J. Reynolds, 2009. *Advertising Promotional Campaigns, and Private Labels*. In *Private Labels, Brands, and Competition Policy. The Changing Landscape of Retail Competition*, edited by Ariel Ezrachi and Ulf Bernitz, Oxford University Press, New York, pp. 259–279). Cf also Marvel, H.P., and S. McCafferty, 1984. *Resale Price Maintenance and Quality Certification*. *RAND J Econ*, 15(3): 346–359 for a theoretical consideration.

manufacturers – are building an image of their own. Apart from again shifting the power balance towards retailers, especially since that should increase store loyalty relative to brand loyalty, this development also provides retailers with a platform to quickly react to changes in consumer behaviour and tastes with their own private label products.⁴⁸

We do not intend to review comprehensively the potential benefits and drawbacks of the growth of private label products and the various strategic rationales.⁴⁹ The realisation of cost efficiencies and their use for aggressive price competition, for instance, may benefit consumers. To the extent that they are, however, used strategically mainly with a view to influencing buyer power, inefficiencies may arise.

Against the background of increasing retailer buyer power and the tendency for retailers to increasingly take over a larger share of the functions in the vertical chain, we aim at analysing how these developments could lead to an inefficient shift of functions in the vertical relationship. To this end, we build on a formal model which is described and analysed in the next section.

⁴⁸ While we do not document this with market share data, it is said that retailers are also gaining advantage vis-à-vis manufacturers in other rapidly growing or newly developing areas, such as regionally/locally produced goods or, for example, prepared foods to address consumers' changing eating habits in single households. Such a trend towards more innovation and even first-mover behaviour is possibly even more evident in markets besides Germany. Daskalova (fn 45) mentions the Netherlands and the United Kingdom in particular.

⁴⁹ Cf. Daskalova (fn 45), and Bergès-Sennou, F., P. Bontems, and V. Requillart, 2004. Economics of Private Labels: A Survey of the Literature. *J Agricultural & Food Indus Org*, 2: 1–25. Empirically, the impact of private label penetration on product prices has been analysed in various contributions. The introduction of private label products should in the short run exert downward pressure on manufacturers of national brands and thus, given sufficient retail competition, lead to lower retail prices for national brand products (Mills, D.E., 1995. Why Retailers Sell Private Labels. *J Econ and Management Strat*, 4(3): 509–528). Some studies suggest, however, that such a price decrease need not occur across all products, including affected national brands (on this topic and more generally, cf Chintagunta, P. K. and others , 2002. Investigating the Effects of Store-Brand Introduction on Retailer Demand and Pricing Behavior. *Management Science*, 10: 1242–1267, Ward, M.B. and others, 2002. Effects of the Private-Label Invasion in Food Industries. *Am J Agricultural Econ*, 84: 961–973, Gabrielsen, T.S. and others 2002. Private Label Entry as a Competitive Force? An Analysis of Price Responses on the Norwegian Food Sector, mimeo, Bontems (fn **Fehler! Textmarke nicht definiert.**)). Furthermore, private labels tend to reduce price comparability because the products are marketed exclusively by a single retailer, which can reduce retailer price competition and thus result in higher prices for both private labels and national brands (eg, Ailawadi, K.L. and others 2008. Private-Label Use and Store Loyalty. *J Marketing*, 72(6): 499–518).

IV. 'VERTICAL COMPETITION' AND INNOVATION

Introduction and Overview of Results

As noted previously, there may be efficiency rationales for why some innovations are more likely to be undertaken by manufacturers and others more likely to be undertaken by retailers, most notably through their private label products. Experience, economies of scope and scale, and closeness to consumers could all play a role in determining whether retailers or manufacturers take on the role of innovator. Still, the following analysis identifies reasons why inefficient substitution (or 'crowding out') of manufacturer innovative activity could be triggered by consolidation in the retailing industry. The analysis thus identifies why the market outcome may not be efficient in the presence of buyer power.

At first, from a welfare perspective, who assumes the role of innovator in an industry may seem irrelevant. However, we isolate various rationales for why there can be a decrease in welfare when, through an increase in size (which is the main source of buyer power that we consider), a large retailer uses private labels to take on a larger role in innovation. Once a retailer reaches a sufficient size that makes it worthwhile to innovate, we first show that a combination of the following two forces can inefficiently tip innovative activity towards retailers. The first force is a 'hold-up' problem for manufacturers, in case they still innovate and must share the proceeds, particularly when the threat of imitation exists. The second force is a 'rent appropriation' motive for retailers, who, when their size permits, may prefer to innovate on their own, even if this approach is less efficient, since it allows them to extract a larger share of the total profits that are created by the product innovation. The formal analysis shows that either of these two forces can be sufficiently large to inefficiently crowd out manufacturer innovation.

For these two forces (ie, the hold-up problem and the rent appropriation motive) to be at work, it is essential that the manufacturer must rely on the retailer to have access to consumers:

It is this ‘gatekeeper’ function of the retailer that is behind the hold-up problem and the rent appropriation motive, both of which may lead to an inefficient substitution of manufacturer innovative activity. However, once the manufacturer has access to different (competing) retailers, we identify another force that may lead to an inefficient and now even potentially anti-competitive substitution of manufacturer innovative activity. We identify a type of ‘waterbed effect’ that harms smaller retailers once the activity of a large retailer crowds out manufacturer innovation. When it dampens or even replaces manufacturer innovation, a large retailer’s own innovative activity reduces smaller retailers’ access to innovation and puts them at a competitive disadvantage.

The subsequent analysis proceeds stepwise. First, we consider a bilateral monopoly where a single manufacturer faces a single (and consequently large) retailer. This situation is not meant to capture the reality in a given market. The purpose of this simplification is, instead, to isolate those effects that do not depend on competition. We isolate two effects that suggest that under some circumstances innovation activity may inefficiently switch to a large retailer when it attains sufficient size. The two effects interact such that the first effect inefficiently reduces the innovation incentives of the brand manufacturer and the second effect inefficiently boosts the innovation incentives of the large retailer. When an innovation is truly performed more efficiently by the retailer through its private label, then this, of course, does not lead to inefficiencies. In fact, in the analysed model, innovation activity can never inefficiently remain with the manufacturer. However, even when it would be more efficiently carried out by the manufacturer, it may shift to the large retailer due to these two effects.

