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Unlocking Market Potential: Strategic Consumer Segmentation and Dynamic Pricing for Balancing Loyalty and Deal Seeking

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Abstract: Background: This paper examines the economic implications of market segmentation on consumer purchasing behavior with a particular emphasis on intertemporal pricing strategies in dynamic markets. Methods: In order to analyze optimal discount rates and the timing for price reductions for consumer segments, including loyal and deal-prone customers, a detailed mathematical model was developed. The model incorporates theories of consumer behavior and pricing elasticity to simulate market responses to price changes throughout a product's lifecycle. Results: This research indicates that market segmentation enhances sales by targeting the distinct preferences of loyal consumers, who are less price-sensitive and who stabilize revenue streams, and deal-prone consumers, who respond to price reductions. Customizing pricing strategies for loyal consumers and deal-prone consumers increases sales volumes and optimizes profitability. Conclusions: This research improves our comprehension of market segmentation and dynamic pricing, providing a practical framework for businesses to create effective pricing strategies that can be promptly implemented. It emphasizes the significance of understanding consumer behavior and price sensitivity in the interest of revenue promotion. This study also emphasizes the social implications of equitable pricing practices, promoting the implementation of transparent and value-based strategies to promote market inclusivity and consumer trust.

Keywords: market segmentation; intertemporal pricing; consumer behavior; pricing strategy; consumer loyalty; deal proneness; economic modeling

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1. Introduction

In today's rapidly evolving and highly competitive market environments, businesses are under increasing pressure to develop effective strategies that align with fluctuating consumer demands and to enhance profitability. The strategic applications of intertemporal pricing and market segmentation are among the most critical instruments for attaining these objectives. Market segmentation involves dividing a broad consumer base into distinct groups based on shared characteristics, enabling businesses to more precisely target specific segments [1,2]. Conversely, intertemporal pricing emphasizes the necessity of adjusting prices over time to accommodate market conditions, consumer behavior, and demand cycles [3,4]. Together, these strategies establish a dynamic approach that enables businesses to maximize their long-term market presence as well as their short-term revenue [5,6].

Market segmentation and intertemporal pricing strategies are critical for targeting specific consumer categories, particularly loyal and deal-oriented customers. While prior research has thoroughly examined the individual behaviors of these groups, it often neglects the dynamic interactions between them, which evolve as pricing strategies change over time [7]. The absence of this consideration is a notable issue, since companies must

progressively use dynamic pricing strategies that balance securing revenue from loyal customers with enhancing sales from price-sensitive buyers [8]. The rapidly changing market dynamics highlight the practical ramifications of this issue, offering significant insights into pricing strategies.

In this study, the economic implications of implementing market segmentation and intertemporal pricing strategies with relation to consumer purchasing behavior are thoroughly examined. In particular, it underscores the potential of these strategies to engage two critical consumer segments: loyal customers, who are often less sensitive to price fluctuations, and deal-prone customers, who are highly responsive to promotions and discounts [7,9]. This study offers valuable insights into the significant impact that strategic price adjustments can have on consumer behavior, sales optimization, and overall profitability by examining how businesses can develop pricing strategies that accommodate the unique preferences of these groups [9].

This study is based on a comprehensive mathematical model that is intended to simulate market responses under varying pricing conditions. The model facilitates the investigation of the most effective discount rates and the timing of price reductions, which are essential to achieving sustained profitability and maximizing sales volumes [6,7]. This research aims to offer businesses a practical framework for making informed decisions about when and how to adjust prices to suit the requirements of various consumer segments. This is especially important in sectors where customer behavior is highly variable, necessitating pricing strategies that are adaptable enough to attract both price-sensitive purchasers and high-value, brand-loyal customers [2]. The practical implications of this research will provide businesses with the required instruments to navigate the complex dynamics of the market [10].

In dynamic markets, where consumer preferences are constantly changing and competition is fierce, the capacity to influence purchasing behaviors through targeted segmentation and pricing strategies is essential. The objective of this investigation is to enhance this comprehension by conducting a thorough examination of the impact of segmentation strategies on sales volumes and the effective use of pricing adjustments by businesses to appeal to various segments at the appropriate moment. This study also investigates the broader implications of these strategies on profitability by concentrating on optimal discount rates and the timing of price reductions. This elucidates how businesses can maintain a competitive edge and promote long-term growth by utilizing market segmentation and intertemporal pricing [2,7,11].

This paper is organized as follows:

Section 1 introduces the research objectives, identifies gaps in the existing literature, and emphasizes the novelty of this study. It outlines how market segmentation and intertemporal pricing affect consumer purchasing behaviors across various segments. This section underscores this study's emphasis on customizing pricing strategies to appeal to loyal and deal-prone consumers. It also introduces the primary inquiries that this research intends to address, including optimal discount rates and the timing of price reductions.

Section 2 offers a thorough examination of pertinent literature, with an emphasis on the primary literature concerning intertemporal pricing strategies and market segmentation. This section identifies deficiencies in existing research, particularly in the incorporation of pricing strategies for both loyal and deal-prone customers. It also addresses the constraints of current models, which frequently neglect to consider the dynamic interplay between consumer groups or do not adequately address the timing of pricing changes in fluctuating market environments.

The system model is presented in Section 3, which provides a comprehensive explanation of the mathematical framework employed in this investigation. It introduces the symbols and parameters essential for comprehending the model, including price elasticity, demand curves, and time-based variables. The model is also predicated on well-defined assumptions like market conditions and consumer behavior patterns. This section provides

the reader with the requisite context to comprehend the model's ability to capture the dynamics between loyal and deal-prone consumers over time.

Section 4 delves into the model's implementation and offers proof of correctness to verify its theoretical validity. Furthermore, this section provides simulation results, which demonstrate the pricing model's behavior in various market conditions. The simulations investigate a variety of scenarios that involve the impact of price transition times and discount rates on profitability. This section underscores the model's practical applicability for businesses that are optimizing pricing strategies and illustrates its performance in real-world contexts.

The conclusion is presented in Section 5, which summarizes the primary findings and explores the more extensive implications of market segmentation and intertemporal pricing strategies for profitability. It also offers suggestions for future research, including the investigation of additional variables that may impact consumer behavior, such as external market forces or digital marketing tools, and further empirical validations of the model. The objective of this section is to offer a comprehensive strategy for the expansion of research into new contexts and for enhancements of the overall model.

1.1. Research Objectives

This study explores the impact of market segmentation and intertemporal pricing strategies on profitability by analyzing consumer purchasing behaviors across different segments. The primary goal is to illustrate how customized pricing strategies that appeal to both brand-loyal customers, who are generally less sensitive to price fluctuations, and deal-prone customers, who are more sensitive to price reductions, can result in enhanced sales [1,9]. Furthermore, this study examines the potential of market segmentation to stabilize revenue streams by providing standard prices to loyal customers and implementing targeted price reductions to attract more price-sensitive consumers [4,10].

This study aims to demonstrate the potential of scheduled pricing adjustments and the meticulous segmentation of consumer groups to improve overall profitability by improving the efficacy of these strategies [12,13]. Businesses must implement dynamic pricing strategies that correspond with consumer behavior in order to optimize profitability in competitive markets. Intertemporal pricing is one such strategy, which entails the adjustment of prices over time to accommodate various consumer segments, including deal-prone consumers and loyal consumers. The objective is to maximize the revenue potential throughout the product's lifecycle by capturing value from both groups [2,7].

This study addresses two critical questions that are essential for the effective implementation of intertemporal pricing strategies:

I. What is the optimal switching time point (t)? This inquiry seeks to ascertain the optimal moment to transition from charging a higher price (P^H) that targets loyal customers who prioritize early access and are willing to pay a premium to a lower price (P^L) in order to attract deal-prone customers, who are more sensitive to price changes. The timing of this transition is essential, as it dictates the duration of time that a company can leverage its loyal, less price-sensitive consumers before moving on to a more price-sensitive market segment. According to Reitsamer et al. [9], Suh [4], and Chen et al. [7], the optimal switching time (t) must be determined by a balance between extending the product's market presence through discounted sales to deal-prone customers and maximizing revenue from loyal customers during the high-price period.

   The importance of this question is derived from its influence on profit maximization. If the transition is made prematurely, the company is at risk of missing out on potential profits from loyal consumers who are prepared to pay a higher price. In contrast, if the transition is implemented too late, the organization may lose sales opportunities by alienating deal-prone customers who may move to competitors. Therefore, by determining the optimal t, firms can effectively leverage price discrimination over the time to maximize overall profitability [13].

II. What is the optimal discount (D)? The second question is concerned with the optimal size of the discount (D), which is defined as the difference between the high price (P^H) and the low price (P^L). This discount is instrumental in influencing the purchasing decisions of consumers who are inclined to pursue deals, as they are motivated by the perceived savings. The challenge for firms is to establish a discount that is sufficiently substantial to generate demand from customers who are inclined to take advantage of deals, while simultaneously preserving the product's perceived value and the profits earned during the high-price period [14,15].

The optimal discount (D) must be carefully calibrated. The efficacy of the discount period may be diminished, if the discount is not substantial enough to appeal to price-sensitive consumers. Nevertheless, an excessive discount could undermine the brand's reputation and discourage future purchases at full price, particularly if loyal customers believe they have been overcharged. The objective of this research is to determine the optimal discount level that will generate demand from consumers who are inclined to pursue deals, while simultaneously ensuring brand integrity and profitability [16].

These two research topics are interconnected, as the effectiveness of the pricing strategy is influenced by the level of the discount (D) and the timing of the price switch (t). According to Tyulin and Chursin [12] and Chen et al. [7], the product's exclusivity is perceived by loyal customers in relation to the timing of the price change, while the amount of the discount influences the degree to which deal-prone customers respond to the reduced price.

By simulating a variety of market conditions and consumer behaviors, the mathematical model developed in this study aims to optimize both (t) and (D). The model identifies the conditions under which companies can achieve the greatest profit by regulating the transition between high-price and low-price phases. This offers businesses practical insights, particularly in industries where product lifecycles are brief, and pricing strategies must be adaptable and responsive to consumer demands [17,18].

In conclusion, this research addresses a gap in the literature by analyzing the intertemporal segmentation of markets and providing a comprehensive analysis of how businesses can optimize profits by catering to various customer segments at different periods. It deepens our understanding of how intertemporal price discrimination can be employed to develop more profitable pricing strategies in markets that exhibit both price sensitivity and brand loyalty [19,20].

1.2. Literature Gaps

The existing literature on market entry and pricing adjustments provides valuable insights into the optimization of product and lifecycle pricing. When introducing new products, a strategic pricing model that is tailored to specific consumer segments is commonly employed. These strategies frequently entail the introduction of products at a higher price to attract loyal, less price-sensitive customers, followed by price reductions to draw deal-prone customers [21,22].

1.2.1. Complex Interaction Between Loyal and Deal-Prone Consumers

Previous research analyzed the isolated behaviors of loyal customers and deal-prone consumers. For example, Kumar and Reinartz [1] emphasize the importance of focusing on loyal consumers, while Webster [8] examines the behavior of consumers who are inclined to pursue deals. Nevertheless, the potential for businesses to integrate both segments into a unified pricing strategy has been overlooked.

The present research aims to fill this gap by investigating the ways in which companies can target loyal and deal-sensitive customers simultaneously, with dynamic pricing strategies that are customized for each group [1,8].

