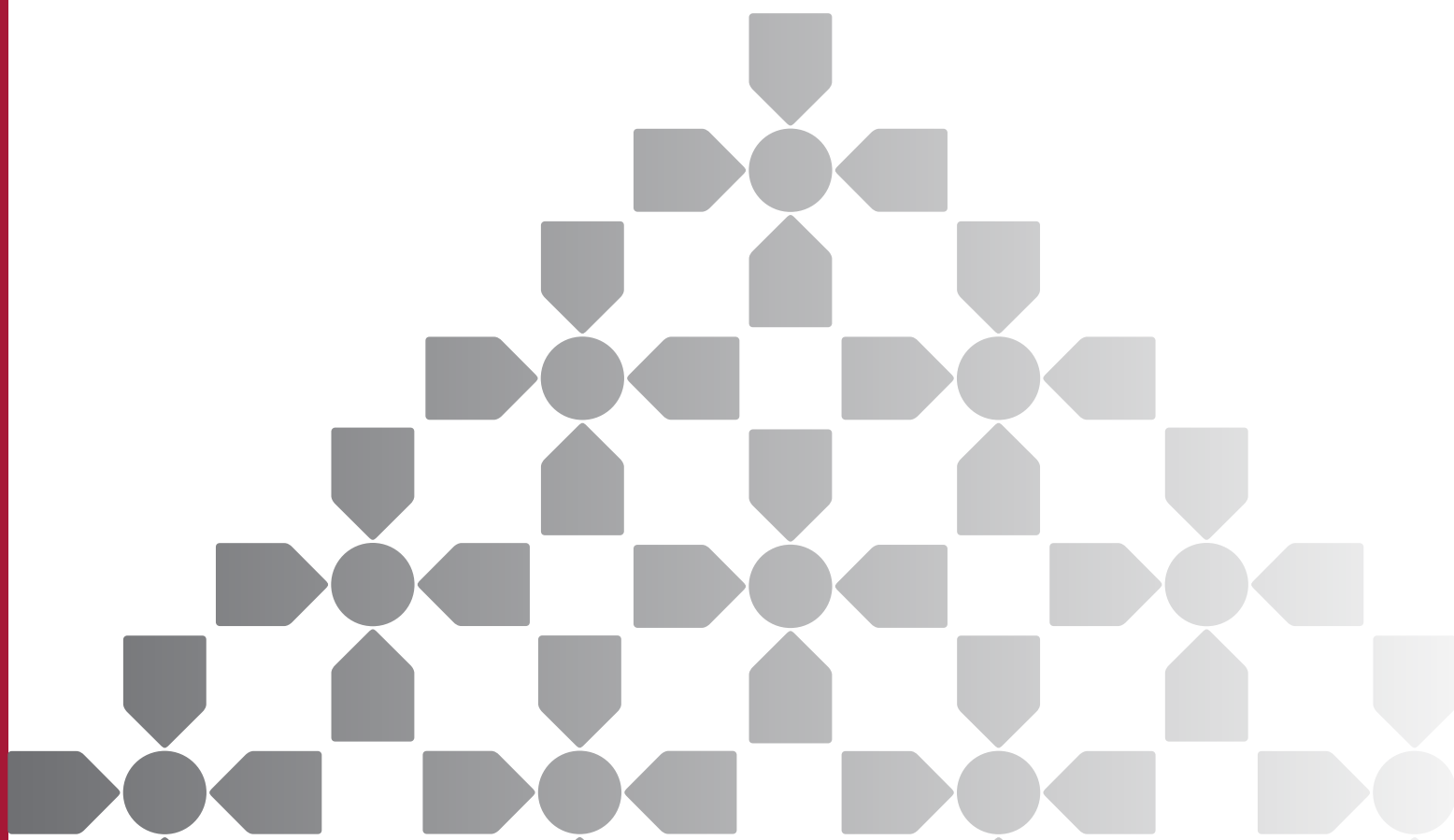# Raising rivals' costs or improving efficiency?

An exploratory study of managers' views on backward integration in the grocery market

Hanna Skjervheim Bernes, Isabel Marie Flo, Øystein Foros og Hans Jarle Kind

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Raising rivals' costs or improving efficiency?
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by

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Raising rivals' costs or improving efficiency?