The analysis also allows for the possibility of the large retailer imitating a manufacturer’s product. When this is an option the manufacturer’s hold-up problem becomes potentially much more severe. The threat of imitation then exacerbates an inefficient shift of innovation activity to the large retailer and may even undermine innovative activity altogether. We stipulate in the

formal analysis that the retailer can imitate the manufacturer's innovation at a cost. While these costs can capture not only practical but also legal problems that can arise from such imitation, in many sectors (most notably food retailing), protecting innovations from being imitated is arguably difficult. In the process of developing and marketing an innovation, even branded goods manufacturers may have to share information with retailers that cannot be protected by traditional intellectual property rights. Once a manufacturer has, for instance, tested a new product and generated consumer awareness for it, a retailer could try to produce and market a private label look-alike on its own.⁵⁰ Trademark protection does not often seem extensive enough to catch the use of such copycats and look-alikes.⁵¹

At this point, it is also worth noting the difference in imitation incentives between a retailer and a rival manufacturer. This difference is important because it stresses why, in areas with low legal protection, imitation by retailers (or even the threat of it, as in the formal analysis) could become more relevant than the threat of imitation by rival manufacturers. Again, the key issue is that the retailer controls access to consumers and can thus always ensure that an imitated (private label) product is sold. As noted above, the retailer can also be sure to thereby appropriate all of the surplus, rather than having to share profits with the manufacturer (rent

⁵⁰ In the economics literature, for instance, this motivated the formal analysis in Allain, M. and others, 2011. Vertical Integration, Information and Foreclosure, mimeo. The threat of copycats and look-alikes has also been recognised in the UK's grocery inquiry (Competition Commission (fn 17)). The UK's Competition Commission warns that 'the exploitation by retailers of such a position could, in theory, reduce the ability of brand owners to realise a return on product innovation', which would lead to inefficiently low levels of investment in research and development in the future. Even though the Competition Commission's empirical review does not suggest any adverse effect on product innovation to date, it remains concerned that if these supply chain practices continue, investment and innovation might be negatively impacted in the future. The European Commission noted in the Kesko/Tuko merger case that 'private label development is a key element in the power wielded by retailers vis-à-vis branded daily consumer-goods producers. It enables retailers, who are inevitably privy to commercially sensitive details regarding the branded goods producers' product launches and promotional strategies, to act as competitors as well as key customers of the products. This privileged position increases the leverage enjoyed by retailers over branded goods producers' (Kesko/Tuko, Case IV/M.784, Commission Decision 97/277/EC [1997] OJ L 110/53 [152]).

⁵¹ In particular, some jurisdictions, such as the United Kingdom, require proof of actual misleading. The recent EC Directive 2005/29 on Unfair Commercial Practices specifically addresses misleading packaging. However, the Competition Commission concluded that 'packaging on its own is unlikely to provide a sustained basis for the success of an own-label product when competing with a branded product' and found 'any sustained negative effect on branded goods unlikely to be the result of copycat packaging'. Cf also Burt, S., and S. Davis, 1999. Follow My Leader? Lookalike Retailer Brands in Non-Manufacturer-Dominated Product Markets in the UK. *Intl Rev Retail, Distribution and Consumer Research*, 9(2): 163–185 on the possibility of consumer confusion and Dobson, P., 1998. *The Competition Effects of Look-Alike Products*, University of Nottingham on potential distortions to competition.

appropriation motive). This story changes completely if another manufacturer chooses to imitate, since it would still have to compete for access to consumers. In this competition the imitating manufacturer would have to cede most of the profits to the retailer, particularly if its product is a close imitation of the original. Apart from possibly having privileged access to an innovating manufacturer's information, a retailer may thus have particularly strong incentives for imitation (ie, compared to a rival manufacturer), of course provided the retailer is sufficiently large to make the respective fixed costs worthwhile.

The formal analysis introduces retail competition in a final step, which allows the manufacturer to at least partially sidestep a particular retailer. In practice, this may sometimes but surely not always be the case; that is, brand loyalty may occasionally (albeit most likely only in exceptional circumstances) be sufficiently strong to make consumers switch retailers in the search of their favourite brand. We show that, with competition, there can be inefficiencies when a large retailer duplicates innovative activity through its private label product. Such a situation can result in excessive investment costs. Potentially more serious from a competition perspective is the possibility of an innovation 'waterbed effect' arising when manufacturer innovative activity is crowded out by that of the large retailer. In that case, retail competition creates additional incentives for the large retailer, since, by crowding out a manufacturer's innovation activity, the large retailer gains a competitive advantage vis-à-vis smaller rivals. This suggests that the large retailer would gain from undertaking additional strategies that would essentially grant it a first-mover advantage. The strategy of developing a strong brand of private label products (or the retailer's own brand image) may serve such a purpose of committing to a 'first move' in innovative activity, which can inefficiently dampen the manufacturer's incentives, which always needs the retailer to gain access to consumers. In the analysed case this may even reduce horizontal competition with smaller retailers to the detriment of consumers.

Baseline Analysis

Setup

In the baseline analysis, we consider a single manufacturer and a single retailer. In this setting, we can isolate forces that, provided a retailer is sufficiently large to undertake innovation activities on its own, may lead to an inefficient substitution of manufacturing innovation. Later, retail competition is introduced, as well as the presence of both smaller and larger retailers. There, we also formally capture the (relative) size of an individual retailer compared to the overall market size of other retailers. However, this step is not necessary at this point.