1.2.2. Timing and Extent of Price Adjustments

Even though previous studies have investigated the impact of price sensitivity on consumer behavior [23,24], there is a shortage of empirical analyses on how businesses can optimize the timing and extent of price reductions to satisfy both customer groups.

The present research introduces a comprehensive model that investigates the optimal timing and method for price reductions that will not only appeal to deal-prone purchasers but will also maintain the loyalty of loyal consumers [23,24].

1.2.3. Intertemporal Pricing in Various Industries

Although Nagle and Müller [2] and Caro and Martínez-de-Albéniz [6] address pricing strategies in sectors such as electronics and fashion, the literature frequently lacks a comprehensive, cross-sectoral analysis. This discussion is extended by the present research, which applies intertemporal pricing strategies to a variety of industries, demonstrating the broader applicability of these pricing models across sectors such as electronics, automobiles, and fashion.

1.3. Research Novelty

1.3.1. Unified Pricing Strategy and Novel Approach in Market Segmentation and Intertemporal Pricing

Although there have been extensive studies on loyalty vs. deal-prone customer behavior, the effects of price changes, and intertemporal pricing strategies, most studies have focused on these topics separately [25]. This study, however, indicates a departure from previous models. It aims to bridge this gap by formulating a unified pricing strategy that uses dynamic, intertemporal pricing to cater to both price-sensitive and loyal consumers. This departure is noteworthy, since static segmentation and basic intertemporal pricing strategies have been the prevailing approaches.

1.3.2. Market Segmentation Techniques

Traditional market segmentation techniques, including cluster analyses and demographic segmentation, have been employed for a long time to divide consumers into distinct categories based on factors such as brand loyalty, income, and purchasing behavior. These methodologies are extensively implemented in sectors including consumption products and services [2]. Nevertheless, these methods frequently fail to capture the dynamic nature of consumer behavior, particularly the interaction between consumer categories over time. Most models are static, failing to account for how consumer preferences fluctuate in response to market conditions or time-sensitive pricing strategies [4]. By providing a model that dynamically modifies pricing strategies over time, this research addresses the divide in the market by catering to the changing behaviors of loyal and deal-prone consumers.

1.3.3. Intertemporal Pricing Models and Limitations

Intertemporal pricing models, which are common in industries like electronics, fashion, and durable goods [6], typically start with high initial prices to draw in loyal customers before dropping prices to appeal to deal-prone consumers. Although these models are commonly employed, they often demonstrate restricted accuracy due to their inability to optimize the timing and magnitude of price reductions. Numerous existing models fail to account for demand elasticity or real-time consumer behavior, which are indispensable for optimizing profitability [7]. Additionally, current models frequently presume that price elasticity remains constant across customer categories and over time, thereby neglecting the evolution of price sensitivity as new products are introduced to the market. This research introduces a more sophisticated approach that effectively anticipates the optimal price reduction timing and discount size for each customer group, thereby addressing these limitations.

1.3.4. Accuracy and Limitations in Existing Approaches

The current model's inability to effectively simulate the complex interaction between loyal and deal-prone consumers is one of their primary challenges. The models proposed by Reitsamer et al. [9] and Chen et al. [7] are designed to optimize revenue from faithful customers. However, they frequently overlook the opportunity to engage deal-prone customers without alienating loyal ones. This leads to a suboptimal equilibrium between customer retention and profitability. The current study addresses these deficiencies by introducing a dynamic pricing model that modifies in response to real-time market conditions and consumer responses, providing a more sophisticated method of harmonizing these two customer segments.

1.3.5. Research Gaps and Novelty of This Study

While prior studies have analyzed the isolated behaviors of loyal and deal-prone consumers, this research fills a critical gap by creating a comprehensive mathematical model that effectively depicts the dynamic interplay between these consumer segments over time. The innovative framework proposed in this article considers the optimal timing and extent of price reductions and demand elasticity and offers businesses a precise instrument for profit maximization. The model improves its ability to accurately determine the most effective discount size and the optimal timing for pricing transitions to attract both customer groups through various market simulations.

This research also expands the scope of intertemporal pricing models by demonstrating their relevance in sectors such as automobiles and durable products and extending their applicability beyond industries such as fashion and electronics. The model promotes socially responsible pricing strategies in addition to its technical advancements. It underscores transparency, equity, and consumer trust, which are consistently neglected in profit-driven models due to the increasing prevalence of corporate social responsibility (CSR) [2].

1.3.6. Consumer Segmentation Mathematical Modeling

Extant research provides quantitative frameworks for optimizing pricing strategies across customer segments only to a limited extent. By creating a comprehensive mathematical model to simulate market responses, the present research provides businesses with a new instrument to more accurately anticipate the results of pricing changes and to effectively balance loyalty retention and discount-driven sales. This introduces a new dimension to the primarily theoretical discussions of price segmentation in previous research [23,24].

1.3.7. Significant Consequences for Market Inclusivity

In contrast to much of the existing literature, which focuses narrowly on profit maximization, this study emphasizes the social implications of pricing strategies, advocating for transparency and equitable pricing practices that promote consumer trust and inclusivity, in contrast to most of the existing literature, which concentrates exclusively on profit maximization [2]. This broader perspective sets it apart from models that are solely profit-driven and is consistent with more recent discussions on corporate social responsibility in pricing [25]. This approach positions the model as a mechanism for revenue optimization and a framework for ethical business practices that promote sustainable consumer relationships.

The structure of this paper is as follows: Section 2 examines the relevant literature on market segmentation and intertemporal pricing strategies. We stress how new this investigation's method is and point out problems with existing models. The mathematical model devised to simulate market responses under varying pricing conditions is presented in Section 3, emphasizing the interaction between loyal and deal-prone consumers. The model's implementation is the subject of Section 4, which also offers simulation results to confirm its applicability. Lastly, Section 5 summarizes the results, delineates the potential implications for profitability, and recommends potential areas for future research.

2. Literature Review

2.1. Strategies for Market Entry and Pricing Adjustments

A strategic pricing model that targets varying consumer segments is frequently employed to introduce new products into the market, typically at a high initial price point. This pricing strategy capitalizes on the novelty of the product and targets a consumer demographic that is frequently referred to as "loyal customers". These consumers are not only willing but are also enthusiastic about paying a premium to obtain the most recent technology or fashion shortly after its release. Reitsamer et al. [9] contend that loyal consumers prefer early access, which reduces their sensitivity to price fluctuations, and price sensitivity is further lowered by emotional attachments, according to Kumar and Reinartz [1].

In order to appeal to "deal-prone customers", who prioritize discounted older models, prices are reduced as newer models are introduced. Suh [4] underscores the need for timely price reductions to engage these consumers, while Shum et al. [10] highlight how price sensitivity drives market penetration. This was further developed by Iveson et al. [13], who emphasize that managing price changes throughout a product's lifecycle is crucial for maintaining relevance and extending market presence.

The product lifecycle theory can be applied to the transition from high initial prices to reduced prices as products mature in the market. Prices are altered to optimize the product's appeal throughout its lifecycle phase. This approach not only facilitates the elimination of obsolete inventory but also guarantees the product's market presence throughout its lifespan. Tyulin and Chursin [12] emphasize the necessity of aligning price reductions with market trends. The findings of Dai [26] underscore the importance of price fairness in ensuring customer satisfaction, while Nagle and Müller [2] examine the potential for revenue optimization through the adjustment of prices in accordance with demand cycles.

This pricing strategy is prominently observed in the cellular market, such as with smartphones. For example, a new smartphone model may be priced at a premium upon its release, with the intention of appealing to tech-savvy and brand-loyal consumers who prioritize the acquisition of the most recent technology.

This was illustrated by the Samsung Galaxy S8 Plus and Apple iPhone X, which were initially priced higher but were subsequently reduced to appeal to a broader consumer base. According to Phau and Cheong [25], this approach allows businesses to effectively segment their market, thereby guaranteeing consistent revenue throughout the product's lifecycle. Chen et al. [27] and Chen and Chen [28] highlight the importance of demand forecasting, whereas Tavor [11] and Mitra [29] focus on customer segmentation and precise pricing adjustments to optimize profitability.

The examination of the impact of brand loyalty and price sensitivity on consumer behavior is a natural consequence of the discourse surrounding market entry and pricing adjustments. In order to more effectively target specific consumer segments, it is imperative to understand these dynamics in order to refine pricing strategies.

2.2. Analyzing Market Dynamics in Brand Loyalty and Price Sensitivity: Strategic Pricing and Consumer Segmentation

In the consumer market, strategic marketing and pricing decisions are significantly influenced by the subtle distinction between deal-prone and loyal customers.

Phau and Cheong [25] contend that price sensitivity is considerably diminished by brand loyalty, as devoted consumers tend to exhibit a reduced responsiveness to price fluctuations in products of their preferred brands. Dowling and Uncles [30] substantiate this notion, asserting that loyal consumers' attachment to brands reduces their sensitivity to price fluctuations, thereby reducing their likelihood of switching to alternative products, even in the presence of price fluctuations.

It is essential to cultivate robust brand loyalty in order to not only maintain a loyal consumer base but also to improve the overall brand–consumer relationship. Fernandes and Moreira [31] and Gummerus et al. [32] underscore the long-term advantages of loyalty,

including enhanced consumer advocacy. Flynn [21] and Lau [22] discovered that increased brand loyalty results in decreased price sensitivity, which mitigates the risks associated with price fluctuations.

Businesses encounter numerous obstacles when developing strategies to manage this variation in consumer behavior between consumers who are inclined to make deals and those who are loyal. Determining the optimal initial price for loyal consumers, who are less sensitive to price fluctuations, is a significant obstacle. Identifying the most effective discounted price for deal-prone consumers at the appropriate point in time of the product's lifecycle is another challenge. The significance of timing price reductions to maintain equilibrium between both segments is the subject of Tyulin and Chursin's [12] discussion. Nagle and Müller [2] claim that extending premium pricing in fact enhances loyalty while attracting price-sensitive consumers at a later point in the product's lifecycle.

2.3. Understanding Customer Segmentation: Differentiating Between Deal-Prone and Loyal Consumers

It is imperative to understand the fundamental distinctions between loyal and deal-prone customers and how these distinctions can be effectively identified before we venture into the specific model regarding distinct customer categories. Donthu et al. [33] emphasize the substantial role that consumer sensitivity to price fluctuations plays in the effective segmentation of the market. Loyal consumers, who prioritize product quality and brand loyalty over immediate price reductions, are in stark contrast to deal-prone consumers, who are more responsive to discounts and promotions. This stark contrast in consumer behavior highlights the importance of dynamic pricing strategies tailored to these consumer segments' unique needs. Businesses can enhance market penetration and optimize profitability by adjusting prices over time. This involves offering higher prices to loyal consumers during the early phases of a product's lifecycle and implementing targeted reductions for deal-prone customers later. These observations underscore the significance of segmented pricing models in dealing with the distinctive purchasing habits of various customer segments. Joshy [34] and Jiang et al. [17] underscore the significance of early consumer categorization in order to optimize efforts. In a similar vein, Russo et al. [35] point out the importance of personalized strategies in the digital age, while Flacandji and Vlad [36] observe that understanding consumer psychology facilitates more effective promotions.

Once businesses understand the fundamental differences between deal-prone and loyal consumers, the next step is to identify which consumers fall into each category to allow for more targeted pricing strategies.

