

Private Label Shielding: Myth, Manipulation, or Misconception?

A Quantitative Study Investigating the Occurrence of Shielding in the Swedish
Grocery Retail Sector

by
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Abstract

The introduction of private label brands (PLBs) have transformed the landscape of grocery retail, challenging the dominance of manufacturer brands (MBs) and redrawing the lines of in-store competition. As shelf space plays a critical role in shaping consumer behavior at the point of purchase, this study investigates whether Swedish grocery retailers allocate shelf space to PLBs in ways that exceed their market share, a practice referred to as shielding.

Through an extensive observational study spanning 21 grocery stores across three leading Swedish retail chains, we analyzed over 45,000 products across 18 staple product groups. Two key measures of shelf allocation are examined to identify the occurrence of shielding: exposure (number of shelf facings) and favored positioning (placement on prime shelves). This study presents clear evidence that PLB shielding is a prevalent practice within the Swedish grocery retail industry. The findings also indicate that this pattern of shelf space allocation is an intentional strategic course of action. By contrast, no evidence of intentional favoring of PLBs in prime shelf positions was found. These findings suggest that retailers may rely more on visual dominance through exposure than on prime shelf positioning to influence shopper decision-making.

Given that Swedish households spend a notable share of their disposable income on groceries, shelf space allocation holds significance not only for the industry, but also for broader societal outcomes. By providing large-scale in-store observational evidence, this study contributes to a deeper understanding of how control over the retail environment may be strategically used to strengthen the position of PLBs, highlighting potential implications for manufacturers, consumers, and the competitive balance in the grocery sector.

Keywords: Shielding, Private Label Brand, Manufacturer Brand, Shelf Allocation, Exposure, Positioning, Grocery Retail, Retailer-Manufacturer Competition.

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Glossary

Shielding: A strategy where retailers allocate more shelf space to their own private label brands than their market share would justify, thereby increasing their visibility and potentially influencing consumer choice.

Private Label Brand (PLB): A brand owned, managed and controlled by the retailer.

Manufacturer Brand (MB): A brand produced and marketed by an external supplier, which the retailer stocks and sells, and to some extent controls, but does not own.

Exposure: The number of visible facings a product has on the shelf, reflecting its visual dominance and likelihood of being noticed by consumers.

Favored Positioning: The placement of products in shelf locations that are more likely to attract consumer attention, such as those at eye or chest level.

Shelf Allocation: The process by which retailers distribute and organize products across shelf space, including the number of facings and their placement.

Prime Shelf Position: Shelf areas typically located at eye or chest level, considered the most valuable for product visibility and consumer influence.

1. Introduction

1.1 Background

Grocery retailing has undergone a profound transformation over the past five decades, particularly in Sweden, where the traditional industry hierarchy has been significantly reshaped by the introduction of retailer's own brands, private label brands (PLBs). Before this introduction, the industry was defined by a clear division of labor: manufacturers produced while retailers distributed. Today, this relationship is far more complex and competitive, marked most notably by the proliferation and surge of acceptance for PLBs.

PLBs are brands that the retailers manage across all aspects, from product development and assortment to pricing and shelf placement (Wu et al. 2021). They have complete ownership over them, as opposed to the traditional manufacturer brands (MBs) which they purchase and manage in-store, ultimately serving as a distribution outlet. The strategic rationale of introducing PLBs is multifaceted. The most straightforward reason is that they provide higher margins for retailers, thereby aiding profitability (Sayman, 2002; Steiner, 2004; Dobson & Chakraborty, 2015; Wu et al. 2021). The other rationale which is less obvious, albeit important, is the enhanced retailer bargaining power (McGoldrick, 2002; Dobson & Chakraborty, 2015; Wu et al. 2021). By growing PLB market share it can be reasonably assumed that retailers become less dependent on manufacturers to supply products for their shelves (McGoldrick, 2002). If PLBs gain ground relative to MBs, retailers have less incentive to maintain extensive stock of MBs, further shifting the power dynamic within the supply chain.

Additionally, PLBs allow retailers to differentiate their offerings, better cater to shifting consumer preferences, and foster customer loyalty (Amrouche & Zaccour, 2006; Dobson & Chakraborty, 2015; Grewal, 2018). According to Johan Neuman, head of PLB at Dagab/Axfood, the use of PLBs has transcended the sole benefits of price and bargaining power to meet specific consumer demands like sourcing and fairness (Svensk Dagligvaruhandel, 2024a). Although retailers employ their own brands for a variety of strategic purposes, it is evident that one of the most impactful advantages of growing PLBs is their influence on the competitive dynamics between retailers and manufacturers.

Initially, PLBs were introduced as a low price alternative to the established MBs. The price difference fostered a consumer perception of PLBs being basic products with low-quality, but to a lower price (Ndlovu, 2024). However, this perception has since PLBs inception, more so recently, shifted substantially as the offerings have evolved through investments in quality improvements and product variety (Ndlovu, 2024). PLBs have become well-integrated into retail assortments and, in many cases, offer quality on par with MBs while maintaining lower prices (Gielens et al. 2021; Johansson & Hultman, 2024). Thus, PLBs are increasingly viewed as viable, high-quality substitutes that deliver strong value (Ndlovu, 2024). In

Sweden, PLBs have over the past 20 years grown by more than 20 percentage points. Since 2004, data show a notable increase of PLB owned market shares in the grocery retail industry, from 8% to 28.5% (SCB, 2005; SCB, 2024), thus corroborating what the research states about PLBs rise. Anna Ekström, Managing Director Nordics at NielsenIQ, presents market data that implies potential contributonal forces to this recent spur in PLB acceptance (Svensk Dagligvaruhandel, 2024a). She describes how the last years, tarnished by an economic downturn, has impacted consumers' purchasing power and resulted in consumers increasing their share of PLB purchases (Svensk Dagligvaruhandel, 2024a). This is an occurrence that is corroborated by another study from 2023 showing how Swedish households had a statistically significant increase in PLB grocery purchases (4%) due to the economic downturn and at the expense of MBs (Lesniak et al. 2023). This data implies an alteration in purchasing behaviour with shoppers increasingly opting for lower-price alternatives, such as PLBs in these times.

The recent economic downturn may have catalyzed a structural shift in consumer behavior, one that weakens traditional loyalty to MBs and creates favorable conditions for the rise of PLBs. As Ekström suggests, increased price sensitivity has likely eroded historical brand attachments, offering retailers a strategic opening to promote PLBs. This price-driven trial of store brands may have challenged earlier perceptions of inferior quality, accelerating consumer acceptance and expanding PLB market share. If this is the case, the traditional competitive advantages held by MBs, such as brand equity and perceived quality (Muruganantham & Priyadharshini, 2017; Riboldazzi, 2021; Ndlovu, 2024), are increasingly diminished. The result is a marketplace marked by intensified brand-switching and reduced loyalty, sharpening the competitive tension between MBs and PLBs at the crucial point of purchase: the retail shelf.

Research suggests that customers are highly impressionable in the in-store environment, presenting it as a crucial platform to affect shopper behavior and final purchasing decisions (Drèze et al. 1994; Inman et al. 2009; Zentes et al. 2017; Bianchi-Aguiar, 2021). The in-store environment, especially shelf space, has emerged as a critical aspect of the power dynamic between retailers and manufacturers. Nordfält and Ahlbom (2018) states that most purchase decisions are made in-store, often within seconds and with minimal deliberation. This quick decision-making process is heavily influenced by visual stimuli (Nordfält & Ahlbom, 2018), such as the number of facings and product positioning, which directly affect the likelihood of a product being noticed and selected (Chandon et al. 2009; Han et al. 2022). In high-frequency purchase categories like groceries, subtle differences in shelf presentation can steer consumers toward a particular brand, prompting them to switch brands impulsively (McGoldrick, 2002). As a result, shelf space not only shapes what consumers buy, but also plays a decisive role in triggering brand-switching at the point of purchase.

1.2 Problematization

We have thus far established that the point of purchase, that is inside the stores, has taken shape as a significant arena for the battle between PLBs and MBs. Furthermore, we have

established how important the in-store environment is to shape consumer behavior. In addition, Swedish households allocate an average of 13,4% of their disposable income to food, of which the majority is spent in the store as opposed to online (Svensk Dagligvaruhandel, 2024b). Taken together, this implies that the one in control over the store environment has a great competitive advantage through the influence they have over what happens in-store. This crucial and powerful advantage falls to the retailers. Retailers have full control over the in-store environment, including what products are offered, how they are displayed, and how they are priced (Dobson & Chakraborty, 2015; Johansson & Hultman, 2024), they essentially control the interaction with the customers. In essence, PLBs are guaranteed full distribution and the most beneficial shelf allocation (Anselmsson & Johansson, 2013; Dobson & Chakraborty, 2015), while manufacturers have to negotiate. This enables retailers to manage every aspect of the consumer's shopping experience and gives them significant leeway to influence shoppers to their benefit.

Furthermore, retailers occupy a dual role in their relationship with manufacturers: they are not only competitors but also customers. Traditionally, retailers were fully dependent on manufacturers for the supply of goods. However, since the emergence of PLBs, this dependence has gradually diminished in tandem with the growth of PLBs, albeit the need for MBs is still strong. With PLBs only holding a little over 28% of the market shares (SCB, 2024), it is apparent that consumers still demand and expect an assortment which includes a fair amount of MBs. Disregarding this could lead to loss of customers to other stores and retail chains, but also the loss of important suppliers (Chakraborty, 2018; Johansson & Hultman, 2024). This duality of retailers' controlling the stores while also taking their dependence on manufacturers into account, creates a delicate and interesting competitive dynamic between the two parties.

There is extensive research regarding the competition between PLBs and MBs, the majority of it focusing on price and product (see for example, Wu et al. 2021; Ndlovu, 2024). However, surprisingly little is known about whether or not retailers actually leverage their control, and use their evident advantage to highlight their own brands. What we do know is that the notion of retailers using their power in this way has been mentioned conceptually, highlighting how retailers oftentimes provide better merchandising for their own brands than MBs by giving favourable shelf space allocation (Chakraborty, 2018; Wu et al. 2021). What they are actually describing is a strategy known as shielding, a competitive strategy coined by Walford and Edwards (1997) which refers to how retailers deliberately overexpose their PLBs at the expense of MBs. By allocating better and more shelf space to their own PLBs, they aim to provide better in-store visibility and thus undermine MBs both by crowding them out, but also to steer customers subconsciously toward PLBs (Håkansson, 2000; Chakraborty, 2018; Wu et al. 2021; Johansson & Hultman, 2024). The occurrence of shielding has been mentioned by a considerable number of Swedish MB representatives, implying on multiple occasions that retailers wield their power to control the shelf space. Håkansson (2000) and Johansson and Hultman (2024) have, twenty years apart, reported concerns from Swedish manufacturers that retailers use shielding to gain advantages. They report manufacturers' claims that retailers provide disproportionate shelf exposure in relation to their market share,

hence not reflecting customer demands. Retailers' on the other hand claim that they do in fact allocate shelf space according to market share (Johansson & Hultman, 2024). We find that there is a discrepancy between how retailers and manufacturers experience the situation, bringing us to an important question, what does reality look like?

To our knowledge, only two observational studies have specifically addressed the reality of shielding. One was performed in Spain over 20 years ago by Fernandez Nogales and Gomez Suarez (2005), and one was done recently in Sweden by Johansson and Hultman (2024), both of which reported clear occurrences of shielding. While both of these studies have the same research focus as this current one, they have limitations which highlight the need for our study. The Spanish study, conducted over 20 years ago, predates the major developments of PLBs that have happened in recent years. Moreover, assuming that the Spanish grocery market is directly transferable to the Swedish context is speculative. Spain is one of the most PLB-dominant markets in Europe with nearly half of all grocery sales coming from PLBs (Statista, 2024), compared to only 28.5 % in Sweden (SCB, 2024), reflecting a very different market environment than the Swedish grocery sector. This calls into question the relevance of the study, making it difficult to generalize its findings to the Swedish market and the year of 2025. While the recent Swedish study is both geographically and temporally relevant, it is limited in scope. By focusing solely on three, and quite niched, products it fails to provide generalizable insights to assess whether shielding is strategically employed by retailers or not. Our study seeks to address these limitations by offering a broader and more current examination of PLB strategies within Sweden's grocery retail sector. This study endeavors to provide concrete evidence in response to a question that, until now, has largely been addressed through assumptions and perceived possibilities; do Swedish grocery retailers employ shielding? By examining whether retailers leverage their control in ways that could be considered strategically unfair, we offer new insights into the dynamics of the competitive nature of PLBs and MBs. Furthermore, we will explore the broader implications of our findings, mainly focusing on the retailers themselves, but nonetheless drawing necessary connections to the manufacturers and customers.

