Concentration in the U.S. Grocery Retail Market and Leading Firms' Investment Activities

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1. Introduction

The strategies of marketing activities for suppliers that manufacture and sell goods are important in terms of how they sell their products. Unlike companies that can handle everything from manufacturing to sales themselves, manufacturers of fast-moving consumer goods (hereafter referred to as FMCG) almost always do not sell their products by themselves but sell them to consumers via retailers, or sell some of their products by themselves but most of them sell them to consumers via retailers. Therefore, it is important for them to determine which retailers they sell their products through. Therefore, FMCG manufacturers need to understand the retailer's sales volume, characteristics and sales methods, and develop a sales strategy that meets the characteristics of their products and their product sales targets.

Grocery retailers dealing with food products, including fresh, chilled and frozen foods, have undergone a major business shift in the last 20 years, and particularly in the last decade. This is the shift from simultaneity to asynchrony between the retailer's sale of goods and the shopper's purchase and receipt of goods. Specifically, it is a shift from in-store sales to omni-channel sales that include in-store sales and online sales. Online sales or online retailing is a type of E-Commerce whereby a business sells goods or services directly to consumers from a website. This is a major challenge for retailers themselves, and a major consideration for FMCG manufacturers who sell their products to retailers. While suppliers such as manufacturers and manufacturers' contracted sales and marketing agencies (SMAs) have been responsible for marketing and merchandising activities such as in-store promotions when it comes to selling products in stores, if the retailer focuses on the online retailing, such suppliers will have to change their activities to online-retail specifications.

As the sale of goods through online retailing progressed, a new form of business for retailers (Turban, King, Liang and Turban, 2012) and the profitability of subscription offerings (Belavina, Girotra and Kabra, 2016) were investigated academically. At the same time, researches on consumer behavior, such as consumers' use of in-store and online shopping (Haridasan, A.C. and Fernando, A.G. , 2018,), were also advanced. However, the research on the structure of online mail-order businesses (He, Mirchandan, Shen and Yang, 2021 and Yokoi, 2022), on what kind of mail-order business network should be established to achieve sustainable businesses, has started but is not yet advanced.

This study considers the U.S. market, a global leading market in online grocery sales, to organize the types of omni-channelization of grocery retailers and how they expand their networks, based on their investment behaviors in an increasingly top-centralized environment, and examines how the results differ depending on these types.

2. Concentration and firms’ activities

2.1 Present trend of higher concentration

Kastrinaki and Stoneman (2013) point out that changes in the high concentration in an industry can be caused by the growth of the firms themselves, market exits and mergers and acquisitions; Syrneonidis (1996) states that firms in highly concentrated industries can engage in innovative activities and concludes that the high concentration industries are the only ones in which the leading firms concluded that it is only the leading firms that actively invest in new activities. Cohen et al. (1987) also find that the leading firms in an industry are able to undertake innovative activities due to economies of scale and other factors.

Regarding the US grocery retail industry, the industry is highly concentrated: in 1992, the top four firms had a 16.8% share, the top eight firms had a 26.4% share and the top 20 firms had a 39.2% share (Figure.1). By 2016, the top four firms accounted for 42.4%, the top eight for 53.5% and the top 20 for 66.6%, with the top eight firms accounting for more than half of all sales and the top 20 for nearly 70%. While not quite an oligopoly, the fact that the top eight firms account for more than 50% of the market share indicates a high degree of concentration at the top.

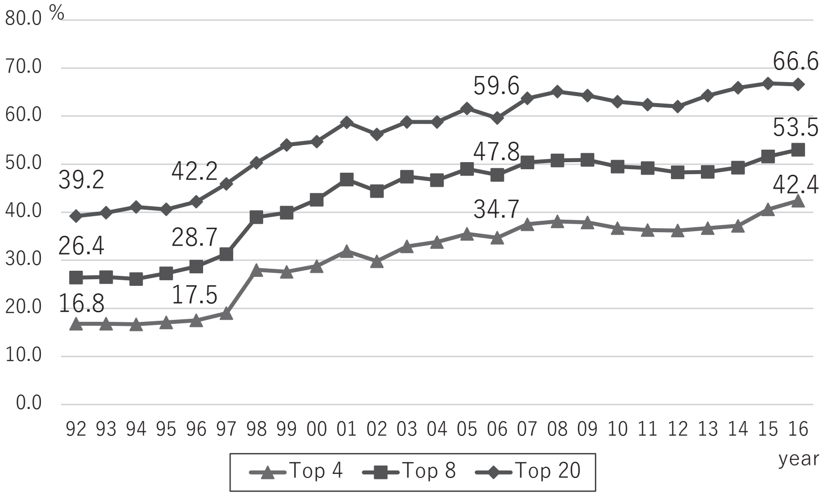
One reason for the concentration is the growth of the company itself, as in the case of Walmart, and another is the mergers and acquisitions that many U.S. foodretailers have undertaken. Kroger, the second largest grocery retailer by revenue, has expanded its sales size and sales area in the last decade as well, acquiring regional retailers Harris Teeter in 2013 and Roundy’s in 2015. In addition, both Royal Ahold USA and Delhaize USA were among the top ten sales companies in the US grocery retail market, but the merger between the parent companies in the Netherlands and Belgium in 2016 resulted in the two companies merging in the US market to become Royal Ahold Delhaize USA (hereafter, referred to as Ahold Delhaize). In another example, Albertsons, once the number one supermarket company in the country in terms of sales, collapsed in 2006 and was restructured by an investment company. Following the turnaround, the company acquired regional retailer United Supermarket in 2013 and Safeway, the fifth-largest grocery retailer by sales, in 2015, and has since returned to its current position. Thus, the higher concentration has developed as companies have grown through their own growth and mergers and acquisitions, which have led to some companies losing out to competition, withdrawing from the market or being acquired.

In order to become a top-tier firm in terms of turnover, the firm must then continue to grow its turnover. As retailing is an industry where economies of scale are important, such as purchasing goods in large numbers in bulk and selling them at low prices, leading retailers have achieved their large sales scales by increasing the number of shops and expanding the area they sell in.