2.4. Identifying Customers Who Are Deal-Prone Versus Loyal

Loyal consumers are generally less susceptible to price fluctuations, as they prioritize the intrinsic qualities and quality of the product over its cost. According to Kumar and Advani [37] and Ramachandran and Balasubramanian [38], the influence of price fluctuations is mitigated by trust and satisfaction, which drive stable purchasing. Gázquez-Abad and Sánchez-Pérez [39] demonstrate that loyalty reduces price sensitivity, while Montaner et al. [40] show that loyal consumers evaluate products based on quality and trust.

In contrast, consumers who are inclined to take advantage of promotions and discounts exhibit a higher level of sensitivity to price fluctuations. For example, Neslin et al. [41] and Tsalis [42] demonstrate a robust correlation between brand-switching behavior and price sensitivity.

Identifying loyal and deal-prone customers also reveals the complex interplay between these characteristics and helps businesses craft more nuanced strategies that address both consumer types.

2.5. The Multifaceted Interplay Between Deal Proneness and Brand Loyalty

Yoon and Tran [43] demonstrate that loyal customers maintain brand loyalty, while deal-prone consumers respond to price adjustments. This dynamic has significant implications for the optimization of marketing strategies and our understanding of price sensitivity.

In contrast to previous assumptions that suggested a strictly negative relationship between deal proneness and brand loyalty, a more complex relationship is revealed by Sun et al. [44] and Dapena-Baron et al. [45], whereby consumers may exhibit both behaviors, subject to the context.

Market Share of Deal-Prone and Brand-Loyal Customers and Their Reactions to Technological Advancements.

Research indicates that the proportion of consumers who are deal-prone and those who are brand-loyal varies among different industries. For instance, in the fashion sector, approximately 30–40% of consumers are deal-prone, particularly during seasonal sales, while 60–70% are brand-loyal and are prepared to pay higher prices for early access to new collections [46].

The introduction of new products, such as smartphones or laptops in the technology sector, elicits distinct reactions from these two categories. Here, brand-loyal consumers, who typically constitute approximately 50–60% of early adopters, are prepared to pay a premium for the most recent versions. In the initial phases of the product's lifecycle, this group is less sensitive to price reductions and values early access, as observed by Reitsamer et al. [9] and Tyulin and Chursin [12].

Deal-prone customers, who are both receptive to technological advancements and are more susceptible to discounts—and, therefore, are willing to accept older models—may account for 40–50% of the market.

The significance of well-timed price reductions is emphasized in the research by Suh [4] and Shum et al. [10]. This is because these consumers are highly motivated by perceived values in relation to price decreases, particularly as new versions of products enter the market.

Segmentation is frequently stimulated by technological innovations. The Samsung Galaxy S8 and Apple iPhone X are examples of new models that have advanced features that are rapidly adopted by brand-loyal customers. Early purchases generate substantial initial revenue. On the other hand, deal-prone customers may delay purchasing the current, older models until newer versions are released, which presents businesses with the opportunity to reduce inventory [47].

Ultimately, this dual-segmentation strategy enables businesses to optimize profitability by focusing on distinct consumer behaviors by segregating brand-loyal customers from deal-prone customers over time and across price points.

How each consumer group responds is significantly influenced by the timing of technological advancements and product introductions. The optimization of market presence and profitability is achieved by effectively managing this segmentation.

2.6. An Analysis of Intertemporal Pricing Strategies in Consumer Markets: Clothing, Automobiles, and Electronics

Intertemporal pricing, a dynamic pricing strategy, is essential in a variety of consumption markets, such as automobiles, electronics, and fashion. This strategy involves setting high initial prices for early adopters and then reducing prices over time to appeal to more price-sensitive consumers.

2.7. Implications for Marketing Strategy: Consumer Price Sensitivity

The marketing strategy is significantly influenced by consumer pricing sensitivity, as it effects profitability and competitive positioning. Goldsmith et al. [48] link price sensitivity to brand parity, consumer involvement, and innovativeness. Lin et al. [49] further emphasize that consumers with greater brand parity are more susceptible to price fluctuations, requiring pricing strategies that consider these variables.

The insights gained from analyzing consumer price sensitivity directly inform strategic decisions regarding market segmentation to better capture the value of each customer segment.

2.7.1. Utilization in the Fashion Industry

Intertemporal pricing is notably evident in the fashion industry, particularly among brand-name companies.

The significance of timing price reductions to maintain equilibrium between both segments is the subject of Tyulin and Chursin's [12] discussion. Nagle and Müller [2] contend that extending premium pricing enhances loyalty while attracting price-sensitive consumers at a later stage in the product's lifecycle.

2.7.2. Intertemporal Pricing in Durable Goods

Durable products, including furniture, electronics, and automobiles, are sold using comparable pricing strategies. Initially, these products are offered at high suggested retail prices, but to attract a broader consumer base, prices are reduced over time, typically in response to the introduction of newer models or technological advancements. Market dynamics, consumer depreciation rates, and inventory levels necessitate a profound comprehension of the strategic timing of these price adjustments, denoted as t. Chen et al. [7] examine the impact of depreciation and consumer preferences on pricing strategies.

By examining how businesses balance early high pricing with later discounts, we can gain a more comprehensive understanding of its role in revenue optimization.

2.8. Effectiveness and Rationality of Intertemporal Pricing

The rationality and efficacy of intertemporal pricing are frequently the subject of debate. Critics contend that these strategies may be perceived as exploitative or opportunistic, which could potentially alienate consumers who are sensitive to perceptions of price fairness. The significance of perceived fairness in pricing strategies is underscored by Kahneman et al. [50]. Nevertheless, Chen et al. [7] and Kalyanaram and Winer [51] demonstrate that, when executed effectively, this approach optimizes revenue without alienating loyal customers.

Studies exploring the strategy of intertemporal pricing show similar conclusions. Besanko and Winston [20] observe that profitability is enhanced in sectors such as technology and fashion by acquiring early adopters and subsequently targeting deal seekers. Pandey et al. [19] underscore the importance of well-timed price reductions in order to optimize customer satisfaction and revenue. Huang et al. [52] and Jiang et al. [17] emphasize the importance of aligning pricing with market dynamics and consumer behavior. To this, Wu et al. [18] add their observation that pricing adjustments are essential for preserving competitiveness.

A comprehensive understanding of market behavior allows organizations to achieve optimum profitability by maintaining a balance between high and discounted pricing, which appeals to both loyal and deal-oriented consumers.

2.9. Strategic Implications for Market Segmentation

The market segmentation strategy must effectively handle the dynamic interplay between loyal and deal-prone consumers. Tavor et al. [11] show that loyal consumers will pay a premium for early access to products, resulting in high initial revenues, while Shannahan et al. [53] emphasize the significance of discounts to attract consumers who are inclined to pursue deals as the product matures.

This thorough analysis of modifications in pricing emphasizes the significance of identifying and capitalizing on the distinctions between consumers who are loyal to a brand and those who are more inclined to make deals. Ultimately, businesses can drive revenue growth, enhance consumer satisfaction, and optimize their market segmentation efforts by customizing marketing strategies to the unique characteristics of each group and understanding their responses to price changes.

Lastly, the strategic implications of market segmentation facilitate a more comprehensive examination of the strategies by which businesses can isolate customer groups based on both time and location. This approach guarantees businesses to effectively distinguish between various consumer behaviors in order to optimize profitability over time.

2.10. Assumptions Regarding the Optimal Switching Time (t) and Discount (D) in Intertemporal Pricing

The concept of determining the optimal switching time point (t), where businesses transition from higher to lower prices, and the optimal discount (D), the gap between the high price (P^H) and low price (P^L), is essential to intertemporal pricing strategies, especially when segmenting consumer groups into categories.

The importance of strategically timing price reductions to balance revenue from early adopters with deal-prone consumers is underscored by Tavor et al. [11]. The switching point (t) is essential in this balancing act, as it enables businesses to capture the consumer surplus from both groups by extending the period during which loyal consumers pay a premium before offering discounts.

This is consistent with the thesis of Shekhar et al. [54], who contend that the precise timing of these discounts guarantees a smooth transition between consumer segments, thereby maximizing profitability.

Furthermore, the optimal discount (D) has a substantial impact on the demand of consumers who are inclined to pursue deals. Mishra et al. [16] have shown that price-sensitive consumers demonstrate a substantial increase in demand as a result of increased discounts. This is consistent with the findings of Palazon and Delgado-Ballester [14], who discovered that deal-prone consumers are highly responsive to significant price reductions, and the demand increases as the gap between P^H and P^L widens.

Li [55] further investigates the correlation between t and D, proposing that the higher the eventual discount must be in order to attract deal-prone consumers, the longer the high-price phase lasts. Nevertheless, Dapena-Baron et al. [45] warn that excessively high discounts can erode brand loyalty. They recommend that businesses carefully balance both variables to avoid alienating loyal consumers while still appealing to deal seekers.

Chen et al. [7] underscore the significance of predicting the optimal switching time (t) by analyzing market conditions and consumer behavior. Their model posits that in order to optimize profitability and preserve competitiveness, businesses must dynamically alter t in response to real-time feedback from market demands.

2.11. Simultaneous Differentiation Between Customer Groups and Periods

In our model, optimal t is the very critical turning point when the marketer may shift from high prices, P^H, to low prices, P^L, thus departing from a market of sales to loyal customers to a market of sales to deal-prone customers. This is the problem of creating not only a differentiation between markets of different and well-defined customer groups but also a differentiation between the periods when each group uses the product. Often sellers may isolate markets, as when a simple monopoly becomes a discriminator by generating market differentiation among different customer groups according to age or location. Examples of such market separations are flight tickets for children as compared with adults or domestic sales as compared with foreign sales. In such examples, the products are simultaneously sold at different prices to different groups. However, isolation between markets may also generate intertemporal separation in which items are sold at a certain high price for a specified time and "only" to a certain customer group. This has not been considered previously, despite the fact that it may significantly influence the profits of a firm. The isolation between periods may be desirable in the case of the externality's phenomenon in consumption by different types of customers, such as in our case of loyal and deal-prone customers. It should be used to leverage profits. The ability of a firm to manage a "dual segmentation system" in which products are sold to different markets at different prices, during different consecutive periods, may generate significant extra profit

due to dividing the period ($\overline{T}$) into two isolated subperiods. If indeed, as we believe may happen, a high price for a specific time period, t, is followed by a discounted sales price for the rest of the product life ($\overline{T} - t$), then the value of t is the crucial point of time when price switching occurs. We apply the model discussed below to several numerical simulations and illustrate the significant profit gaps that may occur in the regular case where $t = 0$, that is, when sales are made at different prices to different customers or markets during the entire period of ($\overline{T}$). We compare such a case to the case where optimal t is positive (when $0 < t < \overline{T}$). The high price only exists for time t, followed by a period of $\overline{T} - t$, in which the sales are only made at a discount price. The profit comparison and the investigation to find the optimal t will be derived and will illustrate the importance of intertemporal price discrimination.

Based on the discussion above, the model developed in this paper answers two basic questions: What is the optimal switching time point of t? And what is the optimal discount, D, which is equal to the gap between P^H and P^L? This paper does not address the practice of offering discounts.

A discount can be generated either by supplying a coupon of value, D, to deal-prone customers at point t [56,57] or by announcing, in advance, that until a certain time period t, the product is sold at full price P^H and later determining a sale or clearance price of P^L. The decision regarding t and the discount (D) is determined and well-defined in advance to both the loyal and deal-prone customer groups upon the entry of the new product. As mentioned above, today's market of certain popular brand-name products, such as smartphones or clothing, has very unique characteristics, since it usually includes two different and well-defined customer groups. One group of customers, referred to as loyal customers, includes those who are ready and willing to pay high prices for the new product immediately "upon its entrance into the market". (Consider the lines of people who waited for dozens of hours for the sale of the new Samsung Galaxy S8 smartphone and the Apple iPhone X.) For those customers, the firm should determine an optimal price of P^H. Simultaneously, the period of time (t) in which the high price (P^H) is maintained by the sellers brings loyal customers more satisfaction and increases their demand for the prestigious product. During that time, they are also the only customers for the product. The longer the duration of t, the greater the satisfaction of the loyal customers.