1.3 Research Purpose

The main purpose of this study is to investigate whether Swedish grocery retailers shield their private label brands by enhancing their shelf presence and visibility, in other words does shielding exist in the Swedish grocery retail industry? This research question will be examined through two key measures: exposure, defined as the total share of PLB facings relative to their corresponding market shares; and favored positioning, defined as the share of PLBs compared to MBs in prime shelf positions.

The purpose of this research can be divided into three main objectives: (1) to investigate whether shielding occurs across retail chains in terms of exposure and favored positioning, (2) to investigate whether PLB shielding occurs across store formats in terms of exposure and favored positioning, and (3) to compare current findings with those of Johansson and Hultman (2024) to examine whether PLB exposure has changed over time.

To address these objectives, multiple in-store observations were carried out. A total of 21 stores across three major Swedish retail chains and their various store formats have been visited. Furthermore, 18 different product categories have been evaluated, thus providing a solid foundation for investigating whether or not shielding is implemented in Swedish grocery stores. The data collection process involved photographing store shelves, and subsequently followed by coding, calculating, and lastly analyzing the results.

1.4 Aimed Contributions

This study contributes to the growing body of research on competitive dynamics between PLBs and MBs, with particular focus on the phenomenon of shielding. While prior studies (see for example, Wu et al. 2021; Ndlovu, 2024) have examined the PLB-MB rivalry extensively, shielding has primarily been discussed at a conceptual level (see for example, Chakraborty, 2018; Wu et al. 2021). Moreover, these studies have failed to make a clear connection to shielding's potential impact on the competitive retail landscape. In addition to the conceptual studies, merely two real-life studies have been published (Fernandez Nogales & Gomez Suarez, 2005; Johansson & Hultman, 2024). Although insightful, none of these studies are generalizable to the Swedish grocery retail sector.

This study is motivated by the observation that, despite shielding's potentially central role in shaping the balance of power between retailers and branded manufacturers, it has not yet been extensively researched. Both scholars (Chakraborty, 2018; Wu et al. 2021) and industry actors (Håkansson, 2000; Johansson & Hultman, 2024) have expressed concern that shielding may be used as a strategic tool by retailers to reinforce the position of their own brands, yet little is known about the extent to which this actually occurs in practice.

Through a quantitative and exploratory research approach, the study aims to deliver statistically grounded insights that move beyond speculation. By doing so, it contributes with clear proof as to whether or not shielding exists, as well as its potential influential forces on the competitive dynamics between PLBs and MBs.

1.5 Outline of the Thesis

This paper is organized into six chapters. Following the introduction, which outlines the background, research purpose, and intended contributions, the literature review presents relevant theories and previous studies that frame the research. Thereafter, the method chapter describes the data collection and analytical procedures employed, including the selection of stores and product groups, as well as the statistical tests used to assess shielding. This section also addresses methodological rigor through discussions on validity, reliability, and ethical considerations. Next, we present the results of the data analysis. This is followed by the analysis and discussion chapter, which interprets the results in relation to previous literature, with a focus on the implications of shielding. Finally, the thesis concludes with a presentation

of the overall conclusions, including theoretical and practical contributions, and suggestions for future research.

2. Literature Review

The grocery retail industry has undergone a profound transformation over the past two decades, with PLBs emerging as a key driver of competition between retailers and manufacturers. As a consequence of this shift, the practice of shielding has gained attention among both researchers and manufacturers (Chakraborty, 2018; Wu et al. 2021; Johansson & Hultman, 2024). While PLBs serve as the medium through which shielding is enacted, they are not necessarily the primary subject of interest. Instead, the focus of this study lies in examining the strategic behaviors of retailers themselves.

Although research on private label management, including consumer perception, positioning strategies, and product development, is undeniably important for understanding the broader competitive dynamics between retailers and manufacturers, it is not directly relevant to this study's research question. Given that PLBs have reached a stage where they are seen as viable and equal competitors to MBs (see for example, Muruganantham & Priyadharshini, 2017; Riboldazzi, 2021; Ndlovu, 2024), the competitive landscape has intensified, especially as consumers increasingly accept PLBs as credible alternatives.

These developments highlight the growing strategic relevance of the in-store environment in shaping the outcome of this brand type rivalry. This review therefore centers on the retailer perspective, specifically investigating whether Swedish grocery retailers engage in shielding, their motivations for doing so, and the consequences that may arise. To address this, the thesis draws upon four interconnected research areas within retail management: (1) the retailer-manufacturer relationship, (2) the in-store environment's influence on shopper behavior, (3) shelf allocation and shelf positioning, and (4) assortment variety. However, before reviewing these research areas, we will begin by defining the concept of shielding.

2.1 Shielding

Shielding is a concept first introduced by Walford and Edwards (1997) referring to the practice by which retailers overexpose their PLBs in-store, often by allocating them more prominent or strategically positioned shelf space. Conceptually, this strategy is rooted in the retailer's dual role as both customer and competitor to manufacturers, and seeks to influence consumer choice by manipulating in-store visibility (Chakraborty, 2018; Wu et al. 2021). In practice, shielding manifests through actions such as assigning more facings to PLBs and prioritizing their products for favorable shelf positioning, all of which at the expense of MBs (Han et al. 2022; Johansson & Hultman, 2024).

Prior research has highlighted the possibility of these strategies occurring. Han et al. (2022) report that decreasing MB shelf presence in favor of PLBs could be a viable way for retailers to maximize revenue, particularly when large MBs are involved. Chakraborty (2018) and Wu et al. (2021) similarly highlight how retailers may allocate better shelf positioning to their PLBs, thus suggesting an uneven playing field. Wu et al. (2021) also note that this kind of preferential treatment, while beneficial to PLB performance, may harm category profitability

by limiting product variety. This research aligns with Håkansson's (2000) and Johansson and Hultman's (2024) findings from Sweden. In the year 2000, Håkansson highlighted concerns from manufacturers in Sweden, who believed that retailers were over-exposing their PLBs to the detriment of the leading brands in their category. Håkansson's findings suggested that Swedish retailers were giving excessive shelf space to private labels in comparison to their market shares, a sentiment that was echoed by Johansson and Hultman (2024) over two decades later. Representatives for MBs, interviewed for their study in Sweden, continued to report similar frustrations noting that the allocation of shelf space was increasingly skewed in favor of PLBs, often at the expense of MBs.

With this background on shielding, the remainder of the literature review will explore the underlying factors to shielding, further enhancing the understanding of shielding in the broader retail context.

2.2 The Retailer-Manufacturer Relationship

Understanding the relationship between retailers and manufacturers is essential for investigating the dynamics behind shielding. This literature stream sheds light on how both the power imbalance and interdependence between these actors facilitates and constrains the possibilities of shielding. Specifically, this section focuses on how the dual role of retailers, as both customers and direct competitors to MBs, creates opportunities that make shielding a strategically relevant consideration.

Retailers operate in a double-agent position. On one hand, they act as distributors of MBs, and on the other hand they compete directly with those same MBs by offering PLBs that often serve as substitutes within the same categories (Anselmsson & Johansson, 2013; Dobson & Chakraborty, 2015; Johansson & Hultman, 2024). This dual role means that while the relationship appears cooperative in terms of product distribution, it is also marked by vertical and horizontal competition, involving both profit margins and market shares (Dobson & Chakraborty, 2015; Chakraborty, 2018). However, the dynamics of this relationship do not end with the double agent position, retailers also serve as the gatekeepers of the market (McGoldrick, 2002; Johansson & Hultman, 2024). As gatekeepers, they have complete control over the store environment, deciding which products are stocked, how much space each product receives, where it is placed, and at what price it is sold (Dobson & Chakraborty, 2015). This control gives them immense power over both PLBs and the MBs, enabling them to manipulate conditions such as shelf allocation to favor PLBs, in essence, to use shielding.

From the manufacturers' side, the asymmetry in power is evident in their limited response options. Strategies such as withholding supply or exiting the retail channel are often unviable as they risk losing consumer access and market share (Dobson & Chakraborty, 2015; Chakraborty, 2018). This dependency further reinforces the retailer's leverage and sets the stage for shielding to emerge as a viable competitive tactic.

Although retailers hold significant power, their role as customers and their dependence on certain MBs as “must-stock” products still constrains their freedom to act however they want. Consumers expect to find trusted, market-leading brands on shelves, and failure to meet these expectations can result in losing customers to other stores and retail chains (Anselmsson & Johansson, 2013; Johansson & Hultman, 2024). Therefore, retailers must navigate a fine line between promoting PLBs and preserving essential MBs to maintain customer satisfaction.

Ultimately, this area of research illustrates that the phenomena of shielding is not an isolated tactic but a strategic consequence of the retailer-manufacturer dynamic. The retailer’s control, commercial interests, and interdependence with manufacturers collectively shape the likelihood and form of shielding behaviors.

2.3 The In-Store Environment’s Influence on Shopper Behavior

This area of research is critical for understanding how the in-store environment shapes shopper behavior, especially as it facilitates and directs the shopper’s path to purchase. Given that shielding inherently involves manipulating the visibility and accessibility of competing products within the retail setting, a foundational understanding of consumer behavior in this setting is essential.

Retailers exert considerable power over how products are displayed, promoted, and priced (Dobson & Chakraborty, 2015; Johansson & Hultman, 2024). Nordfält and Ahlbom (2018), highlight two key insights: most purchase decisions are made or influenced in-store, and these decisions are typically made within seconds and without much deliberation. Moreover, although shoppers often claim the opposite, many decisions and unplanned purchases are still made on-site (Nordfält et al. 2014). This underscores the impact of store stimuli on shaping consumer choices, resulting in shoppers omitting multiple steps of the decision process and thus making unplanned rash decisions. Visibility and prominence on the shelf are thus crucial in shaping decisions in a low-involvement, time-constrained setting. Zentes et al. (2017) reinforce this, arguing that the store environment strongly guides shopper behavior, potentially influencing sales to a significant degree.

Retailers control over shelf space, as a limited and strategic resource, can be considered one of their strongest competitive tools. Han et al. (2022) found that shelf displays have a significant impact on brand choice at point of selection. Retailers can alter the number of facings and product positionings, determining not only the likelihood of being noticed but ultimately the chances of being selected. Chandon et al. (2009) demonstrated that a greater number of shelf facings strongly influences visual attention, which in turn raises the likelihood of selection. In fact, the brand that captures our attention when standing in front of the shelf is, in most cases, the one we ultimately choose (Nordfält & Ahlbom, 2018). Similarly, Bianchi-Aguilar et al. (2021) emphasize that space allocation not only boosts visibility but also perceived availability, both of which are crucial drivers of product demand.

Choosing a product is typically fast, automatic, and a visually driven feat (Nordfält & Ahlbom, 2018). McGoldrick (2002) notes that the store environment is designed to stimulate impulse purchases, with shoppers relying on heuristics and emotional cues. Subtle differences in presentation, such as positioning and facings, can steer choices toward a specific product (Han et al. 2022). In fact, high purchase frequency categories, such as groceries, are particularly susceptible to these effects (McGoldrick, 2002). Moreover, the "mere exposure" effect reinforces the role of visibility, suggesting that repeated visual presence fosters positive attitudes toward a product (Nordfält & Ahlbom, 2018). This psychological mechanism explains why product visibility is central to shielding and supports the idea that retail space is not neutral but highly influential.

Finally, a study by Nordfält (2009) highlights the importance of the shopper's purpose when entering a grocery store, particularly in relation to how responsive they are to in-store stimuli. His findings suggest that consumers are more susceptible to unplanned purchases during fill-in trips, which are typically shorter and less planned, compared to larger, more structured shopping trips. Assuming that fill-in trips are more often associated with smaller store formats, while large shopping trips usually take place in larger format stores, this suggests that shelf allocation strategies may have a greater influence in smaller stores. Consequently, the potential impact of shielding could be more pronounced in these smaller formats, offering retailers a greater strategic advantage in these store formats.

In conclusion, the in-store environment is not merely a backdrop to consumer behavior, it is an active driver of it.

2.4 Shelf Allocation and Positioning

The way products are displayed on store shelves plays a crucial role in shaping consumer behavior and has direct implications for shielding strategies. Shelf allocation refers to how retailers organize and position different products and brands within the retail space. These placement decisions significantly influence consumer choice at the point of sale.