An exploratory study of managers' views on backward integration in the grocery market[1]

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Abstract: Large retail grocery chains' backward integration into distribution, procurement and production is controversial, and has received a lot of attention by both policy makers and market players. If a large retail chain for instance takes over scale intensive distribution activities from its suppliers, direct distribution from these suppliers to other retail chains might become more expensive (and might even initiate costly industry-wide backward integration). An interesting question is thus whether large retailers undertake backward integration mainly for efficiency reasons or whether they do so in order to gain a competitive advantage through raising the costs of the smaller rivals. Theory and econometric analyses are inconclusive. The current study uses a survey to investigate managers' views on this issue. The study is explorative, and thus does not formally test different theories, but our findings indicate that large retail chains' incentives to backward integrate are mainly related to efficiency rationales.

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1 Introduction

At least since The Great Atlantic & Pacific Tea Company's (A&P) massive involvement in manufacturing in the early 20th century, both market players and policy makers have paid great attention to the pros and cons of backward integration by large retail grocery chains. Through backward integration into the supply chain (factories, warehouses, trucks etc.), A&P became a vertically integrated chain,[3] and thereby achieved significant competitive advantages over its smaller rivals. Analogously, direct sourcing and backward integration into distribution are key elements behind Walmart's competitive advantages in the US market today (Ellickson, 2016, Basker, 2007). We have observed a similar development in most European markets, though typically with some decades lags compared to the United States (Ellickson, 2016).

A simple rationale behind backward integration is to achieve efficiency gains through cost reductions. Galileo Galilei's "square-cube law" from 1638 implies that if the area of an object increases by a square; the volume increases by a cube. Translated into distribution, a large retail chain that takes care of its own distribution instead of relying on a number of smaller suppliers may be able to improve distribution efficiency by increasing load factors and using larger vehicles. This efficiency gain may in turn create a competitive advantage for the retail chain. As a stylized illustration, suppose that suppliers independently take care of distribution (direct distribution) and that each vehicle delivers one particular brand (beer from a given brewery for instance). Such a distribution system is competitively neutral for retailers, since unit distribution costs for a retail chain with few stores are the same as for a chain with a large number of stores, other things equal. In contrast, if a large retail chain backward integrates into distribution, it will typically carry many different products in each vehicle. Thereby the frequency of deliveries for a given product line can be higher, and costs fall compared to what smaller rivals are able to achieve. This creates a competitive advantage for larger retail chains.

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[3] Interestingly, a pull factor behind A&P's backward integration seems to be that the company wanted to sell breakfast food products at a lower price than the one set by the dominant producer, Cream of Wheat (see https://en.wikipedia.org/wiki/The_Great_Atlantic_%26_Pacific_Tea_Company). Cream of Wheat's use of retail price maintenance (RPM) was approved by District Court Judge Charles Hough , and contrasts sharply with the U.S. Supreme Court's decision in the Dr. Miles v Park & Sons case.

As emphasized by Holmes (2001), new technologies allow "today's order to be based on today's inventory", and give rise to efficiency gains from a distribution system that increases delivery frequency. The question that begs to be asked is whether backward integration into distribution is required to capture these efficiency gains. On the one hand, arm's length logistics firms (third-party providers) may achieve the same increase in delivery frequency in a given geographical area, and we may still have a competitively neutral system from the retail chains' perspective. On the other hand, implementation of digital logistics systems may require a high degree of vertical coordination between the distribution level and the store level, and this may favour backward integration. According to Holmes (2001), such factors might explain why large retail chains such as Walmart backward integrate into wholesale operations. Third-party distribution may be less efficient due to lack of vertical coordination (transaction costs).

Against this backdrop, we pose the following research questions:

- Is the motivation for large retail chains' backward integration mainly to create efficiency gains, or

- is it mainly to gain competitive advantages over smaller retail rivals?

The entire vertical industry structure might change if the largest retail chain (such as A&P in the past and Walmart in the present US market) in a given market backward integrates. The reason is that it may become too costly for upstream suppliers to continue with direct distribution without the largest retail chain on board. Consequently, the largest retail chain may control a "veto" that forces all retail chains over to backward integration even if this should be inefficient per se for smaller chains. This indicates that a potential rationale for the largest retail chain may be to achieve a competitive advantage by raising rivals' costs (Salop and Scheffman, 1983, and subsequent papers)[4], with the result that the industry moves away from a competitively neutral distribution system towards a distribution system where retail size matters.