However, a company should not neglect the other group of customers referred to as deal-prone customers. Such customers are ready to postpone the purchasing the product until a certain time, t, when it will be sold at a discounted price of P^L. Furthermore, their demand is affected negatively by P^L but positively by the price discount, D. Higher discounts encourage the customers to buy more. However, the demand is also affected negatively by the duration of time of t. The longer the duration of t, the shorter the duration of the $\overline{T} - t$ that remains for the deal-prone customers. This means that there is a shorter time for the deal-prone customers to use the product. Thus, the variable t negatively affects the demands of deal-prone customers.

Blattberg et al. [58] employed a consumer behavior model to identify deal-prone households, and they discovered that factors such as property and automobile ownership affect deal proneness. Transaction, holding, and stockout costs were the primary focus of their model. Nevertheless, the present research concentrates on price discounts as the primary factor that drives deal proneness, rather than these other factors.

Palazon and Delgado-Ballester [14] suggest that deal-prone customers respond differently to price discounts depending on the benefit level. While lower benefit levels may make discounts less appealing, at higher benefit levels, deal proneness increases the preference for discounts. This paper, in contrast, asserts that price discounts are a major factor influencing deal-prone behavior regardless of benefit levels.

Discount strategies have been replaced with everyday low-price (EDLP) methods by certain companies, which are more appealing to different consumer segments. Garretson and Burton [15] investigated the distinctions between consumers who are highly deal-prone and those who are less deal-prone. They discovered that deal-prone individuals are not

only drawn to lower prices but also derive pleasure from the purchasing experience during sales. Nevertheless, the most significant factor influencing deal-prone consumer behavior in the present research is a reduced price.

Summary of Key Points

This literature review emphasizes that businesses can utilize dynamic pricing strategies to accommodate both loyal and deal-prone consumers. Customers who are loyal are less price-sensitive and are prepared to pay a premium in the beginning, while those who are deal-prone will wait for discounts, which will increase their sales in the future. The optimization of profitability is contingent upon the effective segmentation and timing of pricing adjustments. It is imperative for businesses to customize their strategies to accommodate both customer segments, as new product versions and technological advancements significantly influence consumer behavior.

3. Theoretical Model

This section delineates the mathematical model formulated to enhance pricing tactics for two distinct consumer segments: loyal consumers and price-sensitive customers. The model seeks to determine the optimal pricing for each segment and the suitable timing for transitioning from a high price (P^H) to low price (P^L), hence enhancing the total profitability during a product's lifecycle.

3.1. Symbols and Parameters

To ensure clarity, we present the symbols and parameters utilized in the model, along with their definitions, in Table 1:

Table 1. Definitions of symbols and parameters used in the pricing model.

Symbol	Definition
P^H	High price charged during the initial phase to loyal customers
P^L	Low price charged to deal-prone customers after the transition
t	Time period during which the product is sold at a high price (P^H)
T	Total duration of the product's lifecycle
Q^H	Quantity demanded by loyal customers
Q^L	Quantity demanded by deal-prone customers
δ	Price elasticity of loyal customers (less price-sensitive)
ε	Price elasticity of deal-prone customers (more price-sensitive)
H	Maximum demand from loyal customers
L	Maximum demand from deal-prone customers
γ	Sensitivity of deal-prone customers to the price difference $(P^H - P^L)$
α	Positive impact of time on demand of loyal customers
β	Negative impact of time on demand of deal-prone customers
C	Unit production cost
C_{HO}	Holding costs incurred for later sales during period t

3.2. Assumptions

This model is predicated on specific assumptions that delineate the behavior of the two consumer groups and marketplace conditions.

1. Consumer Segmentation:
    - Loyal customers exhibit low price elasticity (δ), which means they are less sensitive to price changes, indicating a preference for early access and quality

rather than cost considerations. On the other hand, deal-prone customers exhibit significant price sensitivity (high price elasticity, ε), which means they are more inclined to postpone purchases until discounts are available.

2. Time Effects on Demands:
   - Understanding the impact of time on consumer behavior is crucial. Over time, the demand from loyal customers rises due to their preference for exclusive, early access, indicating a positive impact (α). The waiting time adversely affects the demand of deal-prone customers (negative impact β), as they perceive a diminished remaining product life.
3. Linear demand curves:
   - The assumption of linear demand curves in this model provides a valuable simplification that enables a simpler and more transparent analysis of price–demand relationships. The analytical clarity of the model is enhanced by assuming a constant rate of change in demand relative to price, which facilitates the extraction of critical insights and conclusions. This linearity establishes a strong foundation for understanding consumer behavior in response to price adjustments, particularly during the initial phases of analysis. The linear approach is a reliable starting point, despite the fact that real-world demands can manifest more complex scenarios. Establishing distinct relationships between pricing strategies and consumer segments is beneficial for businesses, as it enables them to make well-informed pricing decisions. In reality, consumer demands often respond non-linearly to price changes, with varying sensitivities at different price points, depending on factors such as brand loyalty, market conditions, and psychological influences. Although the linear approach provides an accessible baseline, it may overlook these nuanced aspects of consumer behavior. Nevertheless, the simplicity and flexibility of this assumption allow for the model to be expanded or adjusted as needed for more detailed future analyses.
4. Market Conditions:
   - The market is characterized by high competition, with pricing decisions predominantly shaped by consumer behavior.
5. Switching Point (t):

The timing of the price transition, referred to as the 'Switching Point (t)', is essential for optimizing profitability. The model aims to identify the optimal time to maximize revenue from loyal customers prior to transitioning to a lower price to engage deal-oriented customers.

6. Fixed Costs:

The production cost per unit (C) and holding costs (C_{HO}) for unsold products remain constant over the period, regardless of the volume of sales. These fixed costs directly affect the profitability of postponed sales to price-sensitive customers.

3.3. Mathematical Framework

The model developed below is divided into two cases. In the first case (Case 1), $t = 0$ i.e., the product is sold simultaneously to both customer groups during the entire period of $\overline{T}$. The extended case (Case 2) assumes $t > 0$, wherein customers, both loyal as well as deal-prone customers, consume the product during period t, while the deal-prone customers also consume it during the period from t to $\overline{T}$.

In order to establish a compelling justification for the examination of the two cases in this study, we must recognize the distinct consumer behaviors and their influence on pricing strategies. The analysis of Case 1 ($t = 0$) and Case 2 ($t > 0$) provides a comprehensive framework for understanding how temporal segmentation can optimize profitability by aligning pricing strategies with the behavior of loyal and deal-prone customers.

Case 1: $t = 0$

In this scenario, both loyal and deal-prone customers are exposed to the same pricing structure for the entire period, meaning the product is sold simultaneously to both groups. This approach, however, results in suboptimal profits, because deal-prone customers tend to be more sensitive to price changes. By not adjusting prices based on the unique buying patterns of each customer segment, businesses miss the opportunity to fully capture the value offered by loyal customers who are willing to pay a premium for early access to new products.

Case 2: $t > 0$

In contrast, Case 2 implements temporal segmentation, which involves offering the product at a higher price to loyal consumers for a designated period (t). The price is reduced to appeal to deal-prone customers after this period. This approach enables businesses to optimize revenue by leveraging the willingness of loyal customers to pay more in the early stages of the product's lifecycle while simultaneously capturing additional sales from price-sensitive, deal-oriented customers at a later stage. Businesses can expand their market reach and profitability by identifying the optimal point at which the price transition occurs, which is why the time t is a critical factor.

Rationale for Discussion

The examination of these two cases serves a dual purpose: Firstly, it underscores the significance of understanding consumer segmentation, particularly the distinctions between loyal and deal-prone customers, as they can have a substantial impact on revenue outcomes. Secondly, it demonstrates how businesses can fully capitalize on both consumer segments by structuring their pricing to correspond with customer preferences and behavior by implementing a temporal pricing strategy (Case 2).

By comparing Case 1 and Case 2, we emphasize the strategic importance of identifying the optimal transition point (t) between pricing phases. This demonstrates that the potential for increased profitability can be achieved by separating customer groups over time and adjusting prices accordingly.

Case 1

In this case, $t = 0$, and the product is sold to segmented loyal and deal-prone customers during the entire period of $\overline{T}$ at different market prices throughout the duration of the sale of the product until $\overline{T}$ ends.

In this case, the assumed linear demand curves are

$$D_1^H: \ Q_1^H = H - \delta P_1^H \tag{1}$$

and

$$D_1^L: \ Q_1^L = L \ - \varepsilon P_1^L + \gamma\left(P_1^H - P_1^L\right) \tag{2}$$

D_1^H represents the demand of loyal customers, while D_1^L represents the demand of deal-prone customers.

The demands in quantity terms are Q_1^H for loyal customers and Q_1^L for deal-prone customers. H is the maximum quantity demanded for loyal customers, and L is the maximum quantity demanded for deal-prone customers.

P_1^H represents high prices, and P_1^L represents low prices.

ε represents the price elasticity for deal-prone customers, and δ represents the price elasticity for loyal customers. γ measures the (negative) sensitivity of the quantity and the price difference for deal-prone customers.

According to Equation (2), deal-prone customers exhibit greater price sensitivity than loyal customers. This is reflected by the fact that the coefficient ε is greater than the coefficient δ. Consequently, the demand of deal-prone customers is more responsive to price changes as compared to the demand among loyal customers, underscoring their tendency to react more significantly to changes in price. Another factor is the discount given to deal-prone customers, which is measured by the price gap between the price that

the loyal customers are charged and the price that the deal-prone customers are charged. As mentioned above, the current paper does not consider the question of how this discount is given. The discount might be given either in coupons provided only to deal-prone customers [8,59,60] or by price-off labels.

No distinction is made between a specific and a general deal in the category of deal proneness. Deal type includes coupon proneness, rebate proneness, and flyer proneness [61–63], as opposed to being conceptualized as a general deal [64].

Moreover, for simplicity of presentation, the model includes only the price orientation of deal-prone customers, such as a price reduction by means of a coupon during a sale with a price reduction. Cases of deal proneness due to a free gift with a purchase, advertising displays, feature advertising, etc., are not included, since they do not directly offer a lower purchase price. Therefore, the model does not consider these and other factors.