The key decision problem that we look at is an investment to improve a single product. The original characteristics (eg, quality) are denoted by u_0 . That is, u_0 represents some measure of these characteristics, for example, how healthy the particular product is. Through investment these characteristics can be improved (eg, the nutrition value). The respective measure can then be increased to $u_I > u_0$. This setting is certainly highly stylised, as is much of the following analysis. However, it clearly demonstrates the underlying forces that drive the results. When the manufacturer undertakes the investment, the respective investment costs are I_M . When the retailer does so, the investment costs are I_R . We denote the joint profits from delivering a product with a certain quality to the market by $\Pi(u)$, which illustrates the dependency on the respective product characteristics/quality (ie, either $u = u_0$ or $u = u_I$).⁵²

In what follows, our measure of efficiency is $\Pi(u)$ (or, respectively, the difference between $\Pi(u)$ and the respective investment costs, if the investment is made). This measure equals total welfare when firms are able to extract the full consumer surplus. Even if this is not

⁵² Note that we thereby abstract from a specification of prices and quantities, which simplifies the presentation but does not affect the results. However, we need more notation below, namely, on prices and quantities, when we illustrate the possibility of a waterbed effect under retail competition.

the case, our subsequent comparative observations still relate to total welfare, as long as firms are able to appropriate the difference in surplus generated by the investment in higher quality. If, however, this is not the case (as in the retail competition we analyse below), then the benefits from innovation are typically understated when we only consider joint firm profits $\Pi(u)$. In particular, whenever retailer size and the exercise of buyer power reduce total innovative activity in the following analysis, considering only profits $\Pi(u)$ will tend to underestimate the resulting loss of welfare.

We assume that if the investment is made the resulting increase in joint profits (henceforth denoted by Δ) will exceed the investment cost of the manufacturer, ie $\Delta = \Pi(u_I) - \Pi(u_0) > I_M$, so that the innovation is always efficient, at least when it is undertaken by the manufacturer. We also postulate that the retailer has higher investment costs than the manufacturer to create higher quality, for example, through an ‘upgrade’ of its private label, ie $I_R > I_M$. This specification is, however, *not* essential for the results we derive subsequently. Rather, it can be shown that even if we allow for cases in which the retailer maybe able to innovate more efficiently, an inefficient substitution of retailer innovative activity cannot occur. Hence, by focusing on cases where the retailer has higher investment costs, we can analyse whether a shift of innovative activity from manufacturers to retailers takes place if and only if it is efficient. As we show, this is not the case.

Throughout the analysis we assume that not only the considered manufacturer, but also other manufacturers – notably those already producing private label products – are already able to produce the product with basic quality u_0 .⁵³ Consequently, when the innovation is made (or

⁵³ Although not critical for what follows, we thus implicitly also assume that, apart from the single retailer, only the manufacturer considered can make the upgrade investment to u_1 , rather than any other manufacturer that can procure the basic variant with characteristics u_0 .

initiated) by the retailer (eg, through its own private label), we envisage that the retailer can appropriate the full increase in joint profits, Δ .

Innovation Activity

Profit Sharing and Hold-Up When the Manufacturer Innovates

When the manufacturer has invested in higher quality, it still needs to contract with the (in this case monopolistic) retailer. This seems to be the most reasonable assumption for many manufacturers, in particular in food retailing. Instead, the case where the retailer could ex ante contribute to the investment outlay would be typical for private labels, which is the case that we capture when considering retailer innovation further below.⁵⁴

When only the manufacturer innovates, the net surplus that can be shared between the manufacturer and the retailer equals the difference in joint firm profits Δ . (At this time the initial investment made by the manufacturer, I_M , is already sunk.) When profits are shared equally, then, from an ex ante perspective, the manufacturer will invest only if its share of the increase in joint profits exceeds the necessary investment costs, ie if $\frac{\Delta}{2} \geq I_M$.⁵⁵ Consequently, when this condition does *not* hold, the manufacturer refrains entirely from investing, even though it would be efficient (recall that we assume that the increase in joint profits, Δ , exceeds the investment costs incurred by the manufacturer).

It is easy to show that if the retailer's costs of innovation are not too large though still larger than those of the manufacturer then in the case currently under consideration there will

⁵⁴ If it were possible for suppliers and buyers to ex ante jointly contract on, say, the development and introduction of a new product, then the decision to undertake the required investments should be independent of how overall profits are shared between the manufacturer and retailers. Such 'complete contracting' is clearly not always realistic, at least outside private labels, given competition between retailers, as well as the manufacturer's preference for keeping some details on innovation and production secret.

⁵⁵ Formally, such an equal distribution of the gross surplus, Δ , would arise from so-called symmetric Nash bargaining after the investment has been undertaken. Cf, for example, Grossman, E., and O. Hart, 1986. The Cost and Benefits of Ownership: A Theory of Vertical and Lateral Integration. *J Pol Econ*, 94: 691–719 and, more generally, Binmore, K. and others, 1986. The Nash Bargaining Solution in Economic Modelling. *RAND J Econ*, 17(2): 176–188.

be investment by the retailer, but not by the manufacturer (more specifically, this is the case if $I_R \leq \Delta < 2I_M$). That is, innovative activity will still take place, but it is inefficient because it is undertaken at higher cost by the retailer. When, instead, the retailer's innovation cost exceed the increase in joint profits from the innovation, ie $\Delta < I_R$, the innovative activity will not take place at all, since the retailer's own incentives are too low, given its high costs, and the manufacturer's incentives are too low as well, given the hold-up problem due to the subsequent sharing of the surplus from the innovation.

The results obtained so far are due to a standard hold-up problem. In the current case, the manufacturer cannot appropriate the entire surplus when it innovates, but only half of it. The resulting inefficiencies can then be either a shift of innovative activity, albeit at higher costs, to the retailer or a lack of innovative activity. As we show next, however, even when there is no such hold-up problem, since the manufacturer is in a position to extract (almost) all gains from its innovation, these inefficiencies may still arise – notably the inefficient switch of innovative activity to the retailer, albeit now due to a different rationale.