2.2 Innovative activities in leading firms

Leaders’ firms have actively invested in innovative activities, as noted in existing studies. For example, Leaders’ firms have encouraged the development of business-to-business commercial transactions through e-commerce, as evidenced by Vijayasarathy and Robey (1997) and Leonard and Davis (2006), who have conducted research on improving efficiency through the introduction of IT in business-to-business commercial transactions. This has included the promotion of Electronic Data Interchange (EDI), whereby computers are networked and voucher

Figure.1 The series ratios of the top 4, 8, and 20 retailers in the grocery retail market



Source: USDA Economic Research

information is converted into electronic data to be shared with suppliers in order to improve procurement efficiency. This is driven by collaboration with suppliers, such as manufacturers, with whom retailers do business. For suppliers as well as retailers, EDI enhances the efficiency of transactions and reduces the time lag between when consumers want a product and when they can get it. EDI is also an innovative activity that has made significant progress in terms of marketing strategies. Leading retailers have also invested in capital investment to reduce administrative costs, improve the utilization of distribution centers and reduce procurement costs through bulk purchasing in large volumes, as well as to improve profitability by reducing costs and improving operational efficiency.

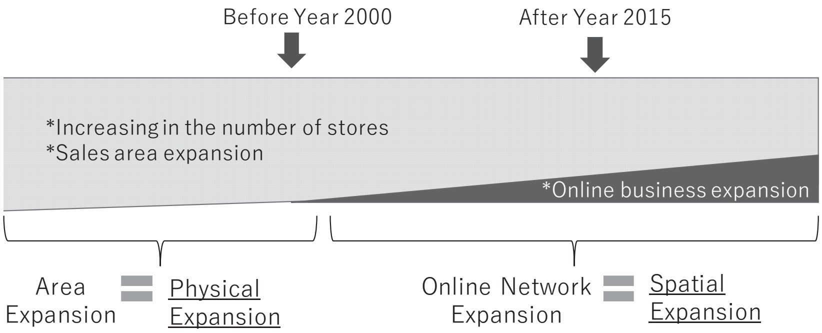
2.3 Change in innovative activity - from physical to spatial expansion

Leaders' firms, which had been innovative in increasing the number of stores and reducing costs, began to be innovative in strengthening their online operations from the 2000s onwards. In the first place, the emergence of specialized online retailing in the early 1990s, due to advances in information technology, led to the entry of existing physical retailers, Brick-and-Mortal retailers (hereinafter hereafter, referred to as B&M retailers) into this business.

There has been a shift in the strategy for B&M retailers in expanding their scale of operations. The shift is from physical to spatial scale expansion. As mentioned earlier, retailers have been referring to physical scale expansion, where retailers increase the number of shops and expand the area of sales. However, in the 2000s, as Berman and Thelen (2004) state, B&M retailers also started to sell online, as the retailers expected higher sales and profits. This is not an expansion of the physical area, as in the past, by increasing the number of stores and sales areas, but a spatial expansion of scale, extending the network of e-commerce.

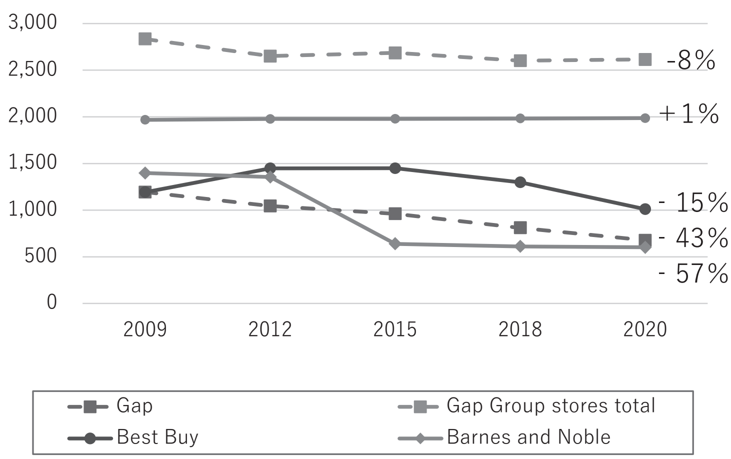
This shift from the physical to the spatial changes the business model in the retail industry fundamentally (Figure.2).

Figure .2 Changes in retail expansion strategies



Source: Author

Figure.3 Number of stores in major non-food retailers from 2009 to 2020



Source: Companies' annual reports

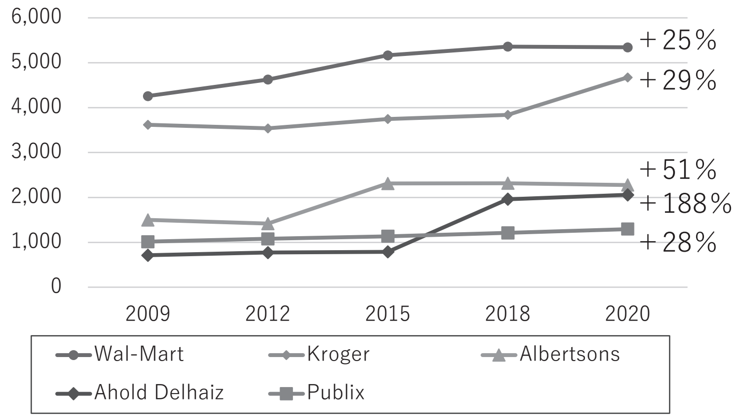
Although mail order businesses without physical stores have existed for a long time via catalogues and the like, the goods sales market has largely been dominated by store-based sales. However, the current breakthrough of online retail business is now forcing bookstores and apparel shops to close their doors worldwide.