If the size effect also has an impact on unit (marginal) costs, backward integration may make retail competition more aggressive. Consumers are then not just customers, they are also inputs used to reduce marginal costs. Capturing one more consumer will reduce marginal

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[4] Hviid and Olczak (2016) analyze how raising fixed costs may be used to exclude rivals.

costs, such that there is in fact an additional opportunity cost of raising prices not present in a competitive neutral distribution system (Foros and Kind, 2017). Even if retail competition becomes more aggressive, the largest retail chain may achieve a competitive advantage over smaller rivals. Therefore, we may have a situation where the largest retail chain prefers to move away from a competitively neutral distribution system even if this increases its marginal costs. At first glance, we may then expect that consumers will be hurt. This need not be the case, however. If the competitively neutral distribution system breaks down, retail competition becomes more aggressive, all else equal. Therefore, we may have a situation where unit (marginal) costs increase due to backward integration, but prices to consumers go down. Below, we set up a simple model to demonstrate this possibility.

There is a comprehensive theoretical literature on channel coordination and supplier-retailers relations' impact on retail pricing. Unfortunately, predictions are ambiguous and critically depend on assumptions about which types of vertical restraints are used (e.g. uniform or non-uniform wholesale tariffs), whether wholesale terms of trade are observable or not, and so forth. Furthermore, the empirical literature is limited, partly due to the confidential nature of the contracts between upstream suppliers and downstream firms (e.g. retail chains) when it comes to the specific elements in wholesale tariffs on procurement and distribution. We therefore adopt an exploratory approach, where we undertake semi-structured interviews in order to zoom in on managers' views on backward integration. Using an explorative approach to reveal managers' views on controversial practices in vertical channel coordination resembles the analysis of Bloom et al. (2000); they investigate managers' views on slotting allowances.

We have undertaken the explorative study in the Norwegian grocery market. At the retail level, the market is highly concentrated. Four retail chains control 99% of the market: NorgesGruppen (market share 39%), REMA (23%), COOP (23%), ICA (11%), and BUNNPRIS (4%).[5] In 2015, there was a merger between Coop and Ica (see Foros and Kind, 2017, for more details). Due to high customs barriers, there are high entry barriers both at the retail and at the supplier level in this market.

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[5] Source market shares: AC Nielsen, 2014.

We believe that explorative studies might be useful for competition policy investigations. Competition authorities regularly interview market players when investigating e.g. merger cases, but to the best of our knowledge, they do not employ quantitative methodologies to analyse the responses. Compared to quantitative econometric analyses, that might be difficult to undertake within the time-constraints the authorities have in e.g. merger cases, such explorative approaches may constitute important supplements.

2   A simple model

It might obviously be an equilibrium outcome for a large retail chain to backward integrate if this makes the retailer more efficient, for instance through reducing marginal costs. However, in this section we show that, somewhat surprisingly, the retailer might find backward integration profitable even if it might both make competition more aggressive and increase marginal costs. In Section 3, we explain the methodology we have used in the explorative study and present the results. Then, in Section 4, we conclude and discuss the findings.

We follow Cachon and Harker (2002) and Foros and Kind (2017) and assume that unit distribution costs are decreasing in volume:

(1) $C(X_i) = c - \beta X_i$

In equation (1), X_i is the number of consumers served by the distribution network. On the demand side, we assume a spatial set-up as in the linear city of Hotelling (1929). Consumers are uniformly distributed along the line with length equal to 1. The two retail firms are located at point zero and one, respectively (firm 1 at zero and firm 2 at one). We restrict the analysis to outcomes with full market coverage (all consumers buy from one and only one of the firms) and market sharing (both firms are active in the market). With linear transportation costs (t), a consumer located at x receives the utility $u_1=v_1-p_1-tx$ and $u_2=v_2-p_2-t(1-x)$ when buying from firm 1 and firm 2 , respectively. For simplicity, we normalize transportation costs to one ($t=1$). Given the above assumptions on market coverage, we then have the following demand:

(2) $D_i = \frac{1}{2} - \frac{p_i-p_j}{2} + \frac{\Delta_i}{2},$

where $i,j=1,2$, $i{\neq}j$, and $\Delta_i = v_i - v_j$. Here, v_i is the (vertical) intrinsic quality of the product offered by firm i. In contrast to Foros and Kind (2017), we allow the firms to be asymmetric at the outset. With no loss of generality, we assume $\Delta_1 \geq 0$. Profit for firm i is thus

$$(3) \qquad \pi_i = [p_i - (c - \beta X_i)]D_i.$$

We compare two regimes (backward integration and a competitively neutral distribution system). Under backward integration (B), each firm operates its own distribution network, in which case $X_i^B = D_i$. Without backward integration, distribution is taken care of in a competitively neutral system (N) such that $X_i^N = D_i + D_j$. The competitively neutral system may be interpreted as a structure where an arm's length supplier provides distribution at equal terms of trade to both retail chains.