The hold-up problem will clearly arise as long as the manufacturer must rely on the respective retailer to access particular groups of consumers. As discussed in Section II with specific reference to the wider literature on buyer power, such gatekeeping is indeed more likely when a retailer has market power in some (local) markets. However, as noted there, shopping habits, such as one-stop shopping, can also contribute to a strengthening of retailer gatekeeping power. The results obtained so far are not novel. In the competition economics literature, as well as in policy papers, it is often suggested that it is precisely through this channel that the exercise of buyer power could stifle suppliers' incentives to invest and innovate.⁵⁶

⁵⁶ For instance, a report by the Federal Trade Commission, 2001. Report on the Federal Trade Commission workshop on slotting allowances and other marketing practices in the grocery industry, report by the Federal Trade Commission staff, Washington, D.C., p. 57 raises concerns that when, facing increasingly powerful buyers, 'suppliers respond by under-investing in innovation or production'. Likewise, a report on buyer power prepared for the European Commission (European Commission, 1999. Buyer Power and Its Impact on Competition in the Food Retail Distribution Sector of the European Union.

Retailer Innovation Due to a Rent Appropriation Motive

In the previous section, we showed how surplus sharing (with the gatekeeping retailer) and the resulting hold-up problem mute the manufacturer's incentives to innovate, which works towards inefficiently shifting innovation activity to retailers. We now enrich the analysis and show that the way profits from innovation are shared can also work towards inefficiently increasing a retailer's incentives to innovate, thereby crowding out the manufacturer's innovation.

We now examine the case when the manufacturer appropriates all surpluses from an innovation, provided that it undertakes the innovation alone (so that there is no duplication through an equal innovation by the retailer).⁵⁷ While, for the manufacturer, it would then always pay to invest, given that the respective joint profits it can now extract are larger than investment costs (recall that we assumed that the increase in joint profits exceeds the manufacturer's investment cost, ie $\Delta > I_M$), we show that innovation activity may still switch to the retailer instead. This is because the retailer now has strong incentives to use its gatekeeping function and replace the manufacturer's investment, to allow the retailer to extract a larger share of profits (albeit these are now lower, given its higher investment costs). We call this a rent appropriation motive of innovation.

Now the retailer innovates always when the increase in joint profits from the innovation, Δ , is sufficiently large to cover the retailer's innovation costs I_R . The retailer's incentives to

DG IV. European Commission, Brussels, p. 4) suggests that, when facing powerful buyers, suppliers may 'reduce investment in new products or product improvements, advertising and brand building'. Chen (Chen, Z., 2004. Countervailing Power and Product Diversity, mimeo) applies a hold-up problem to study the impact of a monopolist's buyer power on variety, while Battigalli and others (Battigalli, P. and others, 2006. Buyer Power and Quality Improvement, mimeo) analyse investment in quality in the context of competing retailers. The literature has analysed various other channels through which buyer power can affect manufacturers' incentives to invest and innovate (eg, Inderst and Wey (fn 8). It has been shown, in particular, that while buyer power may sometimes have a positive effect on incentives to invest, because it keeps manufacturers 'on their toes' (Inderst, R., and C. Wey, 2007. Buyer Power and Supplier Incentives. *Eur Econ Rev*, 51(3): 647–667, and Inderst, R., and C. Wey, 2011. Countervailing Power and Dynamic Efficiency. *J Eur Econ Assoc*, 9(4): 702–720), this is more likely to be the case for incremental improvements (or process innovation), but less so for new product development.

⁵⁷ Formally, this would arise whenever the manufacturer could confront the retailer with a take-it-or-leave-it offer. It can be shown, however, that for any possible sharing of the respective profits the present insights are robust.

then innovate regardless of whether it expects the manufacturer to innovate as well are due to a rent appropriation motive: Since the retailer expects to realise only a small share (currently exactly a zero share) of the gains from the innovation when only the manufacturer innovates, the retailer would rather duplicate the innovation, provided that its innovation costs are not too large.

In this section we focus on the case where the manufacturer can fully extract the increase in joint profits from the innovation, provided that only the manufacturer and not the retailer innovates. Note, however, that the rent appropriation motive will be present as long as the manufacturer extracts a share of the increase in joint profits (ie, as long as the retailer does not extract all of it). Instead, the previously analysed hold-up problem, which dampens the manufacturer's incentives to innovate, is present as long as the manufacturer does not fully extract the increase in joint profits. In the next section we combine these two forces.

Summary: Innovation Activity in Equilibrium (and Resulting Inefficiencies)

To fully analyse the outcome in the present bilateral monopoly case, we need additional specifications. That is, even the present 'semi-formal' analysis of innovation activity needs to be precise about when each party can make decisions. Still in a highly stylised way, we specify that the decision to innovate or not is made simultaneously by the retailer and the manufacturer.⁵⁸ In equilibrium, the decision whether to innovate or not must now be mutually optimal. That is, when one party (say, the manufacturer) chooses to innovate, then this must be more profitable than not innovating, given the manufacturer's expectations about what the retailer does. These expectations must, in turn, correspond to the retailer's true choice, which is, again, its optimal choice.

⁵⁸ For instance, this could be the respective decision to take up a new trend in consumer behaviour and develop and market a respective product in a particular segment. In reality, depending on the particular situation, there may be both some degree of overlap and first-movership of innovative activity.

Clearly, if the manufacturer expects the retailer to innovate for sure, then it is never optimal for the manufacturer to do the same, given the bilateral monopoly and the all-or-nothing nature of the considered innovative activity. In fact, this result hinges on the gatekeeping function of the retailer, since the retailer is essential for the manufacturer to sell to consumers. The reverse, however, does not hold.

Recall further that we identify two rationales for the inefficient substitution of manufacturer innovation activity by retailer innovation activity: the hold-up problem and the rent appropriation motive, depending on how gains are shared if only the manufacturer innovates. The way these gains are shared could depend on many determinants and we remain agnostic about this issue. Still, irrespective of how gains are shared, the inefficiency remains.

The preceding discussion can be summarised as follows. Take the baseline case with a single manufacturer and a single (large) retailer, where both sides can choose whether to invest in a given innovation. Then, even when the retailer's investment is less efficient (since its investment costs are higher than those of the manufacturer), the outcome is biased towards the retailer's investment, which then inefficiently substitutes for an innovation by the manufacturer. This inefficiency occurs because the retailer's gatekeeping role either undermines the manufacturer's incentives to innovate due to a hold-up problem or generates additional incentives for it to appropriate rents. The following results are obtained.⁵⁹

- i) Take the case where the manufacturer can extract *all gains* when only it but not the retailer invests in the innovation. Then only the retailer will invest as long as the increase in joint profits at least cover its higher investment costs, ie as long as $\Delta \geq I_R$.