Indeed, a comparison of store counts between 2009 and 2020 for the leading retailers in the US in the non-food sector in terms of sales shows that, while home improvement retailer Home Depot saw positive growth, albeit only by 1%, bookstore Barnes & Noble saw a 57% decline, apparel retailer Gap saw a 43% decline (down 8% in terms of total group stores), and consumer electronics retailer Best Buy was down 15% (Figure.3). And as they have reduced the number of shops, they are redirecting assets to their online retail business.

2.4 Grocery retailer's strategy to increase the number of stores

In contrast, compare the number of stores in 2009 and 2020 for the five leading retailers in the US grocery retail

Figure.4 Number of stores in major grocery retailers from 2009 to 2020



Source: Companies' annual reports

sector as of 2020 (Figure.4). The top-ranked Walmart has increased by 25%, and the other companies have increased by more than 20% (Ahold Delhaize and Albertsons have significantly increased their figures by 188% and 51%, respectively, due to major mergers and consolidations over the last decade, but they have not reduced their stores significantly since then).

There are several reasons why grocery retailers increase the number of stores, mainly due to the consumer demand and the retailer operational efficiency. The consumer demand means what consumers are looking for when purchasing food products. Kim and Forsythe (2010), Kushwaha and Shankar (2007) and Chocarro, Cortinas and Villanueva (2013) found that consumers preferred to shop for 'experience' products such as food and apparel, where the value cannot be judged without actually purchasing the product, than 'exploratory' products, such as electrical appliances, where the specifications can be researched in advance and the value can be judged. There is a consumer group that wants to buy at least some food products with their own eyes, and therefore retailers need to respond to this and maintain or increase the number of stores. Another is the efficiency of retail operations. This is because non-food retailers, such as consumer electronics retailers, are based on shipping products from warehouses in response to consumers' online orders, whereas grocery retailers are mainly store-based, delivering products from warehouses to stores in response to online orders before delivering them to consumers. Yokoi (2017) points out that many supermarkets, which are the primary grocery retailing format, handle 60% of their products as perishables, and that their geographical area is so large that four time zones have been set up in the USA. Therefore, in the online grocery retail business, which handles perishables and refrigerated foods, it is difficult to distribute products directly from distribution centers to consumers in many areas, and it is more efficient to ship products for online shopping from the warehouse to the retail stores and then sort online orders to consumers in each area. In addition to delivering products to consumers' homes, they also offer so-called Click & Collect, whereby consumers can pick up products at the shop or at a location near the shop (Curbside), providing them with a service that allows them to pick up products at any time and reduces the cost burden of delivery, while also saving the retailer the hassle of delivery itself. The retailers themselves are also able to realize efficiencies in terms of delivery.

For a grocery retailer, therefore, investing in innovative activities in the online mail-order business is not a simple matter of shifting from increasing the number of shops and sales areas and the associated operational efficiencies to investing in the E-Commerce business B& M retailers, The need not only to develop its online retail business, but also to integrate it with its existing stores - the so-called omni-channel approach - meant that it had to capitalize on new innovative activities to integrate and develop its shop and online retail business.

3. The grocery retail market in the US

3.1 The development of online grocery retailing

The early online operations of leading retailers were Walmart and Ahold Delhaize (then Ahold USA), which started in 2000, and Ahold Delhaize, which acquired Peapod, an Online Grocer start-up, and was the earliest online grocery retailer in the USA. However, they operated in a very limited area. Walmart's product range was for processed and non-food items, with no perishables or refrigerated or frozen foods. Co-operative chain Wakefern began home delivery of groceries in 2002, although the relevant area is small. Albertsons also started e-commerce in the early 2000s, but also did not offer perishables or refrigerated foods. It was more than a decade later that online food retailing, including fresh, chilled and frozen food, began to take off in earnest.

The development of the e-commerce business for grocery retailing, including fresh produce, has three phases, resulting from the events of 2017, 2013 and 2017. The first phase was the awakening of leading B&M retailers to food online due to the entry of Amazon.com (hereafter referred to as Amazon), which was an e-commerce specialist retailer at the time, into grocery sales. Amazon had been selling processed foods, but in 2007 it launched Amazon Fresh, a business that delivers fresh and frozen foods to homes and other locations, in its home base of Seattle, Washington. There have been other start-ups that have ordered and delivered fresh produce online before, and Ahold USA (now Ahold Delhaize) had an online business, but they were all small businesses that catered to consumers in a very limited area. Walmart had sold non-food and processed foods online, while fresh, chilled and frozen foods were limited to in-store sales. However, Amazon's full-scale entry into the online grocery business caused Walmart to invest rapidly in online ordering and delivery of perishable products.

The second phase was in 2013-2014, when B&M retailers began experimenting with and investing in online grocery shopping. In 2013, Amazon concluded its Amazon Fresh experiment and began to roll out its grocery online shopping in Los Angeles, California, and other areas of the country. Walmart finally began to pilot grocery orders and delivery via online in Denver, Colorado. Also during the year, Kroger invested to strengthen its online business by acquiring Harris Teeter, a regional retailer that had a strong online e-commerce business. It should be noted that Kroger piloted its grocery online business in 2015, after entering the online retail market in 2013. And in this second phase, some of leaders' firms, which does not have its own online site, entered the grocery online shopping market by way of a partnership. Specifically, they have formed a partnership with Instacart or Shipt or both, which offer same-day grocery delivery and pick-up service for retailers and consumers, to have their retailer's products and have consumers order products from these platforms. A dispatcher from the delivery service firm would then go to the retailer's shop in the area closest to that consumer, purchase the goods on the consumer's behalf and deliver them. This means that the retailer does not need to build its own online site and does not need to strengthen its distribution centers or delivery for online sales. This was the fastest way to catch up with the frontrunners who had built their own sites first and had experience in online retailing, and the fastest way to get ahead of the competition.

The third phase occurred in 2017, when Amazon's acquisition of B&M retailer Whole Foods Market occurred. Amazon expanded Amazon Fresh operations to metropolitan areas in 13 states and Washington, D.C. (Washington, D.C.) by spring 2017. However, it was difficult to deliver fresh and frozen food products at the time consumers wanted them without a shop.