Firms decide prices simultaneously, and it is straightforward to show that we have the following equilibrium prices

$$(4) \qquad p_i^N = 1 + c + \frac{\Delta_i}{3}$$

$$(5) \qquad p_i^B = 1 + c - \beta + \frac{\Delta_i(1-\beta)}{3-2\beta}$$

From equations (2) and (3), we find that both firms' prices are lower under backward integration than under a competitively neutral system; i.e $p_i^N > p_i^B$. Therefore, consumers benefit from backward integration, despite the fact that both firms actually have higher unit and marginal costs. To see the latter, note that without backward integration, both firms face the unit costs c-β. Under backward integration, unit costs are given by $C(D_i) = c - \beta D_i$, where $D_2 \leq D_1 \leq 1$. We can thus state:

Proposition 1: *Consumer prices are lower under backward integration than under a competitively neutral system ($p_i^N > p_i^B$) even though marginal costs are higher.*

The reason why prices are lower in the "high cost regime" (B), is that size matters for pricing; a result shown more generally by Foros and Kind (2017). Firms behave more aggressively in retail pricing under backward integration when size matters. The more consumers a firm captures, the lower costs it will have relative to its competitors, other things equal. This effect is not present in a competitively neutral distribution system, where the firms face the same distribution cost function.

Since size matters for pricing, firms may have different incentives to integrate backward. The reason for this is that firm *i* achieves a competitive advantage over firm *j* with backward integration if $\Delta_i > 0$. In this case, firm *j* would obviously prefer the competitively

neutral system. In contrast, firm *i* may prefer cost-enhancing backward integration even though it will have higher costs than with the competitively neural system. To see this, assume that the choice of distribution format (backward integration or not) is undertaken prior to the firms' decision on retail pricing. Furthermore, assume that firm 1 (recall $\Delta_1 \geq 0$) has a decisive influence on the business format. This is a reasonable assumption, since the competitively neutral system (direct distribution, for instance) may become unprofitable if the larger retailer leaves the system. If so, backward integration arises if $\pi_1^B - \pi_1^N \geq 0$, and we find the following result:

Proposition 2: *There exists a critical value of* Δ_1 *such that if* $\Delta_1 \geq \Delta_1^{crit} > 0$, *then* $\pi_1^B - \pi_1^N \geq 0$, *and firm 1 prefers backward integration.*

Proof of Proposition 2 is given in the appendix.

Even though backward integration both makes the firms more aggressive and increases costs, firm 1 will thus take care of distribution on its own rather than use the competitively neutral system if its intrinsic quality is sufficiently high compared to that of its rival. The reason is that firm 1 gains a competitive advantage, and that this effect dominates. *The aim of the present paper is to investigate whether this effect is accentuated in managers' views on the effect of backward integration.*

An important lesson from this simple model is that a sole focus on cost efficiency may be misleading when evaluating the total welfare effects of backward integration. In the stylized model above, backward integration reduces cost-efficiency since both firms face higher costs than under a competitively neutral system. Nevertheless, consumers face lower prices.

3 Exploratory study of managers' views
3.1 Methods
3.1.1 Aim
To understand the driving forces behind large grocery chains' initiative to backward integrate into distribution, we interviewed industry participants at both the retail chain and the supplier level in the Norwegian grocery market. The purpose was not to formally test various theories behind backward integration, but to gain knowledge about industry participants' views on

what are the driving forces behind the observation that the largest retail chain(s) initiate backward integration. One important issue in this respect was to investigate the degree of consensus among industry participants from the supplier side of the market and participants from the retail chain level. Furthermore, we wanted to investigate whether there are differences in the views of small and large players.

While our main objective was to uncover whether a transition from a competitively neutral system for the retail chains is motivated by efficiency enhancing effects and/or by gaining a competitive advantage over smaller retail rivals, we had an open approach in the interviews in order to avoid biasing the participants' weight on these issues.

3.1.2 Design

We undertook a qualitative descriptive design (see Saunders et al., 2016), where content analysis was used to analyse in-depth interviews of executives of the Norwegian grocery industry. Norway is a picture-perfect market to analyse, since we have recently observed that the largest retail chain has taken the initiative to backward integrate into distribution. Until recently, the system was competitively neutral in the sense that arm's length third-party players took care of distribution.

Due to high customs barriers, the potential competition from foreign suppliers and retail chains is limited in the Norwegian market. Consequently, the market players at both retail and supplier level are easily defined.

3.1.3 Participants

The participants consist of industry participants at an executive level in the Norwegian grocery market. Participants are categorized as either smaller supplier, larger supplier, smaller retail chain, larger retail chain, or the market association. Final sample size for the study is ten informants, consisting of four larger suppliers, three smaller suppliers, one smaller retail chain, one larger retail chain, and one market association.