Research has long established that retailers use shelf allocation and positioning to manipulate consumer behavior (Drèze et al. 1994; van Nierop et al. 2008; Chandon et al. 2009; Dobson & Chakraborty, 2015). Increasing the amount of shelf space allocated to a brand enhances its prominence in the store, making it a more attractive option for shoppers (Chandon et al. 2009). Research by van Nierop et al. (2008) corroborates this, demonstrating that products with more facings are likely to experience higher sales. The link between shelf visibility and sales potential is further supported by Drèze et al. (1994). Visibility and prominence on the shelf thus become key levers in driving choice, particularly in a retail environment where decisions are made quickly and with low engagement.

In practice, shelf space is often allocated in proportion to a brand's market share, a rule of thumb acknowledged both as an industry norm (McGoldrick, 2002; Zentes et al. 2017), and by retail representatives in the Swedish market (Johansson & Hultman, 2024). However,

critics argue that this approach disproportionately benefits established brands, potentially crowding out innovative or high-margin alternatives and resulting in assortments that may appear repetitive or uninspiring (McGoldrick, 2002). Despite industry principles or such criticism, it remains entirely legal for retailers to allocate shelf space as they see fit, one of the many advantages of controlling the retail environment. If retailers deviate from market-share based allocations, however, it suggests the implementation of a deliberate push-strategy, promoting preferred brands like PLBs over what customer demand alone would dictate (McGoldrick, 2002). In other words, it could be a sign of shielding if these pushed brands consist solely of PLBs. While this approach may increase profitability, it also carries the risk of alienating customers if their preferences are not met. On the flip side, a growth in PLB sales driven by shielding may eventually shift market shares in favor of PLBs, thereby retroactively justifying their expanded shelf presence. As PLB sales increase, so too does the retailer's bargaining power, potentially diminishing their reliance on manufacturers (McGoldrick, 2002). The less dependent retailers are on manufacturers, the more dominant their position becomes. As PLBs continue to gain market share, this not only reflects a shift in consumer preferences but also suggests that customers may no longer rely on MBs to feel satisfied with the store's overall offering.

The strategic importance of product positioning, particularly vertical shelf placement, is well documented. It is well-established that "eye level is buy level", a notion supported by multiple studies (see for example, McGoldrick, 2002; Zentes et al. 2017). Products positioned at middle or top shelf heights, aligning with the shopper's natural line of sight and reach, tend to receive substantially more visual attention and experience higher purchase rates (Drèze et al. 1994; Chandon et al. 2009; Bianchi-Aguiar et al. 2021). Empirical findings by Nordfält and Ahlbom (2018) further demonstrate that vertical positioning has three times the impact of horizontal placement, and proves even more influential than the number of facings. While increasing the number of facings can elevate a product's prominence in the store, thus attracting attention and boosting sales (Drèze et al. 1994; Nierop et al. 2008; Chandon et al. 2009), positioning on the shelf remains a more powerful determinant of purchase behavior. Moreover, the relationship between shelf space and sales follows the principle of diminishing returns; as the number of facings rise above a certain number, the additional sales gain becomes progressively smaller (Drèze et al. 1994; van Nierop et al. 2008). Notably, the effect of additional facings is most pronounced when a product is placed in less favorable positions (Burke & Leykin, 2014), suggesting that retailers can compensate for suboptimal position by increasing shelf space, albeit less efficiently.

Retailers who allocate premium space to their own PLBs, through increased facings or better positioning, can effectively steer customer attention and choice away from MBs. As McGoldrick (2002) argues, shelf space alone can serve as a persuasive cue, subtly shaping shopper behavior even in the absence of conscious deliberation. This power to structure the choice environment constitutes not only a competitive advantage for retailers, but also a strong influence over shoppers and their decision-making.

Altogether, this stream of research contributes to a more concrete understanding of how the physical retail space affects purchasing behavior. Given that shelf allocation provides both a scarce and influential resource, it is evident why access to premium shelf space is a contested and valuable asset. If one brand is given prime shelf real estate while another is tucked away in low-visibility areas, the outcomes can be vastly different. Understanding which placements are most effective, and how customers respond to variations in exposure, offers crucial context for assessing whether retailers are deliberately structuring the visual field to favor PLBs. Because shielding strategies rely on exploiting these dynamics, this body of literature is critical to understanding their effectiveness. Finally, these insights also provide the methodological foundation of this study, guiding how shelf allocation and placement is measured and interpreted in the evaluation of shielding strategies.

2.5 Assortment Variety

Retail strategies around product assortment and variety also affect consumer expectations and experiences, a notion that is directly relevant when considering how shoppers may react to a potential imbalance between PLB and MB representation in stores. We briefly addressed this earlier in the discussion of the retailers' dual role, as assortment variety pertains to their role as customers of manufacturers and highlights the continued dependence retailers have on them to supply a competitive and attractive product range.

Retailers manage assortment width and product variety through a continuous balancing act that must reconcile customer satisfaction, profit margins, and the pressures exerted by both leading manufacturers and their own agendas. As Zentes et al. (2017) highlight, assortment variety ranks as the third most important factor for consumers' store choice, following location and price. Therefore it is important to consider how the assortment variety should present itself, while maximizing profits. PLBs offer higher margins and exclusivity to the chain, features that directly support store profitability and customer loyalty (Dobson & Chakraborty, 2015; Zentes et al. 2017; Johansson & Hultman, 2024). Still as Jens Hultman, professor in business administration and industry expert, notes, increased PLB share does not necessarily reduce overall assortment breadth, though it may narrow brand variety (Larsson, 2024). This distinction matters as shoppers may still perceive sufficient choice in terms of price points or quality levels even if the number of unique brand names diminishes. Nevertheless, customers expect to find key MBs in their preferred stores, especially the market leaders (Johansson & Hultman, 2024). Their absence may prompt shoppers to turn to competitors, underscoring the essential "pull" function of MBs which not only enhance store image but are also often demanded by name due to heavy advertising and longstanding loyalty (Zentes et al. 2017). Anselmsson and Johansson (2013) confirm that the failure to stock expected brands can redirect consumers to rival retailers. However, high-share, well-known MBs tend to remain resilient in the face of assortment shifts; as long as they are stocked, even with reduced prominence, they continue to capture attention (Nordfält & Ahlbom, 2018). By contrast, less dominant MBs face greater vulnerability. Thus, while PLBs offer strong financial incentives, they cannot fully substitute MBs without strategic risk.

Another important consideration is the potential decrease in manufacturers' investment, and ultimately, product quality among MBs (Dobson & Chakraborty, 2015). While consumers may initially benefit from PLBs through expanded choice and lower prices, an overemphasis on private labels could in the long term hinder consumer welfare and stifle innovation if it leads to the displacement of MBs. Retailers are aware of this delicate balance. Chakraborty (2018) emphasizes that while retailers may seek to promote their PLBs, there are practical limits to how aggressively they can do so without jeopardizing the continued presence and strength of valued MBs. This reflects the underlying interdependence between retailers and leading MBs: while MBs rely heavily on shelf visibility to sustain sales, they also serve as key traffic drivers for retailers (Johansson & Hultman, 2024). Pepe et al. (2012) underscore the importance of prioritizing category profitability, rather than focusing exclusively on the success of one brand type, is essential. Effective assortment strategies involve aligning the product mix with customer expectations, striking a balance between PLBs and MBs to maintain store attractiveness and maintain customer satisfaction.

Ultimately, the management of assortment variety is more than a logistical necessity, it is an expression of retail strategy and power. It illustrates how retailers navigate the balance between satisfying consumer expectations, maximizing profitability, and managing relationships with suppliers. This review of the literature is therefore essential, as it not only enhances our understanding of how shielding can be operationalized, but also highlights the structural and strategic constraints that may limit its use.

2.6 Conclusion

This literature review has identified four key theoretical areas that will form the analytical foundation for this study: the retailer-manufacturer relationship, the influence of the in-store environment on shopper behavior, shelf allocation and positioning, and assortment variety. These areas collectively highlight mechanisms through which retailers may perform shielding, as well as guiding the interpretation of the results and discuss their implications.

The concept of the retailer's dual role, as both a distributor and competitor, will serve as a central lens for understanding how shielding even would be possible. Additionally, the balance between both roles will help us interpret potential power imbalances and what consequences they might bring. Moreover, the retail space's influence will help explain why shielding can serve as a viable tool to gain competitive advantage at the point of sale.

The previous research on shelf allocation serves as highly important as the store shelves is where the battle between PLBs and MBs take place, thus playing the central role in the phenomena of shielding. Furthermore, we will rely on theories on shelf allocation, particularly positioning, as a foundation for this research's methodology. It will guide our decisions on what can be considered prime shelf positionings. Ultimately this research field will be essential in analyzing our observed data on facings and favored positionings.

Finally, assortment theory will be used as an addition to the discussion on potential consequences from shielding in relation to assortment variety and customer satisfaction. This will allow us to assess whether prioritizing PLBs risks crowding out important MBs, and thereby influence both assortment quality and store image.

Together, these theoretical areas provide a structured basis for analyzing the prevalence, patterns, and potential implications of shielding within Sweden's grocery retail sector. By grounding our interpretation in these concepts, we aim to produce a nuanced understanding of how retailers may use shielding in order to influence brand competition.

3. Methodology

The methodology chapter outlines the research design and methods selected to analyze how shelf space is allocated between PLBs and MBs in the Swedish grocery retail industry. This study adopts a methodologically rigorous approach grounded in both theoretical insights and previous empirical application. This includes a discussion of the philosophical underpinnings of this study, followed by a discussion about the selection criteria for both the stores and product groups. Furthermore, this chapter elaborates on the data collection method, criteria for processing the data, as well as how the data is subsequently analyzed. Finally, this chapter provides a discussion of the ethical considerations, a critical evaluation of the validity and reliability of the study, as well as acknowledging potential limitations to offer transparency regarding potential constraints of the research. Ultimately, the chapter provides a thorough and consistent discussion regarding the foundation of this current research.

3.1 Research Approach

This study is grounded in a realist ontological perspective, which assumes that one objective reality exists (Easterby-Smith et al. 2021), independent of subjective interpretation. In the context of this research, that reality concerns whether shielding is occurring or not. In other words, there is either shielding or there isn't, and through systematic investigation that fact can be uncovered.

Aligned with this ontology, the study adopts a positivist epistemological approach, which emphasizes an objective and detached stance in the research process (Easterby-Smith et al. 2021). By observing in-store dynamics from a distance, without interference or subjective interpretation, we aim to generate unbiased and measurable knowledge about shelf allocation practices. While positivism enables strong and generalizable conclusions, it also comes with limitations, notably, that alternative explanations for observed patterns may be difficult to fully control for, particularly in complex real-world environments like grocery retail stores.

Given this philosophical foundation, a quantitative research approach is employed. There are essentially three reasons underpinning this choice. First, the study relies on direct in-store observations, enabling a structured and standardized data collection process. Second, the quantitative design allows for broader coverage, both geographically and across a wide range of product categories, enhancing the study's generalizability and representativeness. Finally, by using a quantitative approach it allows for strong statistical comparison and rigor, reducing researcher bias and ensuring that conclusions rest on observable, quantifiable evidence. Ultimately, a quantitative research approach ensures systematic and replicable measurements, critical for making conclusions on whether shielding occurs or not.

3.2 Research Design

This research study is primarily of an exploratory and cross-sectional nature, focusing on investigating whether the occurrence of shielding exists or not. However, since we want our

findings to provide robust and statistically proven results, as well as being generalizable, there is part of this study that is of inferential nature. In other words, we will discuss the results of our data analysis to draw conclusions from an industry perspective, speculating on the implications of our study based on observed patterns. The decision to incorporate statistical methods was based on the limitations of relying solely on absolute number comparisons. While it is possible to compare the share of PLBs to their corresponding market shares without statistical testing, such an approach lacks the robustness and generalizability required for meaningful and credible conclusions.

Moreover, the study aims to present a small additional study based on the research by Johansson and Hultman from 2024. By comparing results from this current study, with the results presented by them a year ago, this study also provides an examination of the temporal effects on shielding practices.

3.2.1 Data Collection Method

The data for this study was gathered through direct in-store observations, enabling the documentation of actual shelf allocation practices with a high degree of accuracy and contextual relevance. Fieldwork was conducted during April 2025 in four different cities across Skåne, Sweden: Kristianstad, Lund, Helsingborg, and Malmö. It involved visits to a total of 21 grocery stores representing a diverse mix of chains and store formats. Additionally, stores were selected from different types of urban areas, including both central city locations and more residential areas, to provide a broader and more varied sample of retail environments. To ensure representativeness, the sampling strategy included three stores per store format.