As Yokoi points out (2017), Amazon is not able to deliver perishable products to consumers immediately, unlike non-food products or processed foods that last longer, where products are stocked in warehouses for a certain period of time and then delivered from there over time. This is why, in June of the same year, the company announced the acquisition of Whole Foods Market, which operates 400 stores across the US. This led to intensified competitiveness in the US food retail industry for online shopping, including for perishable products, and the larger companies strengthened their online retailing structures. Around this time in 2017, companies invested through various acquisitions and partnerships. For example, Walmart acquired a delivery company in 2017 and decided to partner with Google; Kroger partnered with UK online-only retailer Ocado in 2018; Albertsons and Ahold Delhaize partnered with Take Off, which develops automated warehouses, in 2016 and 2018 respectively, and have invested significantly to introduce automated warehouses that automatically take orders and pick goods for online shopping for perishable and included goods.

3.2 Types of online retail development and expansion

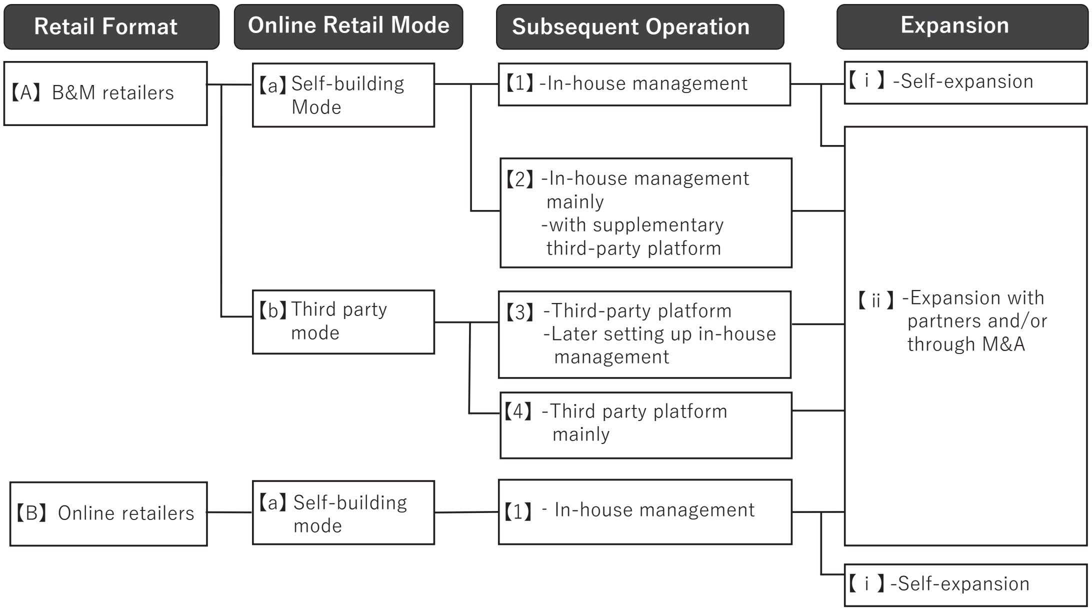
There are seven patterns of online grocery retail business development. This patterning is based on the original retail format type (A or B), the type of online business entry (a or b), the type of operation after the start of online business (1 to 4), and the method used to expand the business (i or ii) (Figure.5).

Pattern 1 (A-a-1-i): Not applicable for the main grocery retailer's current online business
Pattern 2 (A-a-1-ii): Not applicable for the main grocery retailer's current online business
Pattern 3 (A-a-2-ii): Self-development to the extent possible
Pattern 4 (A-b-3-ii): Self-development later
Pattern 5 (A-b-4-ii): Third-party utilization
Pattern 6 (B-a-1-ii): Online specialist
Pattern 7 (B-a-1-i): Not applicable for the main grocery retailer's current online business.

First, as dedicated online retailers and B&M retailers have different starts in online business development, the two are divided by retail format. Then, they are classified according to how they have built their online business. The two are further classified according to how they have structured their platform, which serves as a point of contact with consumers. In addition to the platform, the network is also classified as a necessary, expanding and developing element of the online retail business, such as supply chain and warehouse management, and is divided according to how it is expanding.

Excluding cases that a retailer has been acquired by a B&M retailer, the online-only retailer by Retail Format currently refers to Amazon, which obviously has its own online business and its own platform, as it started out as an online-only retailer. In network expansion, it has acquired stores and now has delivery points to consumers.

Figure.5 Types of grocery online business development



Source: Author

Next, B&M retailers can be divided into two main types when starting an online business: self-building and third-party mode. Retailers that choose the third-party mode do not build their own platforms, but use third-party platforms. In this mode, a third party such as Instacart substitutes the entire process from the receipt of the retailer's order to the delivery to a customer for the retailer. The retailer do not need to build its own delivery and other mechanisms.

Regarding operations after entry into the online business, all self-building mode retailers can be divided into two main categories: self-built platform operations and the use of third-party platforms as a supporting factor for self-built platform operations. The latter is the partial use of third-party platforms in order to meet consumer demand for products that cannot be offered to consumers in all areas of the large US market through online shopping using a self-built platform, or in order to obtain products more quickly after ordering. In the past, Wakefern operated entirely in-house, but now they partly utilize third-party platforms, and therefore all leaders' firms are of this latter type. It is possible that in the future, leaders' firms may become exclusively In-house platforms, but at present they are of the latter type.

In the third-party mode retailers, there are two types of retailers: those that mainly use third party platforms, and those that used to use third party platforms but have built their own platforms to catch up with leading retailers and use them in combination.

As for network expansion, there are two types of expansion: self-expansion and expansion through cooperation with partners and M&A. Currently, even the leading retailers are not self-expanding everything, but are working with technologically superior partners to build advanced distribution centers for online shopping, and to introduce automated order picking and automated warehousing.

Applying this to leading retailers with online grocery sales, we see the followings.