The cost function of the supplier is assumed to be linear with respect to the total quantity produced for both customer groups:

$$TC_1 = C\left(Q_1^H + Q_1^L\right) \tag{3}$$

Based on Equations (1)–(3), we can define the objective function of profit maximization in Case 1, as follows

$$\underset{P_1^H, P_1^L, t}{Max}\ \pi_1 = \left(H - \delta P_1^H\right)P_1^H + \left[L - \varepsilon P_1^L + \gamma\left(P_1^H - P_1^L\right)\right]P_1^L - \left[C\left(H - \delta P_1^H + L - \varepsilon P_1^L + \gamma\left(P_1^H - P_1^L\right)\right)\right] \tag{4}$$

where prices P_1^H and P_1^L are the only two decision variables determined by the firm that maximizes profits:

The First Order Conditions (FOCs) with respect to the two decision variables are presented in (5) and (6) as follows:

$$\frac{\partial \pi_1}{\partial P_1^H} = H - 2\delta P_1^H + \gamma P_1^L + \delta C - \gamma C = 0 \tag{5}$$

From (5), we can derive the relationship between P_1^H and P_1^L as follows:

$$P_1^H = \frac{H + \gamma P_1^L + (\delta - \gamma)C}{2\delta} \tag{5a}$$

and

$$\frac{\partial \pi_1}{\partial P_1^L} = L + \gamma P_1^H - 2(\varepsilon + \gamma)P_1^L + (\varepsilon + \gamma)C = 0 \tag{6}$$

The second relationship between P_1^H and P_1^L that maintains (6) is presented in (6a)

$$P_1^H = \frac{2(\varepsilon + \gamma)P_1^L - L - (\varepsilon + \gamma)C}{\gamma} \tag{6a}$$

By Equating (5) and (6), we find (7)

$$\frac{H + \gamma P_1^L + (\delta - \gamma)C}{2\delta} = \frac{2(\varepsilon + \gamma)P_1^L - L - (\varepsilon + \gamma)C}{\gamma} \tag{7}$$

This leads to the equilibrium prices of P_1^H and P_1^L, presented in (8) and (9) in terms of the various parameters

$$P_1^L = \frac{\gamma H + 2\delta L + [\gamma(\delta - \gamma) + 2\delta[\varepsilon + \gamma]]C}{4\delta(\varepsilon + \gamma) - \gamma^2} \tag{8}$$

We mark the expression as follows:

$$\frac{\gamma H + 2\delta L + [\gamma(\delta - \gamma) + 2\delta(\varepsilon + \gamma)]C}{4\delta(\varepsilon + \gamma) - \gamma^2} \equiv N$$

Note that the notation "N" on line 498 is a mathematical symbol that is used for convenience. More specifically, it pertains to the price of P^L.

Additionally,

$$P_1^H = \frac{H + (\delta - \gamma)C}{2 \cdot \delta} + \frac{\gamma}{2\delta} N \tag{9}$$

The price difference is as follows:

$$P_1^H - P_1^L = \frac{H + (\delta - \gamma)C}{2\delta} + \frac{\gamma}{2\delta} N \tag{10}$$

Based on the above, the price difference is affected positively by parameters H and C and negatively by δ.

At this stage, we turn to Case 2, in which $t > 0$, i.e., P_1^H is determined only for time, t, and P_1^L is determined only for the remaining time $(\overline{T} - t)$.

Case 2

In this case, $t > 0$, i.e., the demands of the loyal customer group are also affected by $t > 0$, where during t, only loyal customers use the product, and later, during $(\overline{T} - t)$, the product is used by only deal-prone customers.

A simple and very basic model is developed below by presenting two kinds of demands, those of loyal customers, D_1^H, and those of deal-prone customers, D_1^L, which are both linearly affected by several decision variables. The demands, in quantity terms, are Q_2^H for loyal customers and Q_2^L for deal-prone customers, which are affected first by deal-prone customer prices and also by $t > 0$, which is the turning point in time when a price switches from P_2^H to P_2^L, and the discount is the price gap. We define P_2^H as the high price of the product from the entry of the new product into the market until point t. P_2^L is the new discount price charged from time point t until the end of the period $\overline{T}$.

The new separate demand functions, D_2^H, of loyal customers and of deal-prone customers (D_2^L) are different than in the aforementioned Case 1, where t = 0 (Case 1 in Equations (1) and (2) are specific cases of Equations (11) and (12) for $t = 0$).

$$D_2^H: \ Q_2^H = H + \alpha t \ - \delta P_2^H$$

$$D_2^L: \ Q_2^L = L + \beta(\overline{T} - t) - \varepsilon P_2^L + \gamma\left(P_2^H - P_2^L\right) \tag{11}$$

where the parameter of t positively affects the demands of loyal customers according to the value of coefficient α and negatively affects the demands of deal-prone customers according to the value of coefficient β.

Several different reasons can be given for the positive effect of t on loyal customers determined by α.

(a) An elitist meaning of loyal indicates that only those customers use the special product, in contrast to deal-prone customers, who might be considered inferior customers who cannot afford or do not deserve the expensive product.
(b) Loyal customers use a prestigious product that is for their exclusive benefit and that is unavailable to others.
(c) Luxury goods increase the utility of the wealthy, because the poor cannot afford them.

The cost function of the supplier also changes for (5), above, since postponing the use of some products until a later period requires additional holding costs:

$$TC_2 = C\left(Q_2^H + Q_2^L\right) + C_{HO} t \tag{12}$$

where C is the production cost per unit of production, and $C_{HO} \cdot t$ represents the total "holding costs" for late sales and increases by t. These may include inventory holding costs, advertising costs during period t, "differentiation" costs to avoid the entry of deal-prone customers, and "reminding" these customers that at time t, the product will be delivered and sold at a discounted price. The production costs, C, may also include the cost of issuing coupons in the case where P_2^L is reached by sending discount coupons to deal-prone customers. All the parameters in the linear Equations (1)–(3) above, α, δ, β, ε, H, L, C and C_{HO}, are positive and are the same in Case 2.

Based on the demands and costs in Case 2, we redefine the objective function of profit maximization in Case 2 as follows:

$$\underset{P_2^H, P_2^L, t}{Max}\ \pi_2 = \left(H + \alpha t - \delta P_2^H\right) P_2^H + \left[L + \beta\overline{T} - \beta t - \varepsilon P_2^L + \gamma\left(P_2^H - P_2^L\right)\right] P_2^L - [C(H + \alpha t\ - \delta P_2^H + L + \beta\overline{T} - \beta t - \varepsilon P_2^L + \gamma\left(P_2^H - P_2^L\right)) + C_{HO} t] \tag{13}$$

where, in this case, P_2^H, P_2^L, and t are the three decision variables that are solved by the marketer.

The First Order Conditions (FOCs) with respect to the three decision variables are as follows:

$$\frac{\partial \pi_2}{\partial P_2^H} = H + \alpha t - 2\delta P_2^H + \gamma P_2^L + \delta C - \gamma C = 0 \tag{14}$$

and

$$\frac{\partial \pi_2}{\partial P_2^L} = L + \beta\overline{T} - \beta t + \gamma P_2^H - 2(\varepsilon + \gamma) P_2^L + (\varepsilon + \gamma) C = 0 \tag{15}$$

and

$$\frac{\partial \pi_2}{\partial t} = \alpha P_2^H - \beta P_2^L - \alpha C + \beta C - C_{HO} = 0 \tag{16}$$

By equating Equations (15) and (16), we obtain the following:

$$t = \frac{2\delta P_2^H - H - \gamma P_2^L - \delta C + \gamma C}{\alpha} = \frac{L + \beta\overline{T} + \gamma P_2^H - 2(\varepsilon + \gamma) P_2^L + (\varepsilon + \gamma) C}{\beta} \tag{17}$$

And by simplifying Equation (18), we obtain

$$2\delta\beta P_2^H - H\beta - \gamma\beta P_2^L - \delta\beta C + \gamma\beta C = \left(L + \beta \cdot \overline{T}\right)\alpha + \gamma\alpha P_2^H - 2\alpha(\varepsilon + \gamma) P_2^L + (\varepsilon + \gamma) C\alpha \tag{18}$$

Or,

$$(2\delta\beta - \alpha\gamma) P_2^H - [2\alpha(\varepsilon + \gamma) - \gamma\beta] P_2^L - H\beta - \left(L + \beta\overline{T}\right)\alpha - [\alpha(\varepsilon + \gamma) + \beta(\delta - \gamma)] C = 0 \tag{19}$$

The reaction function between the prices P_2^H and P_2^L is derived from (17) as follows:

$$P_2^H = \frac{\beta P_2^L + (\alpha - \beta) C + C_{HO}}{\alpha} \tag{20}$$

From (20) and (21), we obtain the following:

$$(2\delta\beta - \alpha\gamma)\tfrac{\beta}{\alpha} P_2^L + (2\delta\beta - \alpha\gamma)\tfrac{[(\alpha - \beta) C + C_{HO}]}{\alpha} + [2\alpha(\varepsilon + \gamma) - \beta\gamma] P_2^L - H\beta - \left(L + \beta\overline{T}\right)\alpha - [\alpha(\varepsilon + \gamma) + \beta(\delta - \gamma)] C = 0 \tag{21}$$

And from here, we obtain the price for deal-prone customers during the period $\left(\overline{T} - t\right)$ at equilibrium as the optimal P_2^L.

$$P_2^L = \frac{\alpha\beta H + \alpha^2\left(L + \beta\overline{T}\right) + \left[\alpha^2(\varepsilon + \gamma) + \alpha\beta(\delta - \gamma) - (2\delta\beta - \alpha\gamma)\right] C - (2\alpha\beta - \alpha\gamma) C_{HO}}{2\delta\beta^2 + 2\alpha^2(\varepsilon + \gamma) - 2\alpha\beta\gamma} \tag{22}$$

We mark the expression as follows:

$$\frac{\alpha\beta H + \alpha^2\left(L + \beta\overline{T}\right) + \left[\alpha^2(\varepsilon+\gamma) + \alpha\beta(\delta-\gamma) - (2\delta\beta - \alpha\gamma)\right]C - (2\alpha\beta - \alpha\gamma)C_{HO}}{2\delta\beta^2 + 2\alpha^2(\varepsilon+\gamma) - 2\alpha\beta\gamma} \equiv M$$

And the price for loyal customers until t is

$$P_2^H = \frac{(\alpha-\beta)C + C_{HO}}{\alpha} + \frac{\beta}{\alpha}M \tag{23}$$

The price difference is as follows:

$$P_2^H - P_2^L = \frac{(\alpha-\beta)C + C_{HO}}{\alpha} + \left(\frac{\beta-\alpha}{\alpha}\right)M \tag{24}$$

The value at equilibrium of the variable t, that is the switching point of prices from P_2^H to P_2^L, is defined in Equations (26) and (27).

$$t = \frac{2\delta[(\alpha-\beta)C + C_{HO}]}{\alpha^2} - \frac{H + (\delta-\gamma)C}{\alpha} + \left(\frac{2\delta\beta}{\alpha^2} - \frac{\gamma}{\propto}\right)M \tag{25}$$

Or,

$$t = \frac{\gamma[(\alpha-\beta)C + C_{HO}]}{\alpha\beta} + \frac{L + \beta\overline{T} + (\varepsilon+\gamma)C}{\beta} + \left[\frac{\gamma}{\propto} - \frac{2(\varepsilon+\gamma)}{\beta}\right]M \tag{26}$$

We conclude that Equations (22)–(24) define the price for deal-prone customers, P_2^L ; the price for loyal customers, P_2^H ; and the switching point (t) at equilibrium.

In the next section, we compare Cases 1 and 2 for specific values of the several parameters.

A comparison between cases is analytically impossible. Therefore, a comparison between Cases 1 and 2 is introduced in the following tables that are derived from simulations calculated by running different values of the parameters. (For detailed information regarding Generalization, Assumptions in Numerical Analysis, and Timing Analysis, see the Supplementary Materials).

Table 2 presents the values of certain parameters for Case 1, where $t = 0$.

Table 2. Prices, quantities, and profits without segmentation.