Informants have been guaranteed anonymity so that no names will be reproduced in the article. However, it is important to accentuate the informants' positions (i.e. supplier, retailer, small, large) when we present the main findings. This is to illustrate that the key findings are based on contributions from all informants, and to show possible relationships between informants' role in the grocery market and their opinions. Quotes from interviews

are therefore marked in accordance with the category to which an informant belongs. The four larger suppliers are denoted respectively larger supplier 1, larger supplier 2, larger supplier 3 and larger supplier 4, and similarly for smaller suppliers (smaller supplier 1, smaller supplier 2 and smaller supplier 3). When a category consists of only one participant, these informants are referred to in accordance with their category name; smaller retail chain, larger retail chain or market association.

3.1.4   Data collection

We used a semi-structured interview guide and the interviews were conducted individually. All interviews were undertaken by two of the authors (Bernes and Flo). Nine interviews were conducted in personal meetings, while one was conducted by telephone. Interviews were audio-recorded and lasted between 50 minutes and four hours. The interviews were undertaken in March and April 2016.

3.1.5   Data analysis

Interviews were transcribed by two of the authors (Bernes and Flo). The relevant data consist of transcribed interviews and follow-up questions via email correspondence. The material has been thoroughly processed in order to identify frequently mentioned issues, effects, explanations and attitudes. Quotes from interviews are used to illustrate key findings.

3.1.6   Rigour

Participants differ with respect to their affiliation (retail chain level versus supplier level) and their size (small versus large firms). Therefore, the selection of participants contributed to variations in findings. Two of the authors (Bernes and Flo) read all the transcribed interviews in order to find consensus and representative quotations. Participants were asked to confirm the meaning of quotations used.

3.1.7   Ethical considerations

The study was approved by the NSD - Norwegian Centre for Research Data. The participants were informed about the study through mail and oral information, and were also informed that data would be treated with confidentiality. Audio-files were deleted when the analysis was completed.

3.2   Findings

3.2.1   Efficiency of supplier distribution versus chain distribution

The general impression from the interviews is that chain distribution tends to be efficiency enhancing (we use the term chain distribution instead of backward integration in this section, since this is the term used by the participants). In particular, chain distribution might be positive due to more concentrated and timesaving deliveries of goods to the stores. The quote below (smaller supplier 1) illustrates how informants typically explain this:

> *"[Outlets] get a single delivery with everything they need, when one vehicle arrives instead of ten."*

Several informants also highlight how chain distribution may enhance efficiency due to higher load factor of vehicles. One of the informants (the smaller retail chain) puts it as follows:

> *"The transition to more chain distribution results in a more efficient distribution. Partly because this gives a higher load factor of the vehicles."*

Interestingly, it was also claimed that retail chain distribution might be particularly beneficial for smaller suppliers, because suppliers must be of a significant size in order to obtain satisfactory load factor of vehicles under direct distribution. One informant (larger supplier 4) states the following:

> *"I think you have to be very large as a supplier to fill a full car in order to distribute in a cost-effective manner."*

Overall, there is consensus among the informants that it is not efficient that all suppliers operate their own distribution. However, the larger retail chains are in a better position to capture efficiency gains from own distribution than their smaller rivals. In the same vain, it appears from interviews that large suppliers are able to achieve cost-effective direct distribution. One of the informants (larger supplier 1) explains:

> *"The consequences of chain distribution will primarily be negative for suppliers that are large enough to distribute directly."*

We will come back to the size issue, particularly on the retailer side of the market, when we discuss bargaining below.

3.2.2   Product range/variety at the store level

Several of the informants point out that chain distribution does not affect the product range in stores directly, at least not in central areas. The smaller retailer claims the following:

"Competition between the chains will determine which products we will find in stores»."

In contrast, the larger retail chain claims that chain distribution may contribute to a more optimal product range in stores, but emphasizes that product variety need not increase:

"With information on retail sales and frequent delivery, we ensure that the right product is in store at the right time."

One larger supplier (larger supplier 4) claims that more chain distribution may increase the degree of product range standardization within a given chain, because store managers may lose some of their freedom to bring in products from local suppliers that come to the "door" with their products. Another larger supplier confirms this view (larger supplier 1)

"The effect of more chain distribution will be that retailers [within a given chain] are more and more identical, regardless of where the store is located."