⁵⁹ To obtain these results, we need to impose the following equilibrium requirement: When there are multiple equilibrium outcomes (ie, one where only the manufacturer would invest and one where only the retailer would invest) and if one of these outcomes is preferred by both the manufacturer and the retailer, we assume that the two sides coordinate on the respective outcome.

ii) Take the case where the *gains are equally shared* when only the manufacturer innovates. Then the retailer innovates when the gains are sufficiently large (more specifically it can be shown that this is the case if $\Delta \geq 2I_R$), while otherwise the manufacturer innovates (or there is even no innovation at all, which is the case when $\Delta < 2I_M$).

These results sum up the two isolated forces that could inefficiently shift innovation activity to a large retailer.⁶⁰ Since the manufacturer must rely on the gatekeeping role of the (currently monopolistic) retailer, there can be a hold-up problem, which reduces its incentives to innovate. Further, if the retailer can extract a much larger fraction of the total gains by investing itself, it has an incentive to innovate even if this can be more efficiently done by the manufacturer.

The Threat of Imitation

We now assume that the retailer has the chance to imitate the manufacturer's innovation. That is, it can use the innovation even if it has not previously innovated and has also not come to an agreement with the manufacturer. To illustrate clearly the additional economic forces that the possibility of imitation (and its threat) generates, we specify that the success of such an imitation activity be complete, so that the resulting product also delivers the higher quality u_I , but at a cost K to the retailer. Clearly, imitation will only be of interest when the retailer's imitation costs are lower than the increase in joint profits that can be extracted from the innovation, ie if $K < \Delta$.

In addition, we specify that imitation involves fewer resources for the retailer than innovating, ie $K < I_R$.

⁶⁰ Recall that at this point, the retailer is, by assumption, large, since as it covers the same market that the manufacturer would cover, namely, all possible consumers.

Before we proceed, it is worth noting the difference in imitation incentives between a retailer and, say, another manufacturer. As the analysis shows, a retailer indeed has such incentives. In fact, when the retailer fails to reach an agreement with the manufacturer on the terms and conditions of delivery of the innovated product, imitation pays, since the retailer controls access to consumers and can thus sell the copied version. This case would be entirely different if another manufacturer chooses to imitate. In the simplest case, there would be two identical versions of the product on the market. The copying manufacturer would, however, still have to compete for access to consumers, which retailers (or, in the present case, the monopolistic retailer) control. In this competition to be listed at the retailer, the imitating manufacturer would realise few (if any) gains from its investment. This short discussion is vital in that it emphasises why, apart from possibly having privileged access to an innovating manufacturer's information, a retailer may have particularly strong incentives for imitation (ie, compared to a rival manufacturer), provided the retailer is sufficiently large to make the respective fixed costs worthwhile.

The precise analysis of innovation activity under the threat of imitation again depends on the precise specification of when the different decisions take place. We specify that the possibility to imitate can still be used after negotiations with the manufacturer. The threat of imitation restricts the profits that the manufacturer can extract from an innovation, even if it is currently the only innovator. Since the retailer can reject any proposal and instead imitate the manufacturer's innovation, the respective imitation cost K is also the maximum that the manufacturer can realise. If we endow the manufacturer with all bargaining power, since it can make a take-it-or-leave-it offer, then its payoff from innovating is indeed always constrained

by the threat of imitation and thus equal to K . Otherwise (ie, with equal surplus sharing), it is $K/2$.⁶¹

What is immediately noticeable here is that the threat of imitation reduces the manufacturer's expected profits, thereby exacerbating the aforementioned hold-up problem. As we discuss more explicitly below, where retailers of different size are considered, the (credible) threat of imitation should also depend on a retailer's (critical) size. In this sense, retailer consolidation further aggravates the problem of an inefficient substitution of manufacturers' innovation activity through this channel, provided that the hold-up problem is sufficiently important. In fact, when there is equal surplus sharing, then the manufacturer now innovates only when the retailer's imitation cost are sufficiently large (more specifically, when $K > 2I_M$ and thus no longer when $\Delta > 2I_M$, as in the case where imitation is not possible). Matters are more complicated when, instead, the rent appropriation motive dominates, albeit this can be somewhat reduced when the retailer can also wait and threaten to imitate.

In summary, the preceding discussion clearly illustrates that the possibility of imitation by the (large) retailer will make it more likely that no innovation will take place at all, while – at least when there is surplus sharing from an innovation – it shifts innovation activity (inefficiently) to the retailer, since it exacerbates the hold-up problem that the manufacturer faces.

⁶¹ When surplus is shared through negotiation, what matters is the retailer's outside option of imitation, which yields $\Delta - K > 0$ (while the manufacturer then ends up with zero profits, since it relies on the currently monopolistic retailer). When the net surplus (now the difference in total profits from the innovation and the outside option payoffs) is still split equally between the manufacturer and the retailer, then we find that the manufacturer realises only $K/2$ from the innovation (ie, after subtracting initial investment costs, only $K/2 - I_M$).

Retail Competition

Setup

We now introduce retail competition. We suppose there are N different retail markets. For simplicity, we specify that in each market there are only two competing retail outlets.⁶² Throughout the analysis we restrict consideration to a single large retailer owning more than one outlet. We conduct a comparative analysis in the growth of this retailer through the acquisition of outlets in other markets (next to the still to be discussed organic growth through a waterbed effect when it can crowd out manufacturer innovative activity). We assume that the large retailer owns one outlet in n_L of the N markets.