During each store visit, the shelves displaying the selected product groups were photographed, making sure that all products within each of the 18 product groups were captured. This approach allowed for detailed visual documentation of how shelf space was allocated in each store between the two brand types; PLBs and MBs. The use of photographic evidence provides a rich and objective dataset for assessing number of facings, and shelf positionings, key indicators in evaluating the potential presence of shielding practices. By capturing the physical retail environment at the point of observation, this method supports accurate and replicable analysis in line with the study's research approach.

3.2.1.1 Selection of Stores

As previously mentioned, the data has been collected in four different larger cities in Skåne, Sweden. This geographical focus was strategically chosen for feasibility, while still allowing for the collection of data representative of national trends. Although the selection of stores is geographically limited, the structural and strategic consistency across chain formats throughout Sweden strengthens the generalizability of the findings (Konkurrensverket, 2024).

The three chosen retail chains for this study are; ICA, Coop and Willys. According to the report by DLF and Delfi (2024), ICA is the largest grocery chain in Sweden, followed by

Axfood (which owns Willys) and Coop. Collectively, these three groups represent 88.8% of the Swedish food retail market. Consequently, focusing on these players ensures that the study reflects dominant market practices and captures meaningful dynamics relevant to both retailers and policymakers.

The selection of ICA, Coop, and Willys is based not only on market share, but also on their broad national presence, variety in store formats, and the diversity in their PLB portfolios. This makes them particularly valuable for analyzing competitive behavior and shelf allocation strategies. Other retailers, such as Lidl, were excluded due to their relatively small market share and a significantly different retail model. For example, Lidl's assortment comprises over 61% PLBs (DLF, 2024), which creates a structurally different context that limits comparative relevance. Additionally, Lidl's focus on atypical, often unfamiliar brands and extreme low-price positioning distinguishes it from the more conventional retail chains included in this study.

Within the Axfood group, Willys was selected over other chains like Hemköp and City Gross because it is the group's leading brand and provides a wider range of store formats. Willys' dual-format structure (Willys and Willys Hemma) enables richer comparative insights into how format influences shelf allocation. Selecting only Willys also helps avoid internal biases that might arise from examining multiple chains within the same corporate group that share PLBs and centralized strategic decisions. Below follows a more detailed description of each of our chosen retail chains:

- **ICA** operates approximately 1,300 stores across Sweden with four primary store formats: ICA Nära, ICA Supermarket, ICA Kvantum, and ICA Maxi. It offers seven distinct PLBs, including ICA, ICA I Love ECO, ICA Gott Liv, ICA Selection, ICA Skona, ICA Basic, and ICA i samarbete med Apotek Hjärtat (ICA, n.d.; ICA Fastigheter, n.d.).
- **Coop** operates around 800 stores and is a member-owned cooperative. It runs three main store types: Coop, Stora Coop, and the discount chain X:-tra. Its PLBs include Änglamark, Coop, and Xtra (Coop, n.d.a; Coop, n.d.b; Coop, n.d.c).
- **Willys**, part of Axfood, operates around 200 stores under two formats: Willys and Willys Hemma. It offers five PLBs; Garant, Eldorado, Såklart, Minstingen, and Fixa (Axfood, n.d.a; Axfood, n.d.b).

To enhance the depth and robustness of our study, we collected data from multiple store formats within Sweden's largest retail chains, improving the generalizability of our findings. By extending our research beyond a specific format we increase our sample and ensure contextual relevance by aligning with the chains' market presence. Including different store sizes also allows us to examine whether the occurrence of shielding varies by format, adding nuance to our analysis.

By visiting three stores per format, we minimize the impact of store-specific anomalies and strengthen the reliability of our dataset. This design not only increases internal consistency across different retail environments but also broadens our ability to detect trends and deviations in shelf space allocation practices across the Swedish grocery sector.

It is important to note that while some chains offer multiple store formats within the scope of this study, others have fewer formats available. For Chain A, we have selected three store formats that cover the majority of its market presence relevant to our research. In contrast, Chains B and C have fewer store formats that fall within the scope, which is why two formats from each chain are included.

To protect the anonymity of both the retail chains and their store formats, all chains and formats will be anonymized in the analysis. Store formats are labeled using a combined chain and size identifier: for example, ‘A1’ refers to the largest store format within Chain A, ‘A2’ the medium-sized format, and ‘A3’ the smallest. This naming structure is applied consistently across all chains, in order to ensure confidentiality while maintaining analytical clarity.

3.2.1.2 Criteria Selection of Product Groups

The selection of the 18 product groups included in this study was guided by two main criteria to ensure both analytical rigor and contextual relevance. First, we prioritized product groups for which market share data was available, enabling comparisons between observed shelf space and actual sales performance. Specifically, we selected product groups that fall within the broader product categories defined by Statistiska Centralbyrån (SCB), which provides the only publicly available data on the market share distribution between PLBs and MBs in Sweden. While SCB's market share statistics are based on relatively broad categories and may not perfectly align with the specific product groups analyzed in this study, they still offer valuable comparative and contextual insights. Second, the selection focused on everyday staple items, that is, products frequently purchased by a majority of Swedish households. The decision of the final selected product groups was supported by Livsmedelsverket's Swedish Market Basket Study 2022 (2024), which identifies the most commonly consumed food categories in Sweden. By targeting such essential products, the study ensures that the findings reflect typical consumer purchasing behavior and in-store exposure patterns.

Together, these criteria strengthen the study's relevance and validity by anchoring the analysis in representative product categories that are both commercially significant and commonly purchased, while also allowing for empirical comparison with national market share trends.

3.2.1.2.1 Selection of Product Groups

In the analysis, we focus on entire product groups, such as milk and bread, rather than on individual product types, such as full-fat milk and whole grain bread. This decision is grounded in both methodological reasoning and practical relevance.

Firstly, analyzing full product groups allows us to capture the diversity within categories, accounting for a range of consumer preferences in flavors, sizes, and nutritional profiles. This more accurately reflects how consumers shop, as they typically browse and choose among a set of options rather than seeking out a single specific product. Secondly, this approach aligns with how market share data is reported. The data provided by SCB, which we rely on for comparative analysis, is aggregated at the category level. By studying full product groups instead of product types, we move one step closer to the aggregation used in the market share data. Thus, we enable statistically relevant comparisons between shelf space and market share across PLBs and MBs. Thirdly, examining entire product groups enables the identification of retail strategies and patterns in how shelf space is allocated. Retailers make allocation decisions at the group level, not for individual products. This broad perspective helps reveal whether there is systematic favoring of PLBs and offers deeper insights into competitive dynamics. By limiting ourselves to product types we might not be able to capture shelf positioning strategies, an issue we have faced in some of the smaller store formats. Finally, focusing on product groups also reduces the influence of outliers or short-term fluctuations, such as temporary stockouts or localized promotions, thereby increasing the stability and reliability of the analysis.

Albeit, due to the limitations of this study, primarily time constraints, we have had to make some exceptions. In large product categories, such as grains, cereals and meat, we opted for meeting a large range of the products. Therefore we eliminated some product types within the product groups to reduce the data.

Product Categories	Dairy	Oils and Fats	Grains and Cereals	Meats and Protein	Vegetables	Flavorings	Drinks
Selected Product Groups	Milk	Butter	Rice	Minced Meat	Frozen Vegetables	Stocks and Stock Cubes	Filtered Coffee
	Cheese	Liquid Margarine	Pasta	Refrigerated Meatballs			
		Oil	Bread	Sausages			
			Oats	Frozen Chicken Breast			
			Flour				
			Cereal				

Table 3.1. Selected Product Groups.

An overview of the selected product groups is illustrated in table 3.1 above. Further notes and specifics are described below.

- **Dairy:** Milk and sliceable hard cheese. All sizes, fat contents, and flavors were included.
- **Oils and fats:** Butter for bread, liquid margarine, and oils limited to olive oil and rapeseed oil.
- **Grains and cereals:** Rice, pasta, bread, regular oats, wheat flour, and breakfast cereals. Since this is a large product category some exclusions were made. Only standard sandwich bread were included, thus excluding bake-off variants, hamburger buns, and sausage buns. We decided to only include plain oats, thus excluding fibre variants, and wheat flour, including both all-purpose and bread flour, but excluding whole grain, pizza flour, and other specialty flours. In regards to breakfast cereals we limited the data to consist of traditional cereal and granola, thereby excluding müsli.
- **Meats and protein:** Minced meat (100% meat), refrigerated meatballs, standard sausages (such as different variations of hot dogs, albeit excluding all flavoured

options), Swedish “falukorv”, and frozen chicken breast fillet (included due to their widespread consumption (Äkta Vara, 2021).

- **Vegetables:** Here we opted for frozen vegetables, specifically broccoli, cauliflower, and green peas as they were sold across all stores and formats enabling cross-store comparison.
- **Flavorings:** Stocks and stock cubes, including all flavors. This product group was primarily chosen due to its inclusion in the previous study by Johansson & Hultman (2024), thus making it a necessary inclusion for this current study.
- **Drinks:** We decided to add filtered coffee, perhaps a product choice that might not be as apparent as the rest. However, we find it an interesting addition due to the current extreme price increase for coffee in Swedish stores. Additionally, it is a staple in most Swedish households.

This categorization was carefully constructed to reflect everyday grocery purchases made by the majority of Swedish households. The choices reflect Livsmedelsverket and their *Swedish Market Basket Study 2022* (2024), ensuring that the findings are not only statistically reliable but also relevant to real-world consumption. Another important underpinning to these choices is the correlation between these product categories, and respective product groups, to the product categories presented in the SCB’s market share data.

Finally, we would like to specify the three product types analyzed in the comparative partial study. These choices were made entirely due to their inclusion in the previous study and consist of; cornflakes, vegetable stock, and Swedish falukorv.

3.3 Data Analysis

Once all data had been collected, the next step was to systematically count, document, and analyze it. This chapter outlines the full process of data analysis. It begins by describing the standardized counting procedure that was established to ensure consistency. This is followed by a discussion of the operationalization process, where we explain how the data were categorized and aggregated to suit different analytical purposes, as well as define the key variables and concepts central to the remainder of the research. Finally, we present the statistical methods employed to conduct the analyses and derive the final results.

3.3.1 Counting Procedure

Given the extensive data collection covering 18 product groups across 21 stores, amounting to over 45 300 individual products recorded, we found it necessary to establish a standardized counting procedure in advance. Since our study investigates both product exposure and shelf positioning, which are analyzed separately, we developed a set of consistent rules to guide the process.

3.3.1.1 Exposure

Our overall approach was to count shelf space based on a fully stocked scenario, that is, how many facings would be visible if the shelves were completely stocked. We also excluded all

temporary displays, focusing exclusively on permanent shelf setups to avoid bias from temporary promotional activities. We chose to count the actual number of facings instead of calculating the percentage of shelf space because, although percentages may seem precise in theory, they are often difficult to apply consistently in practice due to variations in shelf height, depth, and product packaging. Counting facings provides a clear, and comparable measure across various stores and product types. This methodology therefore ensures consistency and comparability across different store formats and conditions.

For most product groups we counted the number of visible facings on the front of the shelves, both horizontally and vertically, to provide a comprehensive measure of shelf allocation (example available in appendix 1). This was the standard method, and was applied in the majority of cases. However for some product types, items were vertically stacked with their fronts facing upward, such as flat spaghetti packages (example available in appendix 2), we decided to count only horizontal facings. This adjustment was necessary due to variations in product packaging and display methods across stores, thus counting only horizontal facings was more accurate in these cases. Moreover, in some cases where products were stored in baskets or on pallets without any structured layout (example available in appendix 3), we estimated their shelf space by considering how many regular shelves the display would occupy. For instance, if a pallet of wheat flour took up the vertical space equivalent to three standard shelves, it was counted as if the flour were displayed accordingly.

Finally we would like to highlight that since retailers vary in how they display certain product types, the counting method also occasionally varies within the same product group. However, by adhering to this standardized procedure, this potentially negative impact from varying displays was countered, and thus ensured accuracy and comparability across varying shelf layouts and consequently reinforcing the validity of our exposure measurements.

3.3.1.2 Positioning

The second part of our study focused on whether retailers favor PLBs by placing them in prime shelf positions. For this purpose, we recorded the results for these shelves in isolation.