L	**α**	**β**	**γ**	**δ**	**ε**	**C**	**C^t**
150	0.7	0.6	0.5	0.9	1	0	60
for t = 0							
H	**P$^L{}_1$**	**P$^H{}_1$**	**t$_1$**	**Q$^L{}_1$**	**Q$^H{}_1$**	**TC$_1$**	***Π*$_1$**
200	43.84	123.29	0.00	145.89	89.04	0.00	17,372.87
195	39.04	119.18	0.00	151.03	87.74	0.00	16,352.93
190	34.25	115.07	0.00	156.16	86.44	0.00	15,294.43
185	29.45	110.96	0.00	161.30	85.14	0.00	14,197.36
180	24.66	106.85	0.00	166.44	83.84	0.00	13,061.74
175	19.86	102.74	0.00	171.58	82.53	0.00	11,887.55
170	15.07	98.63	0.00	176.71	81.23	0.00	10,674.80
165	10.27	94.52	0.00	181.85	79.93	0.00	9423.48
160	5.48	90.41	0.00	186.99	78.63	0.00	8133.61
155	0.68	86.30	0.00	192.12	77.33	0.00	6805.17

Subject to the parameters given in the first row below, the profit results are shown in Table 2. In Table 2, the profit ***Π*$_1$** is determined.

Table 2 presents the scenario where the firm does not implement segmentation, meaning there is no time delay (t = 0) between selling to loyal customers and deal-prone customers. In this non-segmented scenario, the profit is calculated based on the assumption

that both consumer groups purchase the product concurrently. The findings indicate inadequate profits due to the firm's inability to capitalize on the unique attributes of each consumer segment. Due to deal-prone customers' increased price sensitivity, which may reduce their purchase quantities in response to the relatively high price, the overall profit is likely diminished. However, the most significant missed opportunity lies with loyal customers, whose willingness to pay a premium is not fully utilized during the initial phases, highlighting the urgency to address this issue.

For the same parameter values mentioned above, we again determine the value of H and look for the optimal values of t (excluding $t = 0$) that lead to profit maximization. The effects of different values on the t values and profit Π and on the optimal values of t are shown in Table 3.

Table 3. Prices, quantities, and profits with segmentation for $t > 0$.

H	$P^L{}_2$	$P^H{}_2$	t2	$Q^L{}_2$	$Q^H{}_2$	TC_2	π_2
200	66.96	143.11	34.45	100.44	95.32	2067.14	18,299.47
195	65.72	142.05	39.75	98.59	94.98	2385.16	17,586.57
190	64.49	140.99	45.05	96.73	94.65	2703.18	16,878.98
185	63.25	139.93	50.35	94.88	94.31	3021.20	16,176.68
180	62.01	138.87	55.65	93.02	93.98	3339.22	15,479.68
175	60.78	137.81	60.95	91.17	93.64	3657.24	14,787.99
170	59.54	136.75	66.25	89.31	93.30	3975.27	14,101.59
165	58.30	135.69	71.55	87.46	92.97	4293.29	13,420.49
160	57.07	134.63	76.86	85.60	92.63	4611.31	12,744.70
155	55.83	133.57	82.16	83.75	92.30	4929.33	12,074.20

In Table 3, the firm uses a segmentation strategy, where $t > 0$, meaning there is a time delay before switching from high prices ($P^H{}_2$) for loyal customers to lower prices ($P^L{}_2$) for deal-prone customers. Market segmentation enables the firm to optimize profits by leveraging the readiness of loyal customers to pay premium prices in the initial phase. In this scenario, profits (π_2) exceed those in Table 2, as segmentation enables the firm to optimize revenue from loyal and deal-prone customers. The findings indicate that an optimal $t2$ (e.g., 34.45 for $H = 200$) results in the maximum profit (18,299.47) through strategic postponement of the price reduction.

For the same parameter values, the following tables determine, for a given H of 200, the optimal t that leads to profit maximization.

Table 4 examines the optimization of prices and switching times in response to high demands from loyal customers (H). The firm can maintain a high price (P^H) for an extended period due to the integral role of loyal customers in this strategy, before transitioning to a lower price (P^L). This approach optimizes profits, as loyal customers are valued and are willing to pay a premium for early access.

Table 4. Optimal profit with high H.

H	P^L	P^H	t	Q^L	Q^H	TC	π
200	50.55	129.04	10.00	132.70	90.86	600.00	17,832.71
200	53.90	131.92	15.00	126.10	91.77	900.00	18,004.08
200	57.26	134.79	20.00	119.51	92.68	1200.00	18,136.42
200	60.62	137.67	25.00	112.91	93.60	1500.00	18,229.72
200	63.97	140.55	30.00	106.32	94.51	1800.00	18,284.00
200	66.96	143.11	34.45	100.44	95.32	2067.00	18,299.47
200	70.68	146.30	40.00	93.12	96.33	2400.00	18,275.44
200	74.04	149.18	45.00	86.53	97.24	2700.00	18,212.62
200	77.40	152.05	50.00	79.93	98.15	3000.00	18,110.76
200	80.75	154.93	55.00	73.34	99.06	3300.00	17,969.87

For the same parameter values but lower H values, in Tables 5 and 6, we find smaller values of profit. However, the switching time period from P^H to the discounted price (P^L) is shorter, as expected.

Table 5. Optimal profit with intermediate H.

H	P^L	P^H	t	Q^L	Q^H	TC	π
185	36.16	116.71	10.00	148.11	86.96	600.00	14,905.47
185	42.88	122.47	20.00	134.92	88.78	1200.00	15,457.44
185	49.59	128.22	30.00	121.73	90.60	1800.00	15,853.29
185	56.30	133.97	40.00	108.53	92.42	2400.00	16,093.00
185	63.25	139.93	50.35	94.88	94.31	3021.00	16,176.68
185	69.73	145.48	60.00	82.15	96.07	3600.00	16,104.03
185	76.44	151.23	70.00	68.96	97.89	4200.00	15,875.35
185	83.15	156.99	80.00	55.77	99.71	4800.00	15,490.54
185	89.86	162.74	90.00	42.58	101.53	5400.00	14,949.60
185	96.58	168.49	100.00	29.38	103.36	6000.00	14,252.53

Table 6. Optimal profit with low H.

H	P^L	P^H	t	Q^L	Q^H	TC	π
155	27.53	109.32	40.00	139.36	84.62	2400.00	10,686.92
155	34.25	115.07	50.00	126.16	86.44	3000.00	11,267.03
155	40.96	120.82	60.00	112.97	88.26	3600.00	11,691.01
155	47.67	126.58	70.00	99.78	90.08	4200.00	11,958.86
155	55.83	133.57	82.16	83.74	92.30	4929.60	12,074.20
155	61.10	138.08	90.00	73.40	93.73	5400.00	12,026.17
155	67.81	143.84	100.00	60.21	95.55	6000.00	11,825.62
155	74.52	149.59	110.00	47.01	97.37	6600.00	11,468.95
155	81.23	155.34	120.00	33.82	99.19	7200.00	10,956.15
155	87.95	161.10	130.00	20.63	101.01	7800.00	10,287.21

Table 5 presents a scenario in which the demand for loyal customers (H) is moderate. The variables remain consistent with those in prior tables, adjusted for this intermediate-demand level. In the context of intermediate demands, the firm ought to lower the elevated price more promptly than in a high-demand situation. The diminished demand from loyal customers suggests that sustaining elevated prices for an extended period may negatively impact the overall profitability.

Table 6 illustrates the situation in which the demand from loyal customers (H) is minimal. This scenario of low demand necessitates a more aggressive pricing strategy.

The firm must reduce prices early to capture sales from deal-prone customers due to low demands from loyal customers. The switching time (t) is markedly reduced, and the total profits are diminished compared to high- or intermediate-demand scenarios.

Conclusion: The findings presented in Tables 2–6 illustrate the significant impact of segmentation and the timing of price reductions on the optimization of profitability. Through precise adjustments to the timing (t) of price transitions and the price differential between loyal and deal-prone customers, the firm can enhance its revenue streams. This segmentation strategy proves effective in situations where the demand from loyal customers is moderate to high, enabling the firm to maximize the value from early adopters prior to targeting the more price-sensitive market segment.

Figure 1 illustrates the impact of different levels of loyal customer demands (H) on the optimal timing of price transitions (t) from high prices (P^H) to low prices (P^L) and the resulting profitability. The transition point (t) from high to low pricing is delayed as H increases, for a given value of L, enabling businesses to optimize revenue from loyal customers before offering discounts to deal-prone consumers. As illustrated in this figure, market segmentation strategies are highly effective in increasing overall profitability

by leveraging early sales at premium prices and subsequently targeting price-sensitive customers with discounts.

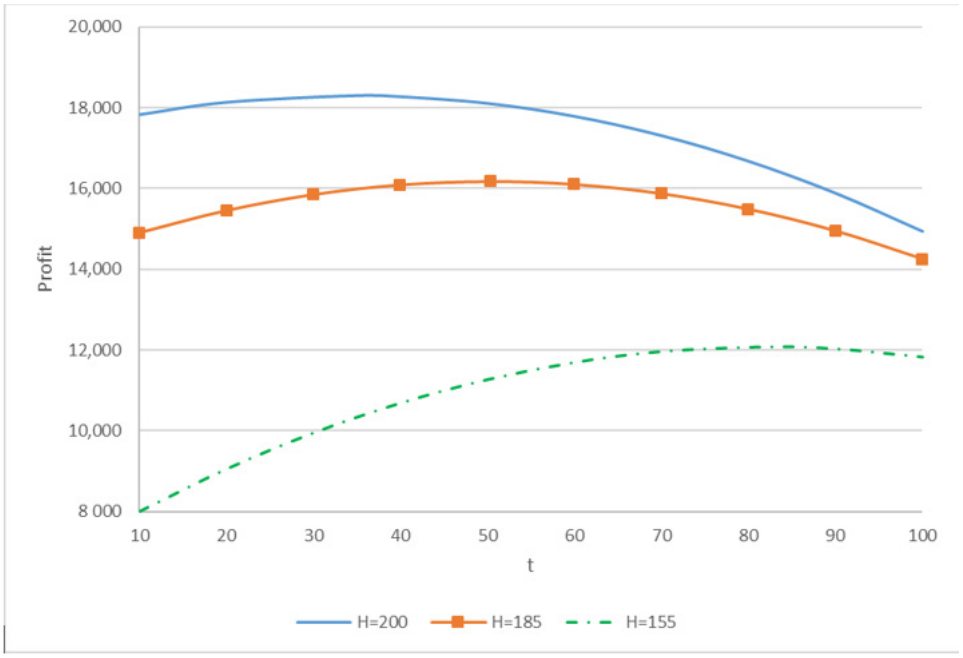


Figure 1. The effect of consumer segmentation on pricing strategies and profitability.

Further conclusions regarding the comparison between Cases 1 and 2 are presented in the following section.

4. Results and Implications

4.1. Results

The analysis confirmed that market segmentation effectively increases sales by targeting both loyal and deal-prone consumers in unique ways.

We can now further investigate the specific consumer categories that generate this growth, as we have established that market segmentation results in an overall increase in sales. In order to maximize pricing strategies, it is essential to understand the preferences of loyal consumers, who exhibit reduced price sensitivity, contributing to stable revenue streams.

The behavior of price-sensitive, deal-prone consumers must also be taken into account. Businesses can achieve a balance between early adopters and bargain seekers by understanding the purchasing propensity of these consumers, who respond actively to price reductions and discounts.

Businesses can optimize revenue and customer satisfaction throughout the lifecycle of a product by scheduling timely pricing adjustments to correspond with consumer behavior.