Pattern 3 (A-a-2-ii): e.g., Walmart, Kroger, Albertsons, Ahold Delhaize, Wakefern
Pattern 4 (A-b-3-ii): e.g., H.E. Butt
Pattern 5 (A-b-4-ii): e.g., Publix, Meijer
Pattern 6 (B-a-1-ii): e.g., Amazon

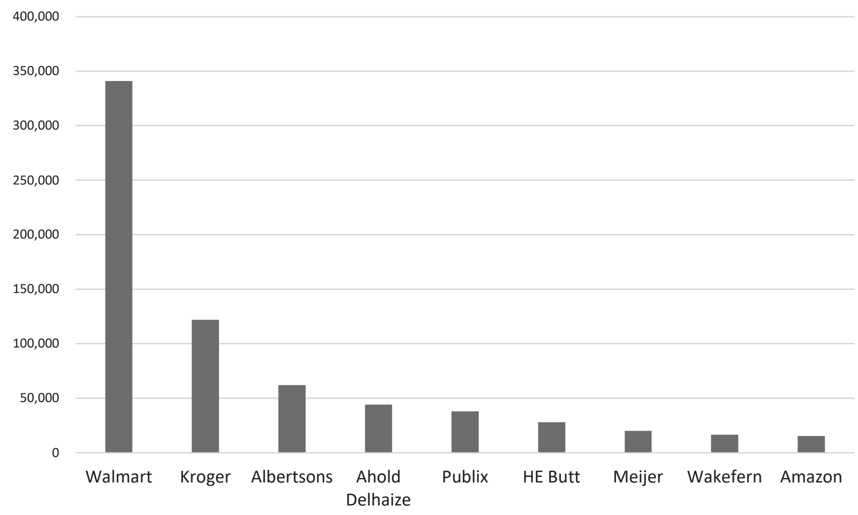
4. Investments in online businesses and their outcomes

4.1 Performance of online retail businesses

This section examines the results of the online grocery retail businesses of B&M grocery retailers and Amazon. Figure 6 shows B&M's major retailers and Amazon, which launched as an exclusive online retailer, in order of their 2020 grocery sales. The following section discusses the online grocery retail performance of these nine companies.

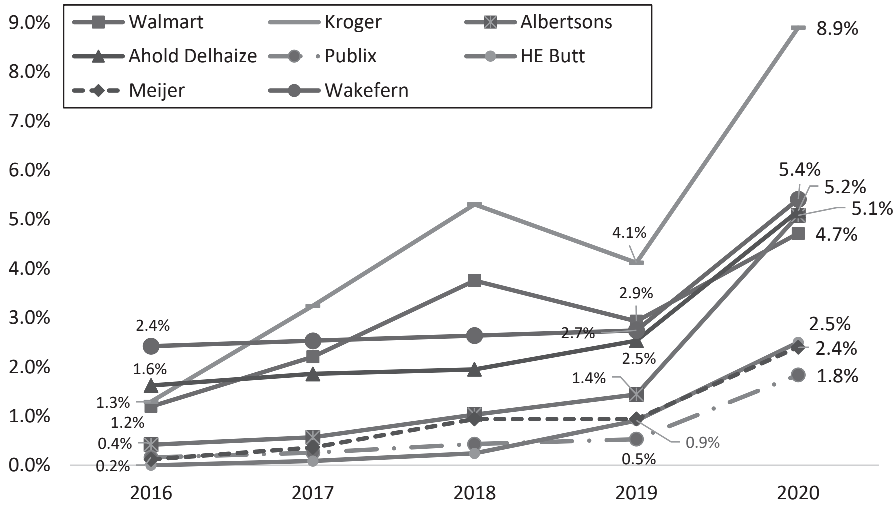
Figure.7 shows the ratio of sales via online to total grocery sales for B&M retailers from 2016 to 2020.Figure.8 shows the ratio of sales via online to total grocery sales for Amazon. In 2020, the global Covid-19 infection spread, which led to an increase in the number of online shoppers who used online shopping for non-in-person contact. This has led to a significant increase in the percentage of online sales for grocery retailers, which has doubled to quadruple over the previous year. Kroger, Walmart, Wakefern, and Ahold Delhaize have the identical ratio exceeding 2% by 2019. These companies have the ability to grow the same ratio from the high 4% range to the 8% range by the 2020 year of the Covid-19 infection; Kroger has the highest online sales ratio (8.9%), excluding

Figure.6 Grocery retail sales by leading firms in 2020 (million US dollars)



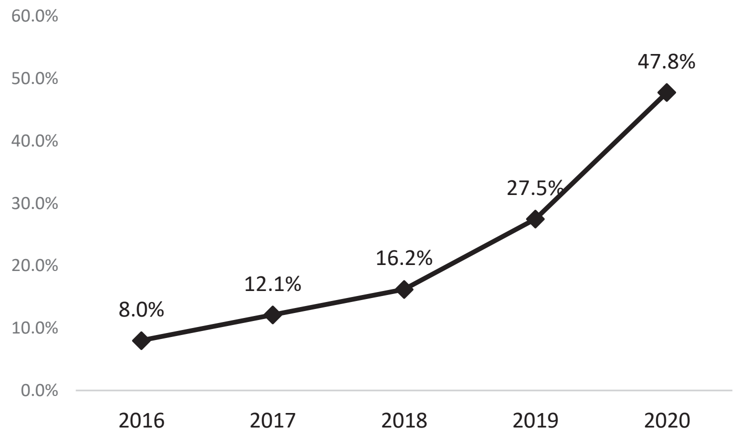
Source: Companies' annual reports and IGD research data

Figure. 7 Online sales as a percentage of grocery sales by retailers (2016-2020)



Source: Companies' annual reports and IGD research data

Figure.8 Amazon's online sales as a percentage of grocery sales (2016-2020)



Source: Companies' annual reports and IGD research data

Amazon. Kroger has been investing aggressively in its e-commerce business, including partnering with U.K.-based online retailer Ocado in 2018 to introduce an automated fulfillment warehouse that can instantly fulfill online orders. Albertsons, which jumped to 5.1% in 2020, had a lower ratio than its competitors at 1.4% until 2019. Compared to the previous four companies, it was the slowest to enter grocery online through its own website in 2016. However, by 2020, the ratio will catch up with the previous four company.