Our definition of prime shelf position is informed by previous research, which consistently highlights the shelves located at the shopper's natural line of sight and reach as the most influential for capturing consumer attention and driving purchase decisions (Dréze et al. 1994; Chandon et al., 2009; Nordfält & Ahlbom, 2018; Bianchi-Aguar et al. 2021). In practical terms, this corresponds to the second and third shelves from the top for standard shelf configurations. In cases where shelves are more closely spaced, we expanded the prime zone to include the second, third, and fourth shelves. For product groups commonly stored on half-height shelves, the top two shelves were considered the prime positions.

In some smaller store formats, product groups were so limited in size that they only occupied a half-stature shelf unit. In such cases, vertical positioning could not be meaningfully evaluated, and thus excluded. We also excluded all product groups displayed in chest

refrigerators or freezers, as these units lack vertical shelf differentiation. The categories in this regard were frozen chicken breast fillets, frozen vegetables, and in some cases cheese. However, these products were still included in the exposure analysis, as their total shelf presence remained relevant.

3.3.2 Operationalization

To investigate shelf allocation and the positioning of PLBs compared to MBs, this study focuses on two main dimensions: exposure and favored positioning. Exposure refers to the number of product facings per shelf, while favored positioning assesses where these facings are placed vertically. In the context of positioning we are interested in investigating the potential favoring of PLBs on prime position shelves. These particular shelves are defined as the vertical space equivalent to shoppers' eye- and chest-level.

In order to analyze the data consistently, a total of four variables were documented. For exposure, we recorded (1) the total number of facings and (2) the number of PLB facings. For positioning, we documented (3) the total number of facings in prime positions and (4) the number of PLB facings within those positions. These specific variables enable us to quantify both the overall presence of PLBs and their prominence in more influential shelf locations. Additionally, these variables were documented for each product group, within each respective store. This method of having the data divided by store, makes it possible to analyze the data across multiple aggregation levels.

Given that shelf space should be allocated according to corresponding market share (McGoldrick, 2002; Zentes et al. 2017; Johansson & Hultman, 2024), and shielding being defined as overexposure of PLBs (Walford and Edwards, 1997), we define shielding to occur when the share of PLB facings is statistically higher than the corresponding market share. To determine whether shielding exists, we compared our observational data on PLB shelf share with market share statistics from SCB. This also explains why we documented the data for each product group separately since they all correspond to different market shares. Previous research by Zentes et al. (2017) and Johansson and Hultman (2024) suggests that shelf allocation should be proportionate to market share, making this comparison a valid method for identifying potential discrepancies.

Favoritism on prime shelf positioning is identified when the share of PLBs in eye- to chest level exceeds the share of MBs. In practical terms, if PLBs account for more than 50% of the products placed in these key positions, it indicates a favoring of PLBs on prime shelves.

This study includes three retail chains, encompassing a total of seven store formats, in total 21 stores. To get as encompassing a view of the occurrence of shielding as possible we have decided to look at the phenomena through the lens of three different aggregation levels: (1) the industry perspective, (2) the retail chains, and (3) the store formats.

3.3.2.1 Industry Perspective

The industry perspective provides the highest level of aggregation. This perspective is interesting because it investigates shielding on a general level independent of retail chains or store formats, thus painting the picture of the industry as a whole.

Here we performed the analyses on the entire data set encompassing all 21 stores. This means that we accumulated all the numbers recorded for each of the four variables and for each product group respectively. It is important that we keep the data separated by product group since we need to examine them independently against their corresponding market share.

The following step was to calculate the share of PLB facings overall, as well as the share of PLB facings specifically in prime positions. These were computed by dividing the number of PLB facings by the total number of facings, and similarly for prime positions. To assess shielding in terms of exposure, the share of PLB facings for each product group was statistically compared to the corresponding market share. However, to assess whether or not prime position favoring occurs, the overall market share is not relevant. Instead, the potential favoring of PLBs will be assessed against a benchmark of 50%. The reasoning behind choosing 50% as the benchmark is based on the ratio between PLBs and MBs on these prime position shelves. Intuitively, if PLBs have a prime position share $> 50\%$, there are more PLBs on the shelf than MBs, thus they can be considered favored.

Finally, the number of product groups showing evidence of shielding or favoring was statistically compared to those without such evidence. An important addition here is that we have already proven whether or not shielding exists for each respective product group, the results from this test does not change that. We can however use this test to strengthen the results by providing an overall assessment of whether shielding or favoring can be statistically determined as an intentional strategic move or if there is a possibility that it occurs solely by chance.

3.3.2.2 Retail Chains

One of our purposes for this study is to assess if the occurrence of shielding differs between retail chains. Therefore, we are diving into a lower aggregation level by dividing the data based on the retail chain. To specify, Retail Chain A comprises three store formats, with each format represented by data from three different stores, resulting in data from a total of nine stores. Retail Chains B and C each include two store formats and are thus represented by data from six stores each.

Besides changing the aggregation level, the analysis procedure is identical to the one just described. First each product group was compared against their respective market share for the shielding assessment, and against the benchmark of 50% for assessing potential favoring. Then these results were examined for whether or not shielding and favoring can be determined as being intentional strategies or not.

3.3.2.3 Store Formats

To investigate whether or not the occurrence of shielding differs between store formats, we moved an additional step lower in aggregation. Similar to the analysis conducted on retail level where we divided the data by retail chain, we divided and analyzed the data by store format on this aggregation level. Overall, the procedure followed the same logic as for the overall industry perspective and the retail chain analysis. However, instead of accumulating data for all stores within the entire chain, we only accumulated the data collected from the three stores representing each individual store format.

3.3.2.4 Partial Study Assessing the Temporal Factor on Shielding

This partial study differs from the other two in scope and, to some extent, purpose. As previously mentioned, this part of our research is contingent upon the work of Johansson and Hultman (2024), as it aims to examine whether the exposure of PLBs is affected by a temporal factor. Consequently, we will not assess PLB favoring in this partial study.

To ensure comparability with their research, we isolated and recorded data from the same three product types; cornflakes, vegetable stock, and Swedish falukorv, as Johansson and Hultman. However, although we have chosen to collect our data from the same retail chains, we did not cover the exact same stores, thus limiting the comparability of the analysis of this partial study and excluding the possibility of a paired samples test. Furthermore, the number of total products in the data from 2024, which is rather small compared to our data, also provides some limitations in providing solid results when divided by retail chain.

To investigate whether or not any of the product types are shielded we followed the same procedure as for the other analyses, that is, comparing each product type against their corresponding market share for each retail chain, with the addition of doing it for two separate years. In addition, specific for this partial study, we will also compare the overall occurrence of shielding between the two years. This will be done by comparing the number of shielded product types between the two years, 2024 and 2025, irrespective of which chain of product type they belong to.

3.3.3 Statistical Tests

To ensure the reliability and generalizability of our findings, we decided to statistically analyze the data using appropriate statistical tests. As described in the previous section, the analysis took part in two steps.

The first step was to determine whether or not shielding or favoring exists. Meaning that we needed to compare the share of PLBs in each product group with the corresponding market share, or the benchmark of 50% when assessing favoring. By using statistical tests, it was possible to assess whether the observed values deviate in a statistically meaningful way. This was done for all aggregation levels, as well as for the partial study investigating potential temporal effects, using primarily a *one-proportion z-test* and in some cases, when the assumptions for the z-test was not met, a *binomial test*.

The second step was to further strengthen those results by examining whether or not the occurrence of shielding can be determined to be intentional, and thus be considered a strategic competitive tool, or if there is a chance that shielding occurs by chance and therefore indicates an unintentional act. Similar to the first step, this step applied to all aggregation levels as well as the small partial study, and was tested with a *binomial test*.

Finally, in order to compare the occurrence of shielding between years we needed to add an additional statistical test, namely, *Fisher's Exact Test*.

All of these tests are suitable for analyzing binomial distributions, that is, situations where there are only two possible outcomes. In the context of this study, those outcomes are whether a facing is allocated to a PLB or to a MB. Since retailers only have two brand type options to fill their shelves, PLBs or MBs, there are no other alternatives. This binary setup makes these statistical tests particularly appropriate for the analysis.

3.3.3.1 One-Proportion z-test

A one-proportion z-test is used to compare an observed proportion to a theoretical or expected proportion (Bobbitt, 2020), making it a well fitted test for the first step of our analyses. In the context of this study, the observed proportion (p_o) refers to the PLB share derived from our sample data, while the expected proportion (p_E) corresponds to market share data from SCB (2024), or the benchmark of 50%, depending on if we are analyzing shielding or favoring.

The one-proportion z-test relies on three primary assumptions: (1) that the sample is randomly drawn, (2) that observations are independent, and (3) that the sampling distribution is approximately normal (Diez et al. 2022). According to the Central Limit Theorem, the sampling distribution of proportions approaches normality as the sample size increases, making it less fitting for smaller sample sizes (The Pennsylvania State University, 2024). To verify the normality assumption, the rule of sample proportions is applied. This rule specifies that if both $n \times p_E$ and $n \times (1 - p_E)$ are greater than or equal to 10, the normal approximation is considered valid and the z-test can be applied (Diez et al. 2022). If these three criteria are not met, the assumptions for the z-test are violated, and should not be applied.

Based on our data collection method, we are confident that assumption number one and two are met, however we did test for normal distribution. There were few instances where the assumption of normality was violated. Nevertheless, it did occur, and primarily when comparing product groups where the data was divided by store formats due to fewer products available in the smaller store formats. To control for this violation, we used a binomial test which is better suited for small sample sizes (The Pennsylvania State University, 2024).

The one-proportion z-test yields a p-value, which indicates whether the observed difference is big enough to determine that it is statistically significant. For this study, a significance level

(α) of 0.05 has been set. This means that if the p-value < 0.05 , we can conclude that the difference between the share of PLB and the marker share/benchmark is large enough to determine shielding/favoring, hence the result is considered statistically significant.

The test is performed in two steps, first the z-score is calculated, and then the p-value. This test is possible to perform manually, however due to our large data set as well as this test not being available in the statistics program Jamovi, we decided to use Google Sheets for our calculations. Additionally, since we are only interested in analyzing whether the PLB share is significantly larger than the market share/benchmark, we performed a right-tailed one proportion z-test.

The formulas used are as follows:

$$\begin{aligned} \rightarrow \text{z-score} &= (p_o - n) / \text{SQRT}(n * (1 - n) / p_E) \\ \rightarrow \text{p-value} &= 1 - \text{NORM.S.DIST}(z) \end{aligned}$$

3.3.3.2 Binomial Test

The binomial test is very similar to the one-proportions z-test, however it does not rely on the assumption of normal distribution (The Pennsylvania State University, 2024). This makes it particularly suitable for situations where the normality assumption of the z-test is not met, likely due to small sample sizes.

In this study, the binomial test was employed for two main purposes. First, it was used to substitute the one-proportion z-test for comparing the share of PLBs within the product groups with their corresponding market share/benchmark when the assumption of normality was violated. Second, the binomial test was used to assess whether the number of detected cases of shielding or favoring could reasonably be attributed to chance, or if it could be determined to be intentional. In doing so, we can further solidify the potential occurrence of shielding/favoring, and thus conclude that shielding is intentionally deployed as a strategic tool.

3.3.3.2.1 As a Substitute for the One-Proportion z-test

The binomial test serves as a complementary method to the one-proportion z-test, and its analytical aim remains consistent, that is to determine whether the observed proportion of PLB facings exceeds the expected proportion. Naturally, the right-tailed test and the same significance level ($\alpha = 0.05$) is applied here as well. Also meaning that if the resulting p-value < 0.05 , the difference between the observed PLB proportion and the expected proportion is considered statistically significant.

The test was carried out in two main steps. First, the absolute number of PLB facings for the product group in question, was calculated by multiplying the observed proportion (p_o) by the number of total facings (n) for the product group:

$$\rightarrow |\text{PLB}| = p_o \times n$$

For the exposure analysis, the following Google Sheets function was used to calculate the p-value, using market share/benchmark as the expected proportion:

$$\rightarrow \text{p-value} = 1 - \text{BINOM.DIST}(|\text{PLB}| - 1, n, p_M, \text{TRUE})$$

3.3.3.2 Determining Cases of Intentional Shielding/Favoring

To determine whether shielding is intentionally applied across retail chains and store formats, rather than occurring by chance, we conducted a binomial test on the number of product groups where shielding was detected versus those product groups with undetected shielding. This test value, or benchmark, by which this is determined is 0.5 (50%). This benchmark is decided based on the same principles as for determining PLB favoring. To illustrate, imagine flipping a coin. A coin has two sides, meaning that every time you flip it, there is a 50% chance that the outcome is heads, and a 50% chance that the outcome is tails. If you think about this in the context of our study, there is 50% chance that the outcome is that a product group is shielded, and 50% chance that it is not, thus our expected proportion in this instance is 50%.