In the following, we restrict our discussion to a description of profits in reduced form. Suppose that all retailers procure the single considered good of quality u from the same manufacturer. We denote the total profits that are realised with a single retailer by $\pi(u, u)$.⁶³ Note that we now use lowercase letters for profits to clarify that these are only profits in a single retail market. But we can also expand this case to that where retailers sell products of different qualities, for example, since only one procures from the innovating manufacturer or since only one innovates. The profit realised by a retailer that has higher quality, namely, u_I , is then $\pi(u_I, u_0)$, while in this case the profit realised by the rival is $\pi(u_0, u_I)$. It holds that profits at a given retailer are highest when only this retailer has the product of higher quality, while they are lowest when only the respective rival has the product of higher quality.⁶⁴

⁶² The modelling setup is that of Inderst, R., and T.M. Valletti, 2011. Buyer Power and the “Waterbed Effect.” J Indus Econ, 59(1): 1-20.

⁶³ We consider the case in which bilateral contracts are not observable to other retailers. Thereby appealing to a well-known opportunism problem, namely, that the manufacturer cannot manage to dampen intrabrand competition, the manufacturer will thus supply goods at conditions so that the marginal wholesale prices equal marginal costs.

⁶⁴ In formal terms, this condition can be stated as $\pi(u_0, u_I) < \pi(u_0, u_0) \leq \pi(u_I, u_I) < \pi(u_I, u_0)$. Note, also, that when $\pi(u_0, u_0) = \pi(u_I, u_I)$ holds with equality, then in the symmetric case all benefits from the higher-quality products would be competed away, to the benefit of consumers.

If we assume that the imitation cost exceed the additional profits from the innovation any given retailer can realize in a *single* market provided that its rival retailer has already innovated⁶⁵, it immediately follows that a small retailer with a single outlet would never have sufficient incentives to either imitate an innovation or even innovate itself (since $K < I_R$). Given this assumption, retailer size matters.

If, however, the innovation cost are lower than the additional profits from the innovation that can be realized in *all* markets provided that the respective rival retailers in each market have already innovated⁶⁶, it follows that a large retailer owning an outlet in *all* markets would always have sufficient incentives to innovate; otherwise, it would be at a competitive disadvantage with respect to rivals. Again, this assumption makes it possible to focus on the case where retailer size matters (ie where $1 < n_L < N$), since it changes retailer behaviour (as n_L increases).

In the following, we isolate the new aspects that arise when competition is introduced. These can be the possibility of inefficient duplication of innovative activity, as well as the possibility of a ‘waterbed effect’ arising when manufacturer innovative activity is crowded out. In the latter case, competition will then generate additional incentives for the large retailer to crowd out the manufacturer’s innovation activity.

Returns from Innovation

Manufacturer’s Return from Innovation

Note that at this point we do not allow for the possibility of imitation, which is introduced later. If only the manufacturer innovates, then no retailer has an alternative if it wants to stock the high-quality product.

⁶⁵ Formally, this condition can be stated as $K > \pi(u_I, u_I) - \pi(u_0, u_I)$.

⁶⁶ Formally, this condition can be stated as $I_R < N[\pi(u_I, u_I) - \pi(u_0, u_I)]$.

Consider first a small retailer.⁶⁷ Recall next that, in one setting we consider, the manufacturer can now make a take-it-or-leave-it offer to all retailers simultaneously. The manufacturer can now use retail competition to its advantage. The small retailer operating in a single market only can expect the rival outlet to stock the higher-quality product. Hence, if it does not agree with the manufacturer's offer, its profits will be (u_0, u_I) which, by assumption, is lower than $\pi(u_I, u_I)$. Consequently, under a take-it-or-leave-it offer, the manufacturer can appropriate the full additional profits of a small retailer from offering the higher-quality product, ie the difference $\pi(u_I, u_I) - \pi(u_0, u_I)$. When, instead, there is joint surplus sharing, then the manufacturer obtains half of the additional profits of a small retailer from offering the higher-quality product, ie $\frac{1}{2} * (\pi(u_I, u_I) - \pi(u_0, u_I))$.⁶⁸

Consider next the large retailer, which controls n_L outlets. If it has not innovated itself (since there is, at present, no option of imitation), then the manufacturer obtains from the large retailer just n_L times the payoff that it obtains with each of the small retailers. In other words, when the large retailer does not innovate and there is no option of imitation, then in the model currently under analysis, the size of the large retailer does *not* impact the terms of trade and thus the manufacturer's payoff. This is because we fully abstract from many other sources of size-related bargaining power and focus, instead, on the interaction of innovative activity and retailer size.⁶⁹

If the manufacturer and the large retailer now innovate, then the manufacturer can only extract a positive payoff from the small retailers. Consequently, the respective payoff is given

⁶⁷ As already noted above, the contract offered by or negotiated with the manufacturer will specify a marginal wholesale price equal to the marginal costs of production. Hence, the manufacturer will receive its share of profits through a higher wholesale price on 'inframarginal units'. In the literature, this scenario is typically modelled through a so-called two-part tariff contract, which – in addition to a constant per-unit wholesale price – admits a fixed transfer.

⁶⁸ The net surplus in each negotiation is indeed $\pi(u_I, u_I) - \pi(u_0, u_I)$, which is shared equally under the chosen symmetric Nash bargaining.

⁶⁹ In particular, with constant marginal costs and without a better alternative for the large retailer at this stage of the game, the sources of buyer power identified in Inderst and Wey (fn 56) are not present.

as follows. Evidently, since these smaller retailers control altogether $2N - n_L$ outlets (recall that there are two outlets in each of the N markets), with a take-it-or-leave-it offer the manufacturer realises profits of $2N - n_L$ times the additional profits from the innovation of any small retailer, ie $(2N - n_L)[\pi(u_I, u_I) - \pi(u_0, u_I)]$ or, under surplus sharing, only half of these profits.

Retailer Innovation Incentives

Given our assumption that the imitation cost exceed the additional profits from the innovation any given retailer can realize in a *single* market provided that its rival retailer has already innovated (together with the assumption that imitation involves fewer resources than innovation, ie $K < I_R$), we can focus on the *large* retailer's incentives to innovate. Suppose the manufacturer is expected to innovate. The retailer would then, as without competition, want to also innovate when the respective rent appropriation motive is sufficiently strong. Irrespective of whether the manufacturer makes a take-it-or-leave-it offer or whether profits are shared equally between the manufacturer and the retailer, it can be shown that the higher the number of outlets the large retailer controls, the higher its incentives to innovate, since the respective costs can then be distributed over a larger volume.