H.E. Butt, which has 2.5% of the same ratio in 2020, began operating its own online website selling cakes in

2012, but did not deliver to customers and limited it to store pickup. The company later increased the number of products it sold online, but did not offer delivery, limiting pickup to stores or curbside. The company began selling online, including delivery to customers' homes, in 2014 by using a third party. It was not until 2018, when it acquired a delivery service company, which it began to take responsibility for online ordering and delivery through its own website. As a result, the company was slower to strengthen its business compared to the previous five companies. Since then, the company has been strengthening its business by putting the president of the acquired company in charge of its own technology and establishing a digital technology center, and the effects of these efforts are being seen from 2019 onward.

Publix, the fifth-largest grocery retailer by sales, has been a late entrant. Contrary to competitors that have started selling grocery through their own online sites, Publix partnered with Instacart in 2016 to enter online sales through the use of a third-party platform, but has been limited to that platform. Meijer similarly partnered with third-party Shipt to sell online. The company has since partnered with Takeoff, an advanced automated warehouse developer and provider to Ahold Delhaize and Albertsons, to enhance its expansion, including the introduction of an automated warehouse in 2019. This is likely what led to the online sales percentage gap with Publix in 2020.

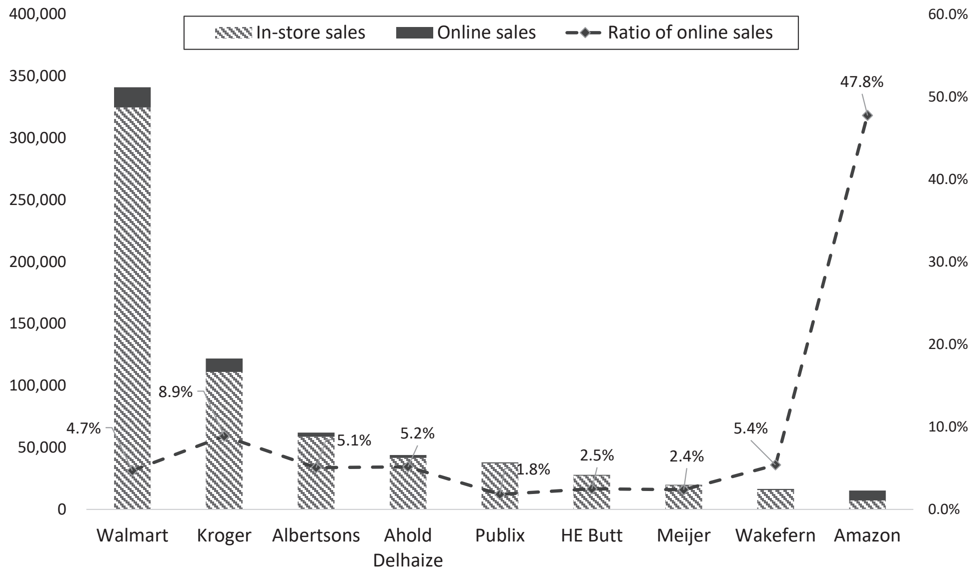
Amazon, after acquiring Whole Foods Market in 2017, has strengthened its store-based grocery online business and increased its online sales as a percentage of total grocery sales to nearly 50%.

In Figure 9, the total in-store and online sales of each grocery retailer in 2020 are shown, as well as the ratio of online sales to total grocery sales. Figure 10 shows online sales. Walmart's ratio of online sales in 2020 is slightly lower than that of Kroger and other competitors, but this is because Walmart has significantly more in-store sales than its competitors. In fact, it has the highest gross sales via online of these nine companies. Kroger, which has the highest ratio of online sales in 2020 excluding Amazon, is second to Walmart in total online sales and also has the second highest online sales. Although Kroger was late to enter the online business itself, acquisitions and a partnership with Ocado, a leader in the online business, helped it to rank second in gross online sales in 2020. While ranking fifth in terms of total sales, Publix settled for a lowly eighth place in terms of gross online sales. The low percentage of online sales correlates with low online sales. Wakefern, which is second lowest to Amazon in total sales and lowest among B&M retailers, is sixth in online sales only, more than Publix, H.E. Butt, and Meijer. The high online sales ratio correlates with high online sales.

Finally, Figure 11 shows the number of stores that carry each retailer's groceries and their online sales to sales ratio. Amazon, which has increased its online sales ratio to 47.8% by utilizing its 662 stores as a sort of distribution center, is remarkably high compared to its competitors. Amazon is a retailer that has originally specialized in online retailing, and this is a result of the company's ability to leverage its strengths. Walmart, which has the largest number of retail stores in the U.S. grocery retail industry, has more sales in its stores, which means that its online ratio is lower than Kroger and other retailers. Publix, with the lowest online sales ratio of 1.8%, has 1,258 stores, three to five times the number of stores of Wakefern, H.E. Butt, and Meijer, but has a worse online sales ratio than those retailers.