The binomial test evaluates whether the observed counts of shielding for the product groups exceeds this chance expectation of 50%. A resulting p-value < 0.05 indicates that the frequency of detected shielding is unlikely due to random variation alone, suggesting an intentional effect across the industry, retail chain or store format.

This test was in contrast to the others, performed in Jamovi. With each store serving as one variable each, and the data input as YES or NO referencing if there is shielding or not for all of the 18 product groups. The test value was set to 0.5, and the hypothesis set was that ($p_O > p_E$).

An additional caveat should be noted. In smaller store formats, it occasionally occurred that no products from a specific product group were placed on the prime shelf positions. As a result, no data on favored positioning could be recorded for these instances. During analysis, such cases were labeled as “NO”, indicating no observed PLB favoring, even though in reality, there was no opportunity for favoring to occur at all.

3.3.3.3 Fisher's Exact Test

This test assesses the association between two binary variables (McClenaghan, 2025). As this test was used for the partial study assessing temporal effects on shielding, where we compared the existence of shielding (yes/no) between two years (2024/2025), this test was a good fit. Furthermore, it works for independent samples, which is necessary due to not collecting data from the same stores, and for small samples, thus countering both limitations mentioned in section 3.3.1.5.

For the partial study we were interested in analyzing any differences between the years, meaning that we do not limit the results to show solely if there is a positive direction like we did before. In this instance it is interesting to know any type of difference, no matter if it

shows increases or decreases, thus performing a two-tailed test. Finally, once again, a statistically significant p-value is < 0.05 .

3.4 Validity and Reliability

In evaluating the validity and reliability of our study, we carefully considered several factors that may have influenced the generalizability and accuracy of our findings.

Firstly, although the Swedish grocery retail landscape is relatively homogeneous, the geographical concentration of the data collection to the Skåne region may have introduced regional biases related to economic conditions, consumer preferences, or cultural norms that could influence store layouts and assortment strategies. Additionally, the exclusion of smaller, independent stores may have restricted the external applicability of our results, as such stores might follow different shelf allocation logics or be driven by other strategic priorities.

Furthermore, the study was conducted within a relatively short time frame during 2025. Therefore, the findings may have been influenced by temporary market conditions, including the ongoing economic downturn and inflation in Sweden. This temporal scope may have overlooked variations due to seasonal fluctuations, promotional campaigns, or short-term adjustments in shelf arrangements. While this constraint was largely due to practical limitations, it may have produced a snapshot rather than a fully comprehensive picture of ongoing practices. Albeit, this limitation was somewhat reduced by the study's deliberate exclusion of temporary promotional activities from the data collection.

Our analysis relied on product groupings defined by SCB, which offers the only available data on market share distribution between PLBs and MBs. These groupings are relatively broad and are therefore not perfectly comparable with the specific product categories analyzed in our study. Nevertheless, SCB's data remained an essential reference point, providing a necessary benchmark for interpreting whether PLBs are overrepresented in shelf allocation. It is also important to note that SCB market share data reflects the previous year due to a one-year reporting lag; the most recent figures available at the time of this study represent market conditions in 2023. While not ideal, this delay does not substantially affect the validity of our conclusions, as market share trends in grocery retail are generally stable over short time frames.

To address potential risks of human error during the counting process, we established a standardized procedure to ensure consistency in how shelf facings were recorded across product groups. Thereby we support and enhance the reliability of our data. While this approach contributed to methodological rigor, a potential limitation remains in that not all product counts were conducted by the same individual or performed jointly. This introduces a risk of minor variation in how individual facings may have been interpreted. To minimize this risk, we reviewed all product groups together before starting to count and double-checked that the counting was done consistently. Given the large overall scope of data collection,

counting over 40 000 individual products, as well as the broad patterns analyzed, we consider it unlikely that small discrepancies at the individual product level would meaningfully affect the overall findings. Nonetheless, we acknowledge this as a methodological consideration and have taken steps to reduce its potential impact on the reliability of our results.

By critically addressing these limitations and applying methodological precision throughout the research process, we aim to provide a robust and credible framework for assessing the presence and implications of shielding in Swedish grocery retail.

3.5 Ethical Considerations

Before initiating data collection, we carefully considered potential ethical concerns associated with our research process. In Sweden, grocery stores are classified as public spaces, which means that photography is generally permitted (Nielsen Norelind, 2020). However, while it may not constitute a legal violation, store managers retain the right to prohibit photography on their premises (Nielsen Norelind, 2020).

After weighing these considerations, we chose not to request formal permission prior to collecting data. Nonetheless, we took several measures to ensure that our research was conducted responsibly and with minimal disruption. We avoided any stores that had explicit signage or policies against photography, carried out all data collection openly (without concealment), and ensured that our presence did not interfere with regular store operations.

To further protect the integrity of the research and the privacy of the stores, we have anonymized store identities in the results section to the greatest extent possible. Given that we did not seek prior approval from individual stores, this anonymization serves as an essential step in safeguarding confidentiality and maintaining ethical standards throughout the study.

3.6 Chapter Summary

This study is grounded in a realist ontology and positivist epistemology, operating on the assumption that an objective reality exists within Swedish grocery retail that can be observed and measured without subjective bias. Adopting a quantitative research approach, the study examines shelf space allocation between PLBs and MBs, enabling comprehensive data collection and rigorous statistical analysis to enhance the generalizability of its findings.

Using a cross-sectional and exploratory design, data were gathered through direct in-store observations across 21 grocery stores in four cities within the Skåne region. The sample included three major retail chains; ICA, Coop, and Willys, and their various store formats. The stores and product groups were strategically selected to reflect market representativeness, focusing on everyday staple products supported by available market share data. Shelf facings and shelf positioning were documented using photographic evidence to capture both exposure and favored positioning.

Shelf exposure and favored positioning was operationalized by counting individual product facings. Four variables were recorded: total facings, PLB facings, total prime-position facings, and PLB prime-position facings. Statistical analyses, including one-proportion z-tests, binomial tests, and Fisher's exact test, were employed to identify significant deviations indicative of practices such as shielding or favoritism. The data was analyzed across different levels of aggregation from the overall industry down to individual retail chains and store formats.

While acknowledging limitations related to the geographic concentration in Skåne, the relatively short temporal scope of data collection, and the general classification of market share data sourced from SCB, the study took several measures to ensure validity and reliability. Standardized counting procedures were carefully developed and reviewed to promote consistency, temporary promotional facings were excluded to reduce variability, and the large sample size of over 40,000 individual product counts helped minimize the impact of minor discrepancies, thereby supporting the robustness of the findings.

Ethical considerations were also carefully addressed. Data collection took place openly in public retail environments without seeking formal prior permission, in line with Swedish regulations allowing photography in public spaces. Stores with explicit prohibitions on photography were avoided, and all observations were conducted transparently to minimize disruption. To maintain confidentiality and uphold ethical standards, store identities have been anonymized throughout the reporting of results. Through this thorough and careful approach, the study aims to provide a credible and comprehensive assessment of shelf space dynamics and retailer practices in Swedish grocery retail.

4. Results

This chapter presents the results and findings from our study. This section consists of results based on statistical testing, as well as observed patterns concluded from these results.

Based on data collected from 21 stores, representing seven different store formats across three retail chains, we investigated the occurrence of PLB shielding. In line with the study's objectives, the results chapter is divided into two main sections: exposure and favored positioning. Exposure is defined as the proportion of PLB facings relative to the total number of facings across the entire shelf display, while favored positioning refers to the proportion of PLBs placed on prime shelf positions.

Since the occurrence of shielding is determined by a statistically significant difference between the share of PLBs for each product group, and their corresponding market share, we will start this result section by looking at an overall summary of this across three different aggregation levels; (1) across all stores, meaning that the data from all 21 stores has been accumulated, (2) by retail chain, meaning the data from the 21 stores has been divided according to chain affiliation, and (3) by store format, meaning the data has been divided according to format type within each retail chain. This result will clearly showcase if retailers overexpose their PLBs, in other words if shielding exists or not.

To further support our findings, we conducted an additional statistical test aimed at assessing whether the observed PLB shielding could be considered a deliberate strategic action by retailers. It is important to emphasize that this test does not determine whether shielding occurs or not, we have already established that separately. Instead, this test serves to evaluate whether the frequency of employed shielding across all product groups, for the three aggregation levels, are statistically significant enough to suggest a consistent, intentional strategy, rather than random or unintentional occurrences. In other words, this test aims to prove whether or not shielding is used to an extent where it is unlikely to occur unintentionally. Even if this test yields a non-significant result, it does not invalidate the evidence of shielding already identified within specific product groups. It simply means we cannot confirm that the observed behavior is intentional at a broader strategic level.

Next we will present the findings for positioning, that is if retailers favor their PLBs on the prime position shelves situated between shoppers' eye- and chest level. We will follow the same methodology as described above for exposure.

Finally, we will present the results from the partial study examining temporal effects on shielding.

4.1 Exposure Shielding

	TOTAL	RC A	RC B	RC C	SF A1	SF A2	SF A3	SF B1	SF B2	SF C1	SF C2
Milk	✓		✓	✓				✓	✓	✓	✓
Cheese											
Butter											
Liquid Margarine	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Oil	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rice	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pasta	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bread				✓					✓		✓
Oats	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Flour	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cereal	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Filtered Coffee	✓		✓	✓					✓	✓	✓
Minced Meat	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Meatballs	✓	✓	✓	✓	✓			✓	✓	✓	✓
Sausages		✓				✓					
Stocks and Stock Cubes	✓		✓	✓	✓			✓	✓	✓	
Frozen Chicken Breast				✓						✓	✓
Frozen Vegetables	✓	✓		✓	✓	✓	✓			✓	✓
Total of 18	13	11	12	15	11	10	9	11	13	14	14

Table 4.1: Illustration of shielded product groups across the entire industry (total), the retail chains (RC), and store formats (SF) within each respective retail chain.

The table 4.1 above illustrates all statistically significant occurrences of shielding for all aggregation levels combined. We have tested 198 individual cases, of which 133 show an occurrence of shielding, a total of 67.2%. These findings mean that we have proven that retailers overexpose their PLBs for multiple and various product groups across all three aggregation levels; the grocery retail sector as a whole, divided by retail chains, and even on store format level. In other words, shielding does exist.

Several noteworthy patterns emerged from our analysis. Specifically, we observed that certain product groups are consistently subject to shielding, regardless of the level of aggregation. These consistently shielded product groups include liquid margarine, oil, rice, pasta, oats, flour, cereal, and minced meat. In contrast, cheese and butter consistently showed no evidence of shielding across all examined contexts.

4.1.1 Exposure Shielding: Strategy or Incidental?

	TOTAL	RC A	RC B	RC C	SF A1	SF A2	SF A3	SF B1	SF B2	SF C1	SF C2
Shielded Product Groups out of 18	13	11	12	15	11	10	9	11	13	14	14
p-value	0.048	0.24	0.119	0.004	0.24	0.407	0.593	0.24	0.048	0.015	0.015
Intentional Strategic Shielding	YES	NO	NO	YES	NO	NO	NO	NO	YES	YES	YES

Table 4.2: Illustration of intentional shielding across the entire industry (total), the retail chains (RC), and store formats (SF) within each respective retail chain.

As previously mentioned, we conducted additional tests to assess whether the observed shielding could be considered intentional, and thereby a strategic competitive move, or if it might simply occur by chance. As shown in Table 4.2, this intentionality could be statistically determined in 5 out of the 11 cases analyzed.

An interesting finding is that Retail Chain C stands out as the only chain where shielding can be deemed intentional both at the chain level ($p = 0.004$, < 0.05) and across both of its store formats (each with $p = 0.015$, < 0.05). This strongly suggests a deliberate strategy by Retail Chain C to enhance the visibility of its PLBs through consistent and intentional shielding practices.

Moreover, our findings show that we also can prove intentional shielding for the smaller store format for Retail Chain B (SF B2) with $p = 0.048$ (< 0.05).

Finally, when analyzing the results related to the intent behind shielding from an industry-wide perspective (TOTAL), we find that the outcome is statistically significant ($p = 0.048$). This indicates that, when aggregating data from all 21 stores included in the study, the prevalence of shielding is substantial enough to be interpreted as intentional rather than random. Consequently, our findings support the conclusion that shielding is deliberately employed as a strategic competitive tool within the Swedish grocery retail industry.