Moreover, this study reveals that implementing scheduled pricing adjustments that account for the distinct preferences of these two consumer groups enhances overall profitability. By strategically timing price reductions and segmenting consumers accordingly, businesses can optimize revenue-promotion strategies. This demonstrates the value of creating pricing models that accommodate both loyal and price-sensitive consumers, effectively targeting both segments.

These findings on the effectiveness of scheduled pricing adjustments offer insights into how different consumer segments react to pricing strategies and the broader impact on sales and profitability.

4.2. Overall Implications

4.2.1. Strategic Insights

The strategic advantage of segmenting consumers into loyal and deal-prone groups and employing timed pricing adjustments is robustly supported by the present study. Segmentation and pricing strategies optimize profitability and effectively target both consumer segments. Based on these findings, it is now possible to investigate the strategic insights that have been derived from this research in order to provide businesses with the necessary information to optimize their pricing strategies and market segmentation.

The mathematical model utilized in this investigation serves to bolster the strategic insights discussed.

4.2.2. Model Validation

A mathematical model is a highly effective instrument for predicting and optimizing the outcomes of pricing strategies in real-world scenarios.

It is imperative to validate our pricing model in order to guarantee its theoretical robustness and practical relevance. The objective of this chapter is to demonstrate that the model is not only theoretically sound but also reflects observable real-world phenomena. Model validation is a multifaceted process that involves a comparison of the model with empirical data, a verification of its theoretical assumptions, and an evaluation of its behavior through simulation-based sensitivity analyses.

Theoretical Validation: The internal consistency of the model has been rigorously evaluated through numerous mathematical derivations. In order to illustrate the relationships between critical variables, including the optimal transition time (t) and the price gap ($P^H - P^L$) across different market scenarios, we implemented numerical simulations. This offers solid theoretical grounding for the model, which has been carefully designed to maximize profits by segmenting consumers effectively into loyal and deal-prone categories.

Empirical Validation: We have strengthened the model validation by introducing empirical referencing from prior studies that align with the assumptions and findings of our research. These empirical references are drawn from studies that investigate real-world pricing behaviors, consumer segmentation, and dynamic pricing strategies. Examples of prior studies that support our model's assumptions and findings are presented in the Supplementary Materials.

Simulations and Sensitivity Analysis: Additionally, we implemented numerical simulations and sensitivity analyses to verify the model's resilience in a variety of parameter configurations. This guarantees that the predictions are reliable, and this also allows for the model to be adjusted in future studies to reflect specific market conditions. Empirical examples (see the Supplementary Materials) are incorporated to verify the anticipated behaviors of segmented consumer groups.

4.2.3. Ethical and Policy Considerations

The test results are a motivating factor for the development of pricing strategies that are both reasonable and equitable, thereby reducing market discrimination. This is especially important in preventing price-sensitive consumers from being unfairly penalized, as this could have far-reaching social implications in terms of market accessibility and fairness.

Several critical insights that businesses must consider when implementing market segmentation and dynamic pricing are derived from the ethical and policy dimensions of pricing strategies to guarantee that they are also fair and inclusive. These insights provide a framework for achieving a balance between ethical business practices and profitability.

4.3. The Results Emphasize Numerous Critical Insights

This study confirms that market segmentation effectively increases sales by targeting loyal and deal-prone consumers differentially. Loyal customers, who exhibit lower price sensitivity, contribute to stable revenue streams by purchasing at higher prices, whereas deal-prone customers are drawn to discounts, which increase sales volumes during price reductions.

The insights gathered from this study point to a clear path for profitability optimization.

4.3.1. Profitability Optimization

The optimization of profitability is achieved through the implementation of custom pricing strategies that are specifically designed for various consumer segments. The mathematical model that was developed in this study predicts that strategic price reductions, which are customized to the purchasing patterns of price-sensitive customers, will significantly increase profitability without alienating the loyal customer base.

The timing of price adjustments is linked to profitability optimization. Businesses can guarantee sustained sales throughout the product's lifecycle by strategically adjusting prices to appeal to both price-sensitive and loyal consumers.

4.3.2. Strategic Price Adjustments

Strategic price adjustments are demonstrated in this research to be effective in optimizing revenue. By understanding the optimal timing for price reductions, businesses can more effectively manage their sales strategies to accommodate both loyal and deal-prone consumers.

4.3.3. Theoretical Consequences

This investigation refines our theoretical comprehension of market segmentation and dynamic pricing. It provides a comprehensive framework for businesses to strategize their pricing models in accordance with consumer segmentation by combining consumer behavior theories with practical pricing strategies.

This strategy has the capacity to increase profitability and market penetration. Practical implications for businesses are directly translated from the theoretical consequences that were previously discussed. The findings of this study can be implemented by businesses to enhance their marketing strategies and optimize revenue generation across various consumer segments.

4.3.4. Practical Business Implications

This research offers businesses the chance to create more effective pricing strategies that are indicative of the complex behaviors of a variety of consumer segments. The optimization of profits and the enhancement of customer contentment can be achieved by businesses by more closely aligning pricing strategies with consumer expectations and price sensitivity.

Strategic Price Adjustments

The model can be utilized by businesses to determine the optimal time to reduce prices, thereby ensuring that they capture the optimum revenue from loyal customers who are prepared to pay a premium before offering discounts to deal-prone customers. For instance, a smartphone manufacturer may initially maintain high prices to appeal to early adopters and subsequently decrease them to attract price-sensitive consumers.

Optimizing Revenue Throughout the Product's Lifecycle

This research demonstrates that companies can extend the revenue-generating lifecycle of a product by strategically timing the transition from high to low prices. This is especially beneficial for sectors such as technology and fashion, which introduce new versions and product updates frequently. For example, fashion brands can generate consistent revenue from various consumer segments by selling new collections at a premium and subsequently discounting older inventory to clear stock.

Improving Inventory Management

Businesses can mitigate the risk of overstocking or underselling by effectively managing inventory levels and attracting deal-prone consumers. This is achieved by determining

when to lower pricing. This is particularly pertinent for businesses that deal with perishable goods, seasonal products, or fast-moving consumer goods (FMCGs), as prompt pricing adjustments can prevent losses.

Utilization in Diverse Markets

The findings of this study are applicable to a variety of sectors, such as automobiles, electronics, and retail. For example, automobile manufacturers may implement the model to preserve the premium prices of new car models by providing discounts as newer versions are introduced. This enables them to efficiently dispose of older models without sacrificing profitability.

4.3.5. Social Consequences

Although the practical business implications of market segmentation are evident, it is equally crucial to evaluate the social repercussions of these strategies. This research also considers the more extensive social implications of market segmentation, such as consumer welfare and market fairness. It emphasizes the potential hazards of pricing strategies that could result in market discrimination or the exclusion of specific consumer groups. The findings emphasize the importance of transparency and impartiality in pricing strategies, promoting the adoption of fair pricing practices to foster consumer trust and loyalty.

The broader discussion of how market segmentation can be both profitable and equitable is driven by the social implications of pricing strategies. The objective of this discourse is to investigate how to balance consumer welfare and revenue generation.

5. Conclusions and Recommendations

This study introduced a detailed mathematical model for intertemporal pricing strategies designed to maximize profitability by categorizing consumers into loyal and deal-seeking segments. The model underwent theoretical and empirical validation, confirming its practical application across several industries, including technology and fashion, where dynamic pricing is essential. The findings indicate that enterprises may improve profitability by meticulously overseeing the shift from elevated pricing (for loyal clientele) to reduced prices (for deal-prone consumers).

The numerical simulations demonstrated that the ideal transition time (t) and pricing disparity ($P^H - P^L$) impact profitability in various market scenarios. These findings establish a robust theoretical basis for the suggested pricing technique, guaranteeing its applicability in practical contexts. The results indicate that segmentation tactics can enhance profitability, particularly in sectors characterized by brief product lifecycles or intense competition.

The model is adaptable and generalizable, being suitable for applications in many market conditions. Despite the data included in this study being theoretical assumptions derived from existing consumer behavior models, the findings align with empirical research. Enterprises may utilize this model to refine their pricing strategies by integrating empirical data, hence enhancing the model's precision and relevance.

The results of this study contribute substantially to the existing literature on dynamic pricing and market segmentation by elucidating the intricate interplay between consumer purchase behaviors and market segmentation strategies. This study improves the theoretical frameworks concerning the efficacy of segmentation and consumer price sensitivity in dynamic markets by emphasizing the unique behaviors of loyal and deal-prone consumers.

It is important to compare the results of this study with previous research in the field, as we continue this discussion. The results will be contextualized, and any new contributions to the literature on market segmentation and pricing strategies will then be highlighted through this comparison.

5.1. In Comparison to Prior Research

Our findings are consistent with and expand upon prior research by illustrating the potential of segmentation to increase sales by effectively targeting distinct consumer groups.

Our study affirms that loyal consumers exhibit lower price sensitivity, thereby stabilizing revenue streams even at higher price points, in accordance with the findings of Phau and Cheong [25] and Gázquez-Abad and Sánchez-Pérez [39]. In stark contrast, consumers who are inclined to take advantage of deals, as outlined in the works of Webster [8] and Bawa and Shoemaker [23], are more susceptible to price reductions, which lends credence to the hypothesis that strategic price reductions can substantially increase sales volumes.

A comparison with previous research establishes the foundation for the introduction of an innovative model that is designed to enhance market strategies. This model provides a more complex comprehension of the ways in which businesses can optimize profitability by utilizing consumer segmentation and pricing dynamics.

5.1.1. A Model for Improving Market Strategies—Understanding Consumer Segmentation and Pricing Dynamics

It is essential to be able to accurately identify and distinguish between various groups of consumers, particularly those who are loyal and deal-prone, when examining the intricacies of consumer behavior. A difficulty frequently arises from the "de facto" identification that is derived from the purchasing dispositions of consumers. Customers who are loyal frequently exhibit leadership in the consumption of new products at premium prices, while those who are more inclined to take advantage of deals participate later, frequently at reduced prices during clearance sales. This distinction is essential for developing targeted pricing strategies.

Businesses must initially identify the diverse segments of their consumer base in order to effectively implement this model.

5.1.2. Consumer Segmentation Identification

Market segmentation is predicated on the identification and differentiation of consumer categories. It can frequently be easily ascertained through demographic factors, including age, gender, or geographic location. Nevertheless, the challenge of distinguishing between specific consumer behaviors, such as those of loyal versus deal-prone customers, is more intricate. Typically, loyal consumers are early adopters who purchase new products at high prices, which is indicative of their lower price sensitivity and greater emphasis on product attributes. Conversely, consumers who are interested in bargains are distinguished by their elevated level of price sensitivity, frequently postponing their purchases until prices have declined substantially.

Identifying consumer segments is not without its obstacles. The following section will investigate the methods and obstacles associated with segmentation, offering businesses practical guidance on how to overcome these obstacles.

5.1.3. The Methods and Obstacles of Segmentation

In addition to the high cost of market research, the process of segmenting consumers requires time [65–67]. Intertemporal discrimination is a term that refers to the differentiation of customer categories based on a variety of factors, such as the time of purchase, location, and pricing policies [68].

Once businesses have navigated the obstacles of segmentation, they can apply the intertemporal market segmentation model. This model helps businesses optimize their pricing strategies over time to meet the needs of both loyal and deal-prone customers.

5.1.4. Intertemporal Market Segmentation Model

This model demonstrates the strategic significance of temporal isolation and price discrimination in the consumption patterns of various consumer groups. One example is that new smartphones or fashion apparel may be initially priced at a premium in order to attract loyal consumers.