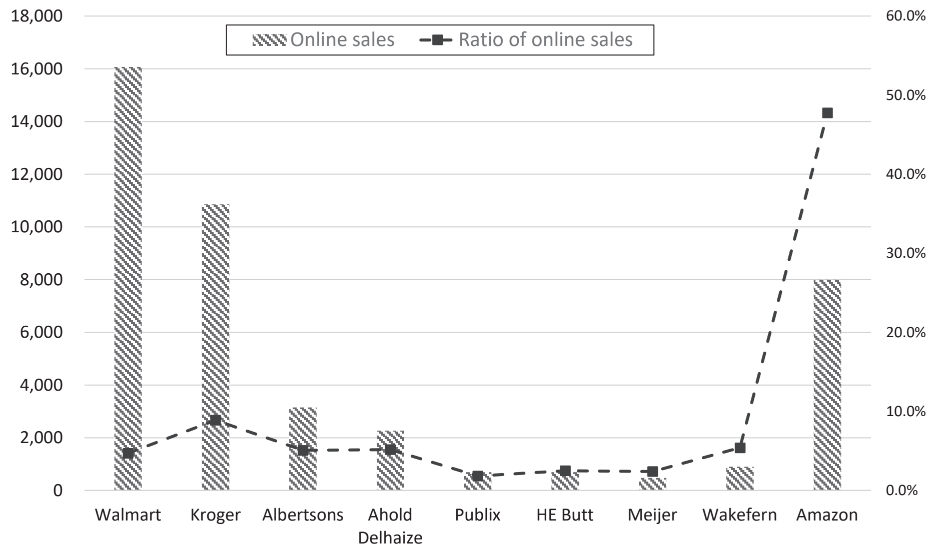
In its online business, it could be confirmed that the number of stores does not necessarily correlate to a higher online ratio, even though it is a grocery retailer that primarily delivers its products from its stores.

Figure.9 Total gross grocery sales and ratio of online sales by retailer (2020)



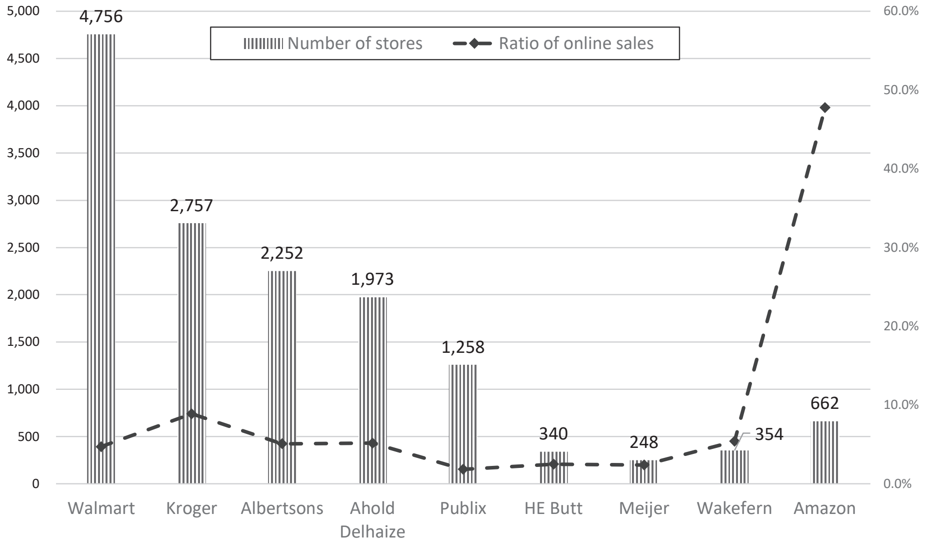
Source: Companies' annual reports and IGD research data

Figure.10 Online grocery sales and ratio of online sales by retailer (2020)



Source: Companies' annual reports and IGD research data

Figure.11 Number of stores and ratio of online sales by retailer (2020)



Source: Companies' annual reports and IGD research data

4.2 Assessment by type of online business development

The above findings will be assessed by the patterns indicated in 3-2. The group operates mainly its own website in Pattern 3. All of the retailers in this group have a high ratio of online sales in 2020. They also have a large number of online sales themselves. The retailers in this group are also characterized by their early entry into the grocery online business.

The fact that they have built and operated their own websites based on their expertise and have been strengthening their online business from early on, is a result of the way they were able to meet the growing consumer demand for online grocery purchases at the Covid-19 infection period.

H.E. Butt, which is in pattern 4, has both a lower percentage of online sales and less online sales than the retailers in pattern 3. However, they are all ahead of the retailers that fall under Pattern 5.

The retailer that corresponds to Pattern 5 has the lowest percentage of online sales and also has the lowest online sales. It conducts online business in cooperation with third parties, but there is a visible difference from the group that is strengthening its online business mainly through its own website. In particular, the difference in the commitment to strengthening online business is directly reflected in the results, as online sales are lower than those of retailers with low in-store sales.

Amazon, in Pattern 6, has fewer stores than Walmart and Kroger, but it has established a system in which it utilizes its stores as warehouses and delivers products ordered online to shoppers, thereby increasing its online sales. Amazon itself is also promoting omni-channel operations by integrating its stores with online operations, including the development of a new grocery retail business.

4.3 Investment in innovative activities

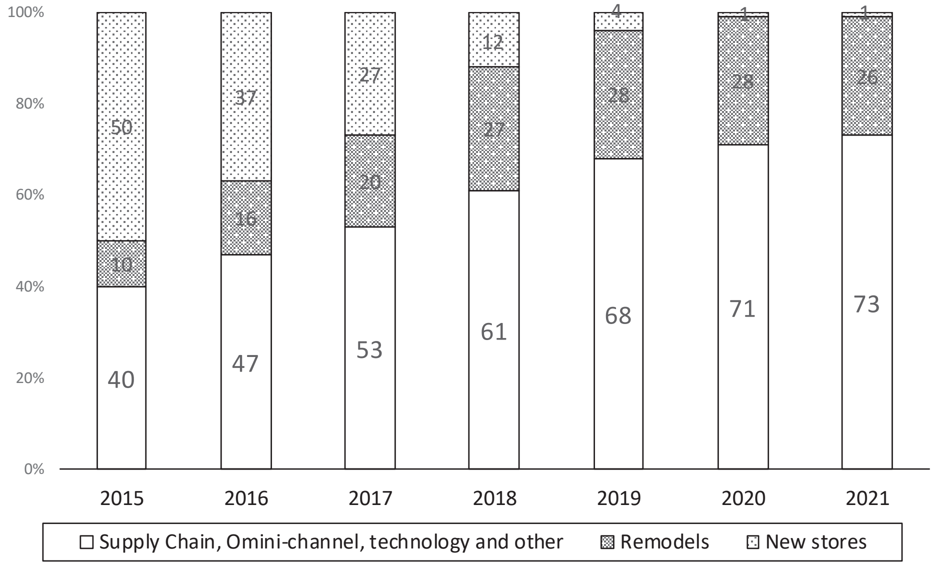
Thus, it is clear that the leading retailers in the B&M retail industry which have grown their grocery online business have invested early in launching their own websites and have also invested early in expanding their networks. As examples of the leading retailers, we look at Walmart and Kroger's capital investment ratios by sector (Figure.12 and Figure.13).