4.2 Favored Positioning

	TOTAL	RC A	RC B	RC C	SF A1	SF A2	SF A3	SF B1	SF B2	SF C1	SF C2
Milk			✓					✓	✓		
Cheese											
Butter											
Liquid Margarine											
Oil				✓							✓
Rice	✓	✓			✓	✓	✓				
Pasta											
Bread											
Oats						✓			✓		✓
Flour											
Cereal											✓
Filtered Coffee											
Minced Meat	✓	✓	✓	✓	✓	✓		✓	✓	✓	
Meatballs											
Sausages											
Stocks and Stock Cubes											
Total of 16	2	2	2	2	2	3	1	2	3	1	3

Table 4.3: Illustration of product groups with favored PLBs across the entire industry (total), the retail chains (RC), and store formats (SF) within each respective retail chain.

The results related to positioning are not as conclusive as those concerning exposure. As shown in Table 4.3, there are some instances where retailers favor PLBs on prime shelf positions, but this was observed in only 23 out of 176 cases, representing a modest 13.1%. Nonetheless, certain noteworthy patterns emerge.

Rice is one such product group where Retail Chain A consistently favors PLBs. This is evident both at the chain level ($p = 0.001$, < 0.05) and across all three store formats (A1–A3), with p-values equal to 0.006, 0.005, and 0.000, respectively. A similar pattern appears for milk in Retail Chain B, where favoring of PLBs is statistically significant both for the chain overall ($p = 0.000$) and for each store format (B1: $p = 0.000$, B2: $p = 0.001$).

Finally, we would like to highlight the consistent favoring of minced meat. However, this pattern is unlikely to reflect a deliberate positioning strategy for PLBs. Instead, it appears to be a consequence of PLB minced meat occupying more than 90% of the shelf space across all the stores included in the study. In this case, the observed favoring is more likely a by-product of PLB shelf dominance rather than an intentional strategic display decision.

4.2.1 Favoring Positioning: Strategy or Incidental?

	TOTAL	RC A	RC B	RC C	SFA1	SFA2	SFA3	SFB1	SFB2	SFC1	SFC2
Product Groups with Favored PLBs out of 16	2	2	2	2	2	3	1	2	3	1	3
p-value	1	1	1	1	1	0.998	1	1	0.998	1	0.998
Intentional Strategic Favoring	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Table 4.4: Illustration of intentional favoring across the entire industry (total), the retail chains (RC), and store formats (SF) within each respective retail chain.

Despite some product groups showing favoring of PLBs, we could not find any evidence that this favoring is intentional. As illustrated by table 4.4, the p-values are consistently close to 1 across all cases, indicating that there is no statistically significant pattern of systematic favoring by retailers. In other words, any observed favoring of PLBs in product positioning appears to be random rather than strategically motivated.

4.3 Partial Study: Assessing the Temporal Factor on Shielding

	RC A -24	RC A -25	RC B -24	RC B -25	RC C -24	RC C -25
Cornflakes	✓	✓	✓	✓	✓	✓
Falukorv	✓	✓	✓	✓	✓	✓
Vegetable Stock			✓	✓		✓
Total of 3	2	2	3	2	2	3

Table 4.5: Illustration of shielded product types across the retail chains (RC) for two years, 2024 and 2025.

The comparative analysis between Johansson and Hultman's 2024 study and the current research reveals no significant difference in the overall occurrence of shielding between the two years ($p = 1$).

However, as shown in Table 4.5, some product-level differences emerge for two of the retail chains. Between 2024 and 2025, Retail Chain B stopped shielding Swedish falukorv, while Retail Chain C began shielding vegetable stock, which they had not done previously.

These findings suggest that shielding remains a consistent practice overall, but no further conclusions can be drawn from these variations.

4.4 Chapter Summary

To summarize the results chapter, we conclude that shielding does indeed occur within the Swedish grocery retail industry across multiple and diverse product groups. Moreover, we demonstrate that it is used intentionally as a strategic maneuver, meaning the occurrence of shielding is substantial enough to be interpreted as intentional rather than random, both across

the industry overall, as well as by Retail Chain C in all examined instances, and by Retail Chain B in its smallest store format.

In contrast, we cannot establish intentional favoring of PLBs on prime shelf positions by retailers. Nonetheless, Retail Chain A consistently favors its rice PLBs, while Retail Chain B favors its milk PLBs.

Finally, no significant temporal changes in shielding were found.

5. Analysis and Discussion

This chapter presents an analysis and discussion of the study's findings framed around the research purposes and the study's two key dimensions; exposure and favored positioning. Here we interpret and discuss the findings in the context of previous research and market dynamics. The chapter also discusses the implications of shielding, as well as the generalizability and relevance of the research.

5.1 Discussing the Results for Shielding

The primary purpose for this research was to investigate whether or not shielding occurs in the Swedish grocery retail sector. Based on our findings we can conclude that shielding does in fact occur, and quite extensively so. 67.2% of all individual cases analyzed in our research show statistically significant proof of shielding. We can thus statistically conclude that retailers provide more shelf space to their PLBs than what is justified by market shares. Deviations like these are indicative of retailers pushing preferred brands, such as PLBs, beyond what consumer demand alone would dictate (McGoldrick, 2002). This research's findings thereby validates the concerns raised by manufacturers (Håkansson, 2000; Johansson & Hultman, 2024) and researchers (Chakraborty, 2018; Wu et al. 2021). By extension, this reveals that retailer assurances of shelf allocations based strictly on market share (Johansson & Hultman, 2024) are not upheld. In other words, retailers shield their PLBs.

Adhering to one of the sub-aims of this research, which was investigating shielding across retail chains, we cannot prove an intentional use of shielding for more than one out of the three retail chains. Although all retail chains perform shielding for the majority of the product groups studied, only Retail Chain C can be statistically proven to deliberately use shielding, suggesting a systematic use of shielding as a strategic tool. Why Retail Chain C is the sole case of proven shielding remains speculative. However, it could plausibly relate to Chain C's low-price orientation. Given that PLBs typically occupy the lower price spectrum (Ndlovu, 2024), it is reasonable to infer that such a retail profile would more aggressively promote its own brands through increased shelf exposure.

We also endeavored to investigate the occurrence of shielding across store formats. Based on Nordfält's (2009) study, which suggested that consumers are more susceptible to in-store stimuli during fill-in trips, we had an inclination to hypothesize that smaller store formats would exhibit more pronounced shielding, given the assumption that fill-in trips are generally conducted in smaller stores closer to home. However, no such pattern can be confirmed based on the results of this study. The only retail chain that followed this pattern was Retail Chain B, for which we found proof of intentional shielding. Retail Chain C was also proven to intentionally shield their smaller store format, however the same was true for their larger store format. With that said, we could speculate that since Retail Chain B did not show overall intentional shielding, but did so for their smaller store format, it could imply that they have a higher inclination to shield smaller store formats. However it is not something that we can confidently confirm based on the results of this study.

5.1.1 Discussing Patterns of Shielded Product Groups

As mentioned in the results chapter, we observed noteworthy patterns in which some product groups were consistently shielded and some were not. Certain staple product groups, namely liquid margarine, oil, rice, pasta, oats, flour, and cereal exhibited shielding across all aggregation levels.. On the contrary, cheese and butter were two product groups that did not show any proof of shielding for any aggregation levels. While we cannot say for sure why these patterns showed, we can offer some speculative reasoning.

Although our dataset predominantly consists of everyday grocery items, the product groups consistently shielded may be considered more basic or low-involvement goods. In other words, consumers may care less about brand differentiation when purchasing these types of products compared to products like cheese or butter where personal taste, texture, and quality perceptions may lead to stronger brand preferences.

Price could also be a contributing factor. Cheese and butter tend to be more expensive compared to the product groups where shielding is observed (with the possible exception of oil). When consumers choose to purchase cheese or butter, they may already expect to pay a higher price, making the marginal difference between brands less significant and increasing the likelihood of brand loyalty. If this is the case, it could suggest that cheese and butter brands are perceived as stronger or more differentiated than, for example, oats or flour brands. These might also be categories where consumers are more willing to indulge in premium choices, meaning they are less sensitive to price and therefore less affected by the economic pressures described by Anna Ekström, Managing Director Nordics at NielsenIQ (Svensk Dagligvaruhandel, 2024a), and Lesniak et al. (2023). Both sources highlight how the recent economic downturn has reduced consumers' purchasing power and led to a rise in PLB purchases, an effect that may be more pronounced in lower-involvement or price-sensitive categories.

Finally, the number of available brands in each category may also play a role. Cheese and butter are often sold under numerous MBs, intensifying the competition for shelf space. In contrast, categories such as flour and oats typically have fewer competing MBs, potentially making them easier targets for shielding practices by retailers seeking to promote their PLBs.

5.2 Discussing the Results for Favored Positioning

Unlike the results for shielding, which we could confidently confirm the existence of, there is no such proof of retailers favoring PLBs on prime shelf positions.

Speculatively, the scarcity of proven positioning shielding might be due to the strategic trade-off retailers make to maintain MB relationships. While previous research states that increased number of facings can enhance visibility and thereby boost sales (Drèze et al. 1994; Nierop et al., 2008; Chandon et al. 2009). The supremacy of vertical positioning is emphasized by Nordfält and Ahlbom (2018) who state that eye- to chest-level shelf positioning is superior to an increase in exposure. Thus, the most efficient way of shielding

for retailers would be to focus on prime positions over increased exposure, albeit our results state the actual behavior as the opposite. We can not say for certain why this is, however one potential reason could be that retailers may give up prime shelf positions for MBs while overexposing PLBs through additional facings. This could potentially be a tactic to avoid alienating MB suppliers, who are still critical traffic drivers (Anselmsson & Johansson, 2013; Johansson & Hultman, 2024). This is a strategy possibly perceived as less overtly aggressive and also supported by Burke and Leykin (2014) who show that the impact of facings is more pronounced in suboptimal positions, allowing retailers to compensate for less favorable shelf locations.

5.3 The Practical Implications of Proven Shielding

The most immediate implication of shielding is a likely increase in sales for PLBs. Given the evidence from Nordfält and Ahlbom (2018) and Zentes et al. (2017), visibility on the shelf has a direct impact on consumer behavior. Most purchases are made in-store, often within seconds, meaning that increased shelf prominence alone can drive selection, regardless of underlying brand preference. This current research, with its proven occurrence of shielding, substantiates the reports from McGoldrick (2002), Dobson and Chakraborty (2015), and Johansson and Hultman (2024) that retailers in fact do use their power and control to manipulate the retail space however they prefer. By implementing shielding, a self-reinforcing cycle is started in which the increased visibility leads to more sales, which results in higher market share and, in turn, justifies even more visibility. Although some of the PLB growth is organic (Svensk Dagligvaruhandel, 2024a), these findings indicate that the growth might not necessarily be entirely because of changing consumer preferences, but rather due to retailer's manipulation of the retail environment. While shielding has obvious benefits for the retailers themselves such as increased profitability (Sayman, 2002; Steiner, 2004; Dobson & Chakraborty, 2015; Wu et al. 2021), and decreased dependency on MBs (McGoldrick, 2002), this strategy is not without risk. A key concern is the question about fair competition.

A key norm in retail is that shelf space should reflect market share (McGoldrick, 2002; Zentes et al. 2017), which is assumed to directly indicate customer demand. However, shielding intentionally violates this principle. Retailers overexpose PLBs despite them having lower market shares than many MBs. This distortion introduces two major risks. First, if MBs with proven popularity are underrepresented on shelves, consumer needs may not be met, potentially leading to frustration or defection to competing retailers (Anselmsson & Johansson, 2013; Johansson & Hultman, 2024). Second, PLB growth driven by overexposure may not accurately reflect a genuine shift in consumer preference but could instead be the product of forced visibility, thus distorting the perception of actual demand. Despite these concerns, it remains unlikely that shielding alone will lead to the outright loss of MBs. Retailers depend heavily on MBs, particularly market leaders that consistently generate high sales volumes and act as traffic drivers (Anselmsson & Johansson, 2013; Johansson & Hultman, 2024). As such, retailers are highly unlikely to push shielding so far that they alienate these core suppliers. What is perhaps more likely is that less established MBs bear

the brunt of restricted access and shelf space. These brands may find themselves edged out not because of consumer rejection, but because they cannot secure enough exposure to prove themselves in the first place.