Inefficient Duplication and the Waterbed Effect

What is new compared to the case of a bilateral monopoly is the possibility that both the manufacturer and the large retailer innovate, which leads to an inefficient duplication of investment costs. In this case the manufacturer offers its product only through the small retailers, while the large retailer offers its own high-quality (private label) product. This case now arises when the large retailer is sufficiently large, ie owns a sufficient number of outlets, and its (higher) innovation costs are not too high. As evidenced in the previous analysis, the large retailer's incentive to duplicate innovation is the rent appropriation motive. On the other

hand, when the large retailer is still sufficiently small (small n_L), only the manufacturer innovates.

In the case of duplication, all retailers will have access to the innovated product, albeit with lower welfare since the innovation costs are incurred twice in the economy. Such a scenario occurs when the large retailer's size becomes sufficiently large. However, if the large retailer's size increases further and innovation costs are not too low, then only the large retailer may innovate. This is because, as the retailer grows larger, the remaining sales volume of the manufacturer decreases and may, eventually, become sufficiently small so that the manufacturer will no longer be able to cover its investment costs. The fact that the manufacturer then ceases to innovate now provides additional incentives for the large retailer to innovate. This is because by crowding out the manufacturer's innovation, smaller retailers are deprived of the respective innovation, such that the large retailer obtains a competitive advantage in markets where it competes with outlets operated by small retailers.

In the case where only the large retailer innovates and offers the product with higher quality, two types of inefficiency are present. The first inefficiency arises since the large retailer innovates even though it has higher innovation costs (recall that throughout the analysis we assume that $I_R > I_M$). The second inefficiency (which may possibly be more important from a competition policy perspective) arises because the anticipation of the large retailer's innovative activity stifles the manufacturer's activity, which deprives smaller retailers of access to high-quality products. We therefore term this a (non-price) waterbed effect: The large retailer gains a competitive advantage over its rivals when smaller retailers are deprived of the innovation.⁷⁰

⁷⁰ The term waterbed effect, denoting how large buyers can harm smaller buyers through a deterioration of the latter's terms and conditions, is used in Inderst and Valletti (fn 62) and Inderst, R., 2007. Leveraging Buyer Power. *Intl J Indus Org*, 25: 908–924.

An interesting formal observation can now be made that also has practical implications. Under some circumstances, two equilibrium outcomes are possible: one where only the large retailer innovates and one where only the manufacturer innovates. Anticipation of the manufacturer's innovation makes it no longer optimal for the large retailer to invest and vice versa. Such a situation may also arise without competition, but previously we could rule this out by appealing to coordination, given that both the manufacturer and the (monopolistic) retailer prefer the more efficient outcome where the manufacturer invests. This is now no longer the case: There is a conflict of interest. Both the manufacturer and small retailers would prefer the scenario where the manufacturer still innovates and supplies all outlets, while the large retailer would rather crowd out the manufacturer's investment.

Hence, with retailer competition a situation arises where the large retailer would benefit from 'inducing' an outcome where its innovation basically forestalls the innovative activity of the manufacturer to the detriment of smaller retailers. What makes this outcome additionally profitable for the large retailer compared to that where the manufacturer innovates is the competitive advantage vis-à-vis its rivals. Realistically, albeit outside the present modelling environment, one should then expect the large retailer to undertake additional strategies that would essentially grant it a first-mover advantage. Without providing a further formal analysis, from this perspective the strategy of developing a strong brand of private label products may serve the purpose to commit to a first move in innovative activity, which can dampen the manufacturer's incentives.

Recall that without competition a reduction of imitation costs – or, more generally, the introduction of the possibility of such imitation – has the effect of aggravating the hold-up problem that the manufacturer faces (in the case of surplus sharing). This relation holds even more so as the retailer becomes larger. When the manufacturer but not the large retailer innovates, it is only through the threat of imitation in the present model that an increase in the

number of outlets that the large retailer controls reduces the manufacturer's profit (compared to the case where these outlets are still controlled by smaller retailers, for which such imitation is not sufficiently attractive). Aggravation of the hold-up problem makes it more likely for innovative activity to shift away from the manufacturer. When innovation activity is picked up by the large retailer, it enjoys a competitive advantage. The possibility to imitate, which only pays when the retailer is already large enough, thus facilitates the crowding out of the manufacturer's innovative activity and thus makes the waterbed effect previously identified more likely.

Taking stock, we identify the following rationales for why in the considered economy there can be a shift of innovative activity away from the manufacturer and to a large retailer, even when this is inefficient. As in the bilateral monopoly case, when a hold-up problem arises from surplus sharing, it reduces the manufacturer's incentives to innovate. Incentives for retailer innovation, on the other hand, stem from the objective of obtaining a higher share of the total surplus, even where the resulting surplus is lower due to inefficiently high investment costs (rent appropriation). With competition, this can now even give rise to the duplication of innovation costs. However, the outcome where only the large retailer innovates can, in particular, now also ensure that it gains much more when only it, but not smaller rivals, has access to the described high-quality product (waterbed effect).

Relation to the 'Price Waterbed Effect'

When only the large retailer innovates in the model, the value of its offering to consumers increases, but when it crowds out the innovation of the brand manufacturer, it may deprive smaller retailers of an equally competitive position. We called this the waterbed effect, since in this case the advantage of the large retailer comes at a disadvantage to smaller retailers. The causal link is the reduced innovative activity of the brand manufacturer.