Several of the informants claim that the transition to chain distribution may improve assortment in stores in rural districts. Two suppliers (respectively larger supplier 4 and larger supplier 1) explain:

"The transition into chain distribution will affect our ability to reach customers with our products. For small stores in rural districts, it was too expensive to cover them with our own distribution. "

"The transition into chain distribution meant that our products could be distributed to stores in districts where it would otherwise not be profitable."

Several informants make similar statements, where the larger retail chain explains:

"Chain distribution enables district stores to get a larger product range, more efficient delivery, lower costs and more frequent ordering opportunities."

To summarize, informants maintain that chain distribution does not directly affect the product range, but that an increased degree of chain distribution may lead stores within any given chain to become more standardized. As a corollary, they claim that the transition to more chain distribution can have a positive impact on regional stores' product range.

3.2.3   Bargaining

The participants share the view that the largest vertically integrated retail chain (NorgesGruppen, hereafter NG), through its procurement and distribution unit (ASKO), has been a driving force towards more chain distribution. However, there is some disagreement with respect to NG's main motivation for backward integration. Some participants accentuate that an advantage for NG was due to development of infrastructure. One informant (smaller supplier 2) explains:

> *"Those who have the best infrastructure will benefit most from the transition to chain distribution, and NG has been at the forefront. NG invested early in technology, infrastructure and logistics solutions."*

Several informants make similar statements.

The majority of the participants argue that there is a close link between bargaining power and the incentives to increase the degree of chain distribution. One of the informants (smaller supplier 2) expresses:

> *"It may well be that chain distribution is more efficient, but it also involves the fact that chains achieve more bargaining power and increased profits."*

The following quote from the market association gives a good picture of the general perception among the interviewees:

> *"The larger you are, the more buyer power you achieve, and so you can demand better conditions than other market participants."*

The larger retail chain emphasizes the following:

> *"We choose to believe that when you have the largest procurement you can also expect to get the best price."*

Several informants express similar views where they emphasize that it is the largest vertically integrated retailer (NG) that achieves the best procurement conditions. Smaller supplier 1 and larger supplier 1 express the following, respectively:

> *"When NG enters negotiations with e.g. Orkla (a large supplier), they say "we are the largest, we will have the best conditions", and so they do."*

"NG can, because they are the largest, achieve better conditions with the major national brands. This can be seen by how NG obtains better conditions with well-known national brands, while smaller vertically integrated chains, such as Rema, have to resort to more EMV (private labels) in order to obtain benefits."

Thus, the overall perception is that larger vertically integrated chains have more buyer power and can thus negotiate better conditions than other players.

3.2.4   Effects on entry

3.2.4.1   Suppliers

All informants express the view that the transition to chain distribution may be positive for small suppliers. The following quote from the market association represents the typical perception among the interviewees:

"If you are included in the vertically integrated retail chain's systems you have the potential to reach nationwide. Which is a very significant advantage."

There seems to be consensus among the informants that chain distribution may be beneficial for smaller suppliers as it may improve their distribution capabilities. Nevertheless, it is emphasized that obtaining access to the chain systems may be a challenge.

3.2.4.2   Retailers

Informants agree that chain distribution acts as a barrier to entry at retail level. The market association expresses the following opinion:

"This is the most important entry barrier in the Norwegian market. New, independent stores become dependent on access to established chains' distribution networks. Missing transparency regarding pricing models increases the likelihood of goods and distribution being priced so high that new entries to the market will be unprofitable."

One of the larger suppliers (larger supplier 2) claims that it is challenging for the new entrants at retail level, since there are no independent providers of distribution. The smaller retail chain claims that it is important that a potential entrant can choose among several distributors:

"It will still be possible for smaller chains to establish themselves, but the premise is that there are a certain number of distributors to choose from for the smaller chains."

The same informant believes that competition to provide access for smaller retailers is crucial; if not, the informant claims that the large retail chains would capture higher margins.

Competition among the vertically integrated retail chains to provide access to distribution for entrants and smaller retailers will reduce margins captured at the distribution and procurement level. One of the smaller suppliers (smaller supplier 3) states the following during the interview about the likelihood of new entries:

"I believe that the transition into more chain distribution will make establishment harder at the retail level."

The larger retail chain is the only one of the ten interviewees who claims that the chain distribution will not affect the ability of players to establish themselves at the retail level.

Overall, we see that there is consensus (with the exception of the large retail chain) among the interviewees about the existence of significant barriers to entry at the retail level in the Norwegian grocery market, and that more chain distribution will further increase such barriers at the retail level.