This raises concerns about fair competitive dynamics in the Swedish retail sector. While PLBs may not be systematically favored in prime shelf positions, they are still overexposed relative to their market share. This visibility advantage can significantly skew the playing field. New or niche MBs, despite potentially offering strong products, may struggle to achieve similar levels of exposure, making it more difficult to gain traction. The result is a reinforcing loop in which PLBs dominate through overexposure, their sales justify continued presence, and newcomers or less established brands face a steeper climb to prove viability. It is likely that this does not just affect individual brands, it could potentially lead to raised structural barriers to entry by retailers establishing even more power over assortment, and thus shrinking the competitive landscape.

Even if major MBs are not removed, they may still feel the indirect pressures of shielding. As PLBs gain market share, regardless of whether that growth reflects genuine consumer preference or artificial inflation via shielding, retailers gain greater bargaining power (McGoldrick, 2002; Dobson & Chakraborty, 2015; Wu et al. 2021). This could potentially lead to MBs facing higher costs, stricter conditions for in-store activations, and reduced influence on decisions regarding how their products are promoted in-store. Nevertheless, even if MBs are heavily reliant on the retailers, they recognize their own indispensability, particularly the top performers. This relationship is reflected in the retailer's role as customers (Dobson & Chakraborty, 2015; Chakraborty, 2018), and there is a limit to how aggressively retailers can push the MB suppliers.

If tensions escalate and MBs perceive exploitation, retailers run the risk of losing them altogether. However, this outcome is a very drastic one and it is more likely to be a possible outcome if there are no other options as the manufacturers' risk losing both customer access and market shares (Dobson & Chakraborty, 2015; Chakraborty, 2018). The implications of such a withdrawal are serious. Retailers may suffer loss of customer trust and foot traffic, particularly from loyal MB buyers (Chakraborty, 2018; Johansson & Hultman, 2024). The overall variety of the assortment may diminish, which is a critical factor in store choice (Zentes et al. 2017). A consequence from this is possible reputational damage to the retailer's brand. As Jens Hultman notes, increased PLB share may not reduce assortment breadth per se, but it does narrow brand variety (Larsson, 2024). While shoppers may still see a range of price and quality levels, the absence of trusted MBs can undermine satisfaction. It cannot be ignored that customers expect to find these brands in their preferred stores, as Johansson and Hultman (2024) point out.

5.4 Generalizability and Relevance of Findings

Our results are based on extensive data collection across 21 stores, documenting over 40,300 individual products. The inclusion of both large and small store formats, as well as variation

across different urban areas and cities, strengthens the generalizability of the findings. The consistency of observed patterns across these varied contexts reduces the likelihood that the results occur by chance or represent isolated cases. Ultimately, the considerable breadth and depth of the dataset enhance the credibility and robustness of the findings, supporting their applicability across the broader grocery retail industry.

Beyond generalizability, the study's findings are highly relevant in a societal context. On average, Swedish households allocate on average 13,4% of their disposable income to food (Svensk Dagligvaruhandel, 2024b), which makes grocery retail a significant part of consumer expenditure. As most purchases are made in-store (Svensk Dagligvaruhandel, 2024b) and often influenced by shelf visibility (Drèze et al. 1994; van Nierop et al. 2008; Chandon et al. 2009; Dobson & Chakraborty, 2015), understanding how shelf space is allocated is critical. Strategic exposure of PLBs has direct implications for what consumers see, how they spend, and ultimately which products they choose. Given the economic significance of food purchases, retailers may use shelf allocation to influence these choices in favor of their own brands, thereby strengthening their market position. This underscores the practical relevance of shielding and the need to understand how shelf allocation shapes customer behavior.

5.5 Chapter Summary

This chapter provides a comprehensive discussion of the study's main findings regarding the practice of shielding in the Swedish grocery retail sector. The research confirms the presence of shielding, showing statistically significant evidence that retailers allocate more shelf space to their PLBs than is justified by market share. This challenges the notion that shelf space is fairly distributed according to consumer demand, and aligns with concerns raised by both manufacturers and previous researchers.

Among the three studied retail chains, only Retail Chain C demonstrated an intentionally strategic use of shielding, likely connected to its low-price profile. The study also explored store format differences, hypothesizing greater shielding in smaller formats based on consumer susceptibility to in-store stimuli. The analysis further identified consistent product group patterns. Basic staples are frequently shielded across all contexts, in contrast to more expensive or brand-sensitive categories like cheese and butter, which are not shielded. These differences may reflect variations in consumer brand loyalty, price sensitivity, and market structure, with cheese and butter often having more diverse brand offerings and being seen as higher-involvement purchases.

In contrast to the strong evidence for shielding, the study did not find conclusive proof of favoring PLBs through prime shelf positioning. A potential explanation is that retailers may strategically avoid reallocating prime positions to maintain good relationships with major brand suppliers, opting instead to boost PLB visibility through increased facings in less sought after areas of the shelf.

The practical implications from this research are substantial. Shielding can artificially inflate PLB sales, not through consumer preference, but through increased visibility, creating a self-reinforcing cycle of exposure and growth. While advantageous for retailers, this behavior raises questions about market fairness, particularly for new or smaller manufacturer brands that struggle to secure shelf space.

Finally, the chapter emphasizes the broader societal and market relevance of these findings. With food being a major household expense and most purchases made in-store, how shelf space is allocated has real-world consequences on consumer choice and competition. The study's broad data collection across retail chains, store formats, and product groups strengthens both the credibility and generalizability of its findings, highlighting the critical role of shelf strategies in shaping retail dynamics.

6. Conclusion

The primary aim of this study was to investigate whether Swedish grocery retailers engage in shielding strategies to enhance the shelf presence and visibility of their private label brands. Specifically, the study sought to determine whether shielding, defined as the disproportionate allocation of shelf space to PLBs in comparison to their market share, occurs within the Swedish grocery retail sector. This was assessed through two dimensions: exposure, referring to the share of PLB facings relative to market share, and favored positioning, denoting the share of PLBs in prime shelf positions relative to manufacturer brands.

In addition to this primary purpose, the study was structured around three central research objectives. First, it sought to determine whether shielding occurs across different retail chains by analyzing both exposure and favored positioning. Second, it examined the presence of shielding across various store formats, again through the lenses of exposure and favored positioning. Third, it compared the findings of this study with those of Johansson and Hultman (2024) to assess whether the extent of PLB exposure has changed over time. Collectively, these objectives guided the study in providing a comprehensive and data-driven account of how shelf space may be strategically used to benefit PLBs in the Swedish grocery market.

With this restatement of the research purpose as a foundation, we now present a final summary of the study's key findings. This will be followed by a discussion of this research's theoretical and practical contributions. This chapter, and the thesis, will conclude by outlining suggested avenues for future research.

6.1 Final Conclusion of the Main Findings

This study presents clear evidence that PLB shielding is a prevalent practice within the Swedish grocery retail industry. We found multiple statistically significant signs of exposure shielding across all aggregation levels, meaning industry wide, across all retail chains, and across all store formats, thus confirming the presence of shielding in terms of exposure with PLBs found to consistently occupy shelf space at levels exceeding their market share. Importantly, the findings also indicate that shielding is, in some cases, employed deliberately and strategically. This was statistically supported by demonstrating that the number of shielded product groups was sufficiently high to make incidental occurrence unlikely.

However, when analyzing our second key measure for shielding, favored positioning, the results were not as validating. By contrast to exposure shielding, no evidence of intentional favoring of PLBs in prime shelf positions was found. While some product-level patterns emerged, for example, Retail Chain A favoring PLB rice, and Retail Chain B favoring PLB milk, these were isolated instances and did not reflect a broader strategic trend. These findings suggest that increased exposure, rather than favored positioning, may be the primary tool retailers use to enhance the in-store visibility of PLBs.

Finally, the temporal analysis revealed no meaningful changes in shielding between 2024 and 2025.

6.2 Contributions

This study makes several important contributions to the understanding of competitive dynamics between PLBs and MBs in the Swedish grocery retail sector, with a particular focus on the underexplored phenomenon of shielding.

First, this research addresses a notable empirical gap in the literature by providing a large-scale study across 21 stores and 18 staple product groups. Prior research has extensively examined the rivalry and competition between PLBs and MBs, however, the concept of shielding has remained largely abstract with limited real-world evidence of its existence or strategic use (see for example, Chakraborty, 2018; Wu et al. 2021; Fernandez Nogales & Gomez Suarez, 2005; Johansson & Hultman, 2024). For instance, the only previous Swedish study by Johansson & Hultman (2024) was based on three product types, whereas we have expanded this number to 18 product groups. Through this expansion, this study offers a more comprehensive and generalizable picture of actual in-store practices.

Second, this study contributes methodologically by providing the first study to apply statistical testing of shielding in the Swedish context. In doing so, it substantiates theoretical assumptions, by not only showing shielding to be prevalent but also statistically significant across multiple chains and formats. Conversely, the absence of significant evidence for favored positioning as a strategy offers a nuanced contribution suggesting that retailers might favor exposure over prime positioning to enhance visibility of their PLBs.

Third, beyond confirming the presence of exposure shielding, the study contributes to a more nuanced understanding of the retailer's dual role as both distributor and competitor (Chakraborty, 2018; Wu et al. 2021). The findings illustrate how this role allows retailers not just to influence market conditions, but to actively shape and distort them. In this light, shelf space emerges as more than a marketing tool, it becomes a strategic resource used to control visibility, steer consumer choice, and reinforce PLB dominance.

Taken together, these findings advance the theoretical discourse on retail competition by grounding the previously abstract concept of shielding in directly observed and statistically validated retail practices.

From a practical perspective, the results are relevant for retailers, manufacturers, and policymakers alike. They provide a foundation for assessing the fairness and transparency of current shelf space practices and raise important questions about how retail environments can be used to influence market outcomes. By shedding light on a behavior that has long been assumed but rarely demonstrated, this study may inform future debates around competition policy, industry self-regulation, and the evolving role of PLBs in shaping grocery retail markets.

6.3 Future Research

While this current study provides important insights into the occurrence of shielding in the Swedish grocery retail industry, several avenues remain open for further exploration.

First, a natural progression from this research would be to investigate the underlying mechanisms behind the patterns we have observed. This includes gaining insight into the decision-making processes within retail organizations that lead to shielding strategies. Qualitative methods such as interviews with category managers or in-store merchandisers could offer a deeper understanding of whether these strategies are top-down directives, emergent practices, or the result of broader organizational objectives. In addition, exploring the consumer perspective would provide an essential complement to our retailer-focused analysis. Future research could examine whether customers perceive differences in product visibility or availability and whether shielding influences their purchasing behavior, either consciously or subconsciously.

Second, there is value in expanding the geographic scope of the study. Our current research is limited to a defined region of Sweden, by replicating the study across a broader range of locations within the country would improve generalizability and reveal potential regional variations. Furthermore, conducting similar studies in other international markets, particularly those with different retail structures, levels of PLB penetration, or regulatory environments, could illuminate how shielding practices differ across markets and competitive contexts.

Finally, additional more expansive studies are needed to study the temporal effects on shielding. Our research primarily provides a snapshot of current practices, with the exception of a small comparative study between the years of 2024 and 2025. A long-term perspective would reveal whether shielding strategies are stable, cyclical, or reactive to market changes such as price inflation, supply chain disruptions, or shifting consumer preferences. Tracking these developments would offer valuable insights into the durability and adaptability of shielding as a strategic tool.

In sum, future research should strive to move from identifying the existence of shielding to understanding its drivers, consequences, and evolution, thereby providing a more holistic view of its role in shaping retail competition.

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Declaration of AI Use

We have primarily used AI for the improvement of language. More specifically we have used prompts such as:

- Can you help me rephrase this sentence/paragraph to aid clarity: ...
- Can you check the structure of this paragraph: ...
- Look for misspellings in this text: ...

This method was used to improve our academic writing, to make grammatical corrections, and to provide text that is straightforward, concise, and thus easier to understand.

We have also used AI to assist with synonyms or word translations when we have been unsure. For these purposes, prompts like the following were used:

- Can you provide synonyms for the word ... ?
- Can you translate the word ... from Swedish to English?

Finally, we used AI to get ideas on which statistical methods that could be used for our research purpose. In order to anchor the AI-generated suggestions, we used additional sources, as well as feedback from our methods supervisor.

Appendix

Appendix 1. Example of a normal shelf.



Appendix 2. Example of items vertically stacked with their fronts facing upward.



Appendix 3. Example of products stored on pallets and baskets.