We briefly digress to present the more standard waterbed effect theory of harm, since, despite the obvious difference, there are some interesting links. If a powerful retailer obtains a discount that it (at least partially) passes on to consumers, its own clientele should benefit.⁷¹ This effect may even result in a ‘virtuous’ cycle, since it leads to further growth and discounts that may then be passed on to consumers and since competitors may have to follow suit and cut prices as well. However, this argument not only rests on the presumption that smaller retailers can stay in the market instead of being squeezed out, which could result in higher concentration and prices in the long run, but also presumes that the discount given to the more powerful buyer will not have a waterbed effect⁷² on the purchasing prices of other, less powerful retailers.⁷³

The possibility of such a waterbed effect has recently achieved sound theoretical footing. If the exercise of buyer power erodes suppliers’ profits, in the long run some suppliers may be forced to exit or to merge to survive, which should put upward pressure on wholesale prices. But even if the upstream market structure remains unchanged, the bargaining power of smaller and less powerful buyers may deteriorate when they face more aggressive pricing by their larger, more powerful rivals. One reason for this is straightforward: Just as a large buyer can use its size to obtain discounts, the reduction in volume reduces the outside options of less powerful retailers and, thereby, could lead to a deterioration of their own terms of trade (provided that a manufacturer does not want to counteract this tendency).⁷⁴

There is an interesting twist in this waterbed effect argument that links it closely to the discussion in the present section. Ignoring innovation for a moment, suppose that the large

⁷¹ This assumes that the exercise of buyer power, which is necessary to obtain such a discount, leaves unchanged the variety of goods that are offered. Mergers between retailers, which give rise to buyer power through an increase in size, may lead to such a reduction in variety. Inderst, R., and G. Shaffer, 2007. Retail Mergers, Buyer Power, and Product Variety. *Econ J*, 117(516): 45–67 show how, in addition, the use of delisting as a strategy to increase buyer power reduces variety.

⁷² This term is used, for instance, in Foer, A.A., 2006. *Mr. Magoo Visits Wal-Mart: Finding the Right Lens for Antitrust*, mimeo when discussing the potential impact of Wal-Mart.

⁷³ This possibility is explicitly recognised in the European Commission’s guidelines on horizontal agreements, here in the form of buyer groups (European Commission, 2001. *Guidelines on the Applicability of Article 81 of the EC Treaty to Horizontal Agreements*, Office Journal C31/5-18, European Commission, Brussels, paras. 126 and 135).

⁷⁴ This reasoning is formalised in Inderst (fn 70), where it is also shown that a waterbed effect is likely to be stronger when the affected retailer is already particularly weak.

retailer sells a private label product while other retailers sell the respective product of a single branded goods manufacturer. The starting point of the argument is now not so much a discount that the larger buyer enjoys. Consider, instead, a merger by which a still larger fraction of the industry is controlled by the respective large retailer, so that, likewise, the market share of the respective branded product is reduced. Any fixed costs generated by the production, marketing (eg, a national campaign), or distribution of the branded product must then be distributed over a smaller volume, which should raise costs for the respective retailers.⁷⁵ Similarly, economies of scale can no longer be enjoyed to the same extent by the respective manufacturer(s), which should also increase the wholesale prices for retailers.⁷⁶

Such a waterbed effect is very much akin to that analysed with respect to innovation in this section. However, in addition to the loss of volume that the large retailer's private label production implies for the manufacturer, we also identify a competitive effect, namely, that the innovative activity of the large retailer dampens that of the manufacturer of branded products, thereby reducing the competitiveness of smaller retailers.

V. CONCLUDING REMARKS

This study is motivated by the growing consolidation of retailers and the spread of private label products, both of which increase buyer power of large retailers. Over the last decade, competition policy has become increasingly concerned about the implications of these developments for competition and welfare. We identify additional channels through which the exercise of buyer power can lead to harm to competition and welfare. These channels focus on

⁷⁵ Cf Majumdar, A., 2005. Waterbed Effects and Buyer Mergers, mimeo for a formalisation.

⁷⁶ A related argument suggests that there may be a tipping point for the economic viability of some of the supporting infrastructure on which smaller retailers jointly rely, such as buyer groups or independent wholesalers. If market shares become sufficiently low, the generated business may be too little to support this infrastructure, which would further deteriorate the purchasing conditions of small retailers. This argument is suggested in the Office of Fair Trading, 2006. Grocery Market: Proposed Decision to Make a Market Investigation Reference, where it is applied to the entry of large multiples into the convenience store market.

the allocation of functions between retailers and manufactures in a process that we call ‘vertical competition’.

This ‘vertical competition’ over functions between branded goods manufacturers and large retailers has been largely overlooked in the current discussion over the implications of buyer power and retailer consolidation. The results in this study suggest that these deficiencies need to be corrected so as to correctly assess the implications of buyer power and the growing importance of private labels on competition and welfare. In particular, given the chosen focus on innovation, retailer consolidation and the exercise of buyer power may cause inefficiency by crowding out innovations of branded goods manufacturers. At the heart of the various arguments is the ‘gatekeeping’ function that retailers frequently maintain.

Though the formal model focuses on innovation, the underlying argument is more broadly applicable. Retailers have often turned into powerful competitors over various functions in the vertical chain. Such functions comprise, next to product innovation, quality certification, as well as distribution and marketing. Control of a larger share of these functions, notably but not exclusively through private labels, ensures large retailers not only a larger share of the overall created value but also a better strategic position in their negotiations with brand manufacturers. To provide a background for the analysis and the thereby developed arguments, our analysis has documented how, as retailers have grown in size, functions have increasingly shifted to large retailers, notably in European food retailing. With respect to private labels, this comprises increasingly also the function of innovation.

As already noted, some of the theories of harm developed in the formal analysis build squarely on an asymmetry between manufacturers and retailers, as the latter control access to consumers, in particular when they can act as ‘gatekeepers’. Competition law and policy may even strengthen such ‘gatekeeping’, eg by granting retailers unrivalled control over the final price through a strict implementation of a prohibition of retail price maintenance. This suggests

the need to rethink such policies, notably how a prohibition of retail price maintenance and possible substitutes to control the retail price is enforced, in light of creating a level playing field between manufacturers and retailers for their ‘vertical competition’ over functions.

Lastly, the analysis suggests the existence of what we call an innovation ‘waterbed effect’. Besides negatively affecting overall efficiency and welfare, this effect distorts horizontal competition. It arises when by ‘crowding out’ the innovative activity of branded goods manufacturers, a large retailer gains a competitive advantage vis-à-vis smaller retailers. The formal analysis also shows how this can become more likely when there is a threat of imitation of manufacturers’ innovation by large retailers with private labels.