3.2.5 Effects on competition between larger and smaller retail chains?

The distribution function constitutes a decisive factor in the overall competitive landscape of the three vertically integrated retail chains. The larger retail chain says the following:

"Today, the retail chains compete in procurement and logistics, as well as operating the stores. The one with the best procurement and distribution unit will win; it is a constant struggle for improvements and efficiency."

Several informants emphasize that size is a crucial element. The quote below (from larger supplier 1) illustrates this:

"The one who benefits the most from the transition towards more chain distribution will be the biggest player, due to economies of scale. The load factor of vehicles is crucial here; small differences can have a big impact on the overall margins. The difference between a 60% and 80% filling rate can have a major impact in the end. [...] The largest vertically integrated retail chain will achieve the lowest cost."

Several informants emphasize that in particular NG has a size advantage when it comes to the operations at the wholesale level (procurement and distribution). Two of the informants (respectively smaller retail chain and smaller supplier 1) accentuate the following:

"The largest retailer will benefit the most from the transition into chain distribution, i.e. NG."

"[All retail chains] will probably gain from the transition to chain distribution, but especially NG, as the largest player. It's the size that matters."

A couple of informants explain in detail how the distance from the wholesale warehouse to stores affects the vertically integrated chains' competitiveness. One informant (larger supplier 3) argues that transition to chain distribution distorts competition because one of the vertically integrated retail chains has greater storage density compared with the others. The informant explains the consequences as follows:

"If one player is better positioned to have lower costs, because of more warehouses and greater locational density of those warehouses [...] then what happens? Well, these warehouses become bigger and bigger."

The smaller retailer makes a similar statement:

"It will become more costly to distribute in rural areas, and the chain with the shortest path to its stores will have the lowest distribution costs."

Overall, we see that there is broad consensus among informants that NG has had an advantage, and that they probably have the most to gain from the development.

During the interviews, several informants stated that it would be better for competition if vertically separated independent players provided distribution. The following quote (from larger supplier 3) represents the typical standpoint by informants:

"By separating the stores from the distributor, the distributors will have to act more objectively, and perhaps provide more transparent prices to the chains."

Even though the interviews provide a general impression that independent distributors may improve competition, such a solution might nonetheless be inferior. Various informants believe that an independent wholesaler will have adverse effects on the supply chain as a whole, including at the retail level. The arguments are based on the view that a fully integrated solution will ensure better coordination between the players in the value chain. One of the informants (larger retail chain), emphasizes how an integrated value chain, with logistics

systems that coordinate transportation with shelf placement in stores, makes it possible to be more efficient.

3.2.6   Effects on consumer prices?

Since the respondents disagree on how chain distribution affects competition, they also disagree on how consumer prices are affected. However, the majority of the interviewees seem to believe that the price effects are small. The following quote (from small supplier 2) is characteristic of the informants' views:

> *"I believe that consumers will not suffer [...] The transition to chain distribution affects the bargaining power between supplier and retailer, but the end-user will not be affected*."

The smaller retailer believes that only a negligible part of any cost savings that might arise due to chain distribution will be passed on to the consumers:

> *"The transition to chain distribution will have no major effect on prices and product range in stores. It is the competition between the chains that determines what prices we find in stores."*

Smaller supplier 3 likewise maintains that:

> *"Consumer prices are not reduced as the chains' distribution becomes more efficient, but it generates more profitability to the chains."*

Two of the informants (respectively larger supplier 1 and larger retail chain), however, emphasize that the transition to chain distribution will be positive for consumers. The following quote (larger supplier 1) illustrate their point:

> *"We believe that the consumers will take part in these gains, through cost savings and efficiency."*

Summing up, the interviews reveal conflicting views on how chain distribution affects efficiency and prices. One side argues that the backward integration ensures adequate coordination in the value chain, while the other side claims that backward integration hampers competition.

4   Discussion and conclusion

The initiative behind backward integration into distribution by the Norwegian grocery chains came from the largest chain, NorgesGruppen (NG). Consequently, our findings resemble observations from other grocery markets; in the US, the largest chain (A&P) initiated a similar development 100 years ago (Ellickson, 2016) and the current dominant retail chain, Walmart, is vertically integrated into wholesale activities (Holmes, 2001, 2011, Basker, 2007).

The majority of respondents in our survey emphasize that size matters, and that there are economies of scale in distribution. The respondents' views are therefore consistent with findings in econometric analysis (in particular Holmes, 2011). Holmes (2011) analyzes the dynamic store location choices of Walmart, and finds significant "density economies": Walmart prefers to save distribution costs by setting up new stores close to its established outlets even if this gives rise to cannibalization of sales. Likewise, our respondents indicate that the largest Norwegian chain, NG, gains similar advantages from having a higher density of stores and warehouses compared to its rivals.