Walmart had the highest ratio of investment in new store openings at 50% in 2015, but since 2016, it has invested the most in supply chain, omni-channel, technology and others. The share of investment in new store openings in 2020 and 2021 is only 1%. On the other hand, the investment in remodels has been increasing every year. Although the retailer refrains from opening new stores, it is necessary to maintain existing stores by setting up a small distribution center in the store and a place to receive purchased products, as they are also the distribution center for online business. Therefore, the investment in remodels is expected to increase. Kroger also saw the highest investment in new stores and remodels at 50% in 2015, which will decrease to 37% in 2020 and 31% in 2021. The investment in digital platforms and supply chain was only 8% in 2015, but increases each year to 19% in 2020 and 23% in 2021.

Kroger first entered the state of Florida in 2021, where it had not previously had a store presence. However, the company chose to enter the state only through its online business and not through its stores. This is an exceptional business strategy for a physical retailer. The state of Florida is where Publix, a latecomer to the online business, is based. Kroger may have thought it could compete better by entering the online business than by entering with stores. This could be a symptom of a shift in the retailer's spatial expansion strategy.

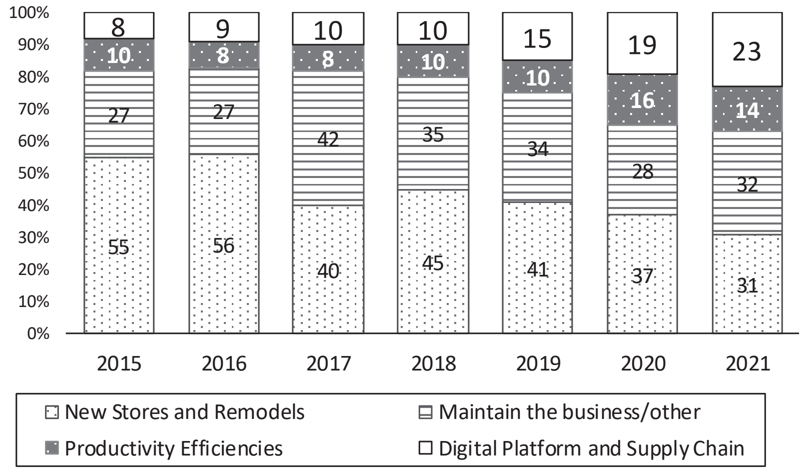
The above findings indicate that the leading retailers in the highly concentrated grocery retail industry have invested aggressively in innovative activities, such as online operations. They have also maintained their existing stores and invested in their online operations, enabling them to become omni-channel retailers. It is clear that such investment behaviors have further resulted in increased competitiveness for the top companies.

Figure.12 Walmart's capital investments (2025-2021)



Source: Company's annual reports

Figure.13 Kroger's capital investments (2025-2021)



Source: Company's fact books

5. Conclusion

Top concentration trends in that industry will result in aggressive investment by leading firms, and these firms will become progressively more competitive. At the same time, proactive investment by top-tier firms will develop its industry, as investment in innovative activities will strengthen its competitiveness. This study confirms that this is exactly the case in the U.S. grocery retail industry. We identified several ways that investments in innovative activities in the U.S. grocery retailing industry can be implemented to expand online businesses, and we developed a pattern of such investments. Next, we analyzed the performance of the online businesses of the leading firms in terms of the ratio of online sales to total sales. Applying them to the pattern we developed, we revealed that the more aggressively a firm invests in building its own online network, the better it performs. Although B&M retailers currently still have significant in-store sales, given this aggressive investment, it is likely that they will become increasingly concentrated at the top of the grocery online market as well. In other words, it can be said that even in the grocery online market, the leading retailers will invest and develop through innovative behaviors. Therefore, among the leading B&M retailers, Publix, which has not been networking through its own construction, has strengthened its technological alliance with its partner Instacart since 2020 in order to keep up with the competition.

Even the leading retailers may not always remain in the top position, as it was announced in October 2022 that Koger, the second largest grocery retailer by sales, will acquire Albertsons, the third largest retailer by sales. Since this is an acquisition of a giant company by a giant company, The Federal Trade Commission (FTC) has reviewed the transaction and the two retailers are in the process of selling hundreds of stores to other retailers in order to avoid an antitrust law violation. Albertsons entered the grocery online market slightly later than the leading retailers, Walmart and Kroger. It has since acquired a meal kit delivery company and opened a marketplace to increase the number of products it handles for sale online to consumers. It also strengthened its logistics by partnering with Takeoff, an automated warehouse provider, and increased its online sales percentage by the 2020

Covid-19 period. Yet the cost burden was too much for the retailer, and in 2021, it decided to outsource its delivery function to a third party, and began using the third party company's platform to conduct marketing promotions, thus shifting from marketing strategy planning and implementation by the company to extensive reliance on a third party. When the two retailers will merge together, Walmart and Kroger and Albertson will account for 35% of the grocery retail market. Furthermore, according to an online article by Digital Commerce360 on October 14, 2022, it is estimated that Walmart and Kroger and Albertsons will have 45% of the grocery online market, and if Amazon is added to the two companies, it will be nearly 70%.

We will further examine how B&M retailers that have entered the grocery online market will invest and compete in this highly concentrated market, and how top-tier retailers will aggressively invest in innovative activities to achieve higher levels of concentration, based on profitability.

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