An important question is whether the same efficiency gains could have been achieved within a competitively neutral distribution system. As accentuated in the Introduction, in principle a third-party firm may achieve the same economies of scale in distribution. However, digital distribution systems that interact closely with consumer and demand information at the store level may require closer vertical coordination. This could constitute an important rationale for the development towards more backward integration. Several of our respondents confirm this. At the same time, they emphasize that the largest retail chain benefits most from backward integration. If backward integration reinforces the importance of size in logistics and distribution operations, this may therefore intensify the competition for being the largest firm.

When the largest retail chain chooses to backward integrate, other retail chains may be forced to follow since it becomes too costly to continue with a competitive neutral system or direct distribution from suppliers. Respondents verify this, and the largest chain, NG, thereby controls a "veto" to implement industry-wide backward integration into distribution. This justifies our assumption in the theoretical model in Section 2.

Respondents are ambiguous when it comes to the effect of backward integration on retail prices and the degree of retail competition. Other things equal, if backward integration lowers all retail chains' unit costs, we should expect consumer prices to fall. Several studies show that size affects marginal costs in grocery markets. The UK Competition Commission (2008) made an econometric analysis of the UK grocery market, and found a significant negative relationship between size in procurement/distribution and wholesale unit costs. Basker (2007) and Ellickson (2016) argue that Walmart's success might largely be explained by size-advantages in wholesale activities such as logistics, distribution, procurement and backward integration into production. If Walmart increases volume by 10%, their marginal costs fall by 2% (Basker, 2007).

All participants in our study agree that the largest retail chain, NG, benefits most from the development. Scale effects create more efficient distribution (higher load factor, among others things) for large relative to smaller retail chains, and the majority of participants further accentuate that the largest retail chain also improves its buyer power through backward integration. Consequently, the findings are consistent with the conjecture from the simple theoretical model (Section 2) that for retails chains consumers are not just customers, they are also inputs used to reduce costs. Since the number of customers affects unit costs, this feature may intensify competition among the retail chains. It becomes more important to catch one more customer, since he or she may be used to gain further competitive advantage over rivals.[6]

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[6] This is an effect analogous to what we find in markets with positive network effects (see Farrell and Saloner, 1992, and Katz and Shapiro, 1985, among others).

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Appendix

Proof of Proposition 2:

From equations (1)-(5) in Section 2 we find:

$$(6) \quad \pi_1^B - \pi_1^N = \beta \left(-\frac{1}{4} + \Delta_1 \left(\frac{1}{6} \frac{1}{3-2\beta} + \frac{1}{36} \Delta_1 \frac{15-8\beta}{t(3-2\beta)^2} \right) \right)$$

First, note that if there is no size effect, β=0, firm 1 is indifferent between backward integration or not. In this case, if firm 1 chooses backward integration, this gives rise to a competitive advantage over firm 2 as long as Δ_1>0. However, under the spatial demand set up, firm 2 would reduce its price accordingly to nullify the profit effect. Obviously, this neutrality result does not survive under alternative demand specification, but it allows us to scrutinize the specific properties of the size effects of the present model.

Therefore, let us concentrate on β>0. We now observe that (6) is negative if Δ_1=0. Furthermore, we directly observe (6) is increasing in Δ_1 as long as β>0. The upper bound of Δ_1 is given by the value that forecloses firm 2 from the market; i.e. Δ_1=3-2β. Inserting for Δ_1=3-2β into (6) we have

$$(\pi_1^B - \pi_1^N)_{\Delta_1=3-2\beta} = \frac{\beta}{9}(3 - 2\beta) > 0$$

Consequently, there exists a critical value of Δ_1, such that if $\Delta_1 \geq \Delta_1^{crit}$>0, then $\pi_1^B - \pi_1^N \geq 0$, and firm 1 prefers backward integration. QED.

Large retail grocery chains' backward integration into distribution, procurement and production is controversial, and has received a lot of attention by both policymakers and market players. If a large retail chain for instance takes over scale intensive distribution activities from its suppliers, direct distribution from these suppliers to other retail chains might become more expensive (and might even initiate costly industry-wide backward integration). An interesting question is thus whether large retailers undertake backward integration mainly for efficiency reasons or whether they do so in order to gain a competitive advantage through raising the costs of the smaller rivals. Theory and econometric analyses are inconclusive. The current study uses a survey to investigate managers' views on this issue. The study is explorative, and thus does not formally test different theories, but our findings indicate that large retail chains' incentives to backward integrate are mainly related to efficiency rationales.