These products may be offered at clearance prices in the future to attract consumers who are prone to taking advantage of deals, thereby effectively segmenting the market based on price points and purchase timing.

The intertemporal market segmentation model is applicable to a wide range of industries. In the next section, we will investigate the practical applications of this model and the potential extensions that could further improve its efficacy.

5.2. Practical Applications and Model Extensions

The model's applicability is not limited to consumer commodities; it also encompasses services and public amenities, such as shared local services (e.g., public transportation or swimming facilities), which can be segmented by user group or time.

This method guarantees optimal utilization and reduces conflicts among various consumer groups. Furthermore, the model can be implemented in high-tech sectors that sell innovations or patents to exclusive purchasers, followed by broader markets at varying pricing tiers.

The model can be further expanded to encompass scenarios in which the total available time is reorganized into three components. Optimal time sharing occurs after the optimal time of exclusive use by one consumer group, during which both parties either use the same good simultaneously with distinct consumption units or even mutually use the same "public good". The third component is the optimal exclusive period for the second consumer group to utilize the service.

In order to demonstrate the practical applications of the model, we compare two case studies. These case studies demonstrate the potential for varying outcomes in terms of profitability and consumer satisfaction when various strategies for market segmentation and pricing are implemented.

Case Studies: Comparison of Case 1 and Case 2

The model distinguishes between two instances of market behavior. In Case 1, a general pricing strategy is implemented across all consumer categories in the absence of market segmentation, which may result in a decrease in overall profits. On the other hand, Case 2 implements strategic segmentation, charging higher prices to loyal customers and lower prices to deal-prone customers at distinct intervals.

This method not only optimizes the quantity sold to each customer type but also maximizes profits, thereby enhancing the market's overall efficacy.

The broader body of knowledge on market segmentation and pricing strategies is enhanced by the insights obtained from these case studies. The contributions of this research will be summarized in this final section, which will also propose potential areas for future research in the field.

5.3. Contribution to Knowledge and Future Research

This study's contribution to the fields of economics and marketing is significantly enhanced by the clear corroboration for all hypotheses. This is particularly evident in understanding how precise market segmentation and intertemporal pricing strategies can be employed to optimize both consumer satisfaction and business profitability.

This research could be improved by incorporating empirical data to validate the predicted behaviors of segmented consumer groups in future studies. A more comprehensive comprehension of the applicability of intertemporal pricing and segmentation strategies in various market contexts could also be achieved by broadening the scope to encompass a diverse array of industries. Additionally, investigating the influence of digital marketing tools on the efficacy of dynamic pricing strategies could offer valuable insights into the ways in which technology affects consumer behavior and market segmentation.

This study has shown some intriguing avenues for further research that may enhance the model and broaden its applicability:

1. Integration of Empirical Data: Although this study is based on theoretical assumptions, subsequent research should integrate more empirical data to enhance and substantiate the model within certain businesses. Collecting data on actual customer behavior, price sensitivity, and sales patterns across several industries may enhance the model's calibration, hence increasing its prediction accuracy and applicability to real-world business scenarios.
2. Industry-Specific Applications: The model is applicable across several industries, each possessing distinct features. For example, sectors like technology and fashion have rapid product cycles, whereas durable-goods businesses tend to have extended cycles. Future research may examine the model's applicability across many industries, analyzing how optimum pricing methods vary according to product lifecycle duration, market saturation, and consumer behavior dynamics.
3. Incorporation of Competitor Behavior: Actual markets are intensely competitive, and pricing strategies are frequently shaped by the behaviors of rivals. Subsequent research may enhance the model by including the behavior of competetive prices, enabling organizations to simulate and predict competitor responses to pricing alterations. This would enhance the model's realism and assist enterprises in effectively navigating competitive landscapes.
4. Advanced Analytics and Machine Learning: The emergence of advanced data analytics allows for the use of machine learning models in future iterations of the model to enhance price sensitivity assessments and improve the timing of price adjustments. These techniques can uncover concealed patterns in customer behavior, enabling corporations to adapt pricing tactics dynamically in real time. Machine learning may improve forecasts regarding when loyal consumers are inclined to transition to competitors or when discount-sensitive customers are most amenable to promotions.
5. Broader Consumer Segmentation: Future studies may investigate enhancing the model to incorporate a wider array of consumer categories. In addition to loyal and deal-oriented customers, the market frequently includes casual buyers or consumers whose purchase decisions are influenced by non-price variables, like product attributes or brand reputation. Incorporating supplementary consumer profiles might enable the model to provide more sophisticated pricing methods that respond to wider market factors.
6. Multinational Market Considerations: An intriguing avenue for future studies involves expanding the model to encompass multinational marketplaces, where consumer behavior and price sensitivity may significantly change across various areas. The model might be modified to consider regional variations in customer demands, competition, and economic situations, providing corporations with a method to enhance pricing strategies globally.

5.4. Study Limitations

This study's primary limitation is its dependence on theoretical models without direct empirical validation from market data. Although this investigation predominantly employs theoretical models to forecast consumer behavior and pricing strategies, it provides extensive insights that are based on well-established economic and marketing principles. The models employed offer a structured framework that precisely encapsulates anticipated market behaviors in specific and prevalent scenarios. The model's assumptions are substantiated by an ample amount of literature and real-world trends in a variety of industries, including technology and fashion, despite the fact that direct empirical validation from market data has not been the primary focus of this study. In addition, the adaptability of these models enables them to be fine-tuned and customized as empirical data become available, thereby providing a robust foundation for future validation endeavors.

The results are still valid within the parameters of the established theoretical frameworks and offer a reliable foundation for comprehending the dynamics of price demands across various consumer segments.

While there may be deviations in real-world scenarios due to external factors, these are opportunities for further exploration and refinement rather than threats to the model's integrity. The model's predictive power remains strong, and future empirical studies will only enhance its applicability and accuracy.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/math12213364/s1. References [69–75] are cited in the supplementary materials.

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References

1. Kumar, V.; Reinartz, W. Creating enduring customer value. *J. Mark.* **2016**, *80*, 36–68. [CrossRef]
2. Nagle, T.T.; Müller, G. *The Strategy and Tactics of Pricing: A Guide to Growing More Profitably*; Routledge: Abingdon, Oxfordshire, UK, 2017.
3. Gangwar, M.; Kumar, N.; Rao, R.C. Pricing under dynamic competition when loyal consumers stockpile. *Mark. Sci.* **2021**, *40*, 569–588. [CrossRef]
4. Suh, W.S. Formation and Influence of Price Perceptions on Behavioural Intentions: The Case of Dynamic Pricing Strategy. 2014. Available online: http://purl.flvc.org/fsu/fd/FSU_migr_etd-9102 (accessed on 4 August 2024).
5. Rather, R.A.; Hollebeek, L.D.; Vo-Thanh, T.; Ramkissoon, H.; Leppiman, A.; Smith, D. Shaping customer brand loyalty during the pandemic: The role of brand credibility, value congruence, experience, identification, and engagement. *J. Consum. Behav.* **2022**, *21*, 1175–1189. [CrossRef] [PubMed]
6. Caro, F.; Martínez-de-Albéniz, V. Fast fashion: Business model overview and research opportunities. *Retail Supply Chain Manag.* **2015**, 237–264.
7. Chen, K.; Zha, Y.; Alwan, L.C.; Zhang, L. Dynamic pricing in the presence of reference price effect and consumer strategic behaviour. *Int. J. Prod. Res.* **2020**, *58*, 546–561. [CrossRef]
8. Webster, F. The deal-prone consumer. *J. Mark. Res.* **1965**, *2*, 186–189.
9. Reitsamer, B.F.; Stokburger-Sauer, N.E.; Kuhnle, J.S. How and when effective customer journeys drive brand loyalty: The role of consumer-brand identification. *J. Serv. Manag.* **2024**, *35*, 109–135. [CrossRef]
10. Shum, S.; Tong, S.; Xiao, T. On the impact of uncertain cost reduction when selling to strategic customers. *Manag. Sci.* **2017**, *63*, 843–860. [CrossRef]
11. Tavor, T.; Gonen, L.D.; Spiegel, U. Customer Segmentation as a Revenue Generator for Profit Purposes. *Mathematics* **2023**, *11*, 4425. [CrossRef]
12. Tyulin, A.; Chursin, A. The Fundamentals of Product Life Cycle Economics. *New Econ. Prod. Life Cycle* **2020**, 1–50.
13. Iveson, A.; Hultman, M.; Davvetas, V. The product life cycle revisited: An integrative review and research agenda. *Eur. J. Mark.* **2022**, *56*, 467–499. [CrossRef]
14. Palazon, M.; Delgado-Ballester, A. The expected benefit as determinant of deal-prone consumers' response to sales promotions. *J. Retail. Consum. Serv.* **2011**, *18*, 542–547. [CrossRef]
15. Garretson, J.A.; Burton, S. Highly coupon and sale prone consumers: Benefits beyond price savings. *J. Advert. Res.* **2003**, *43*, 162–172. [CrossRef]
16. Mishra, U.; Tijerina-Aguilera, J.; Tiwari, S.; Cárdenas-Barrón, L.E. Retailer's joint ordering, pricing, and preservation technology investment policies for a deteriorating item under permissible delay in payments. *Math. Probl. Eng.* **2018**, *2018*, 6962417. [CrossRef]
17. Jiang, S.; Feng, D.; Lu, C. A sustainable innovation—Additional services for products based on personalized customer value. *Sustainability* **2019**, *11*, 1763. [CrossRef]
18. Wu, M.; Ran, Y.; Zhu, S.X. Optimal pricing strategy: How to sell to strategic consumers? *Int. J. Prod. Econ.* **2022**, *244*, 108367. [CrossRef]
19. Pandey, N.; Tripathi, A.; Jain, D.; Roy, S. Does price tolerance depend upon the type of product in e-retailing? Role of customer satisfaction, trust, loyalty, and perceived value. *J. Strateg. Mark.* **2020**, *28*, 522–541. [CrossRef]

20. Besanko, D.; Winston, W.L. Optimal price skimming by a monopolist facing rational consumers. *Manag. Sci.* **1990**, *36*, 555–567. [CrossRef]
21. Flynn, L.R.; Goldsmith, R.E.; Kim, W.M. A cross-cultural validation of three new marketing scales for fashion research: Involvement, opinion seeking, and knowledge. *J. Fash. Mark. Manag.* **2000**, *4*, 110–120.
22. Lau, M.M.; Chang, M.T.; Moon, K.L.; Liu, W.S. The brand loyalty of sportswear in Hong Kong. *J. Text. Appar. Technol. Manag.* **2006**, *5*.
23. Bawa, K.; Shoemaker, R. The coupon-prone consumer: Some findings based on purchase behavior across product classes. *J. Mark.* **1987**, *51*, 99–110. [CrossRef]
24. Tellis, G.J. Beyond the many faces of price: An integration of pricing strategies. *J. Mark.* **1986**, *50*, 146–160. [CrossRef]
25. Phau, I.; Cheong, E. How young adult consumers evaluate diffusion brands: Effects of brand loyalty and status consumption. *J. Int. Consum. Mark.* **2009**, *21*, 109–123. [CrossRef]
26. Dai, B. The Impact of Perceived Price Fairness of Dynamic Pricing on Customer Satisfaction and Behavioural Intentions: The Moderating Role of Customer Loyalty. Ph.D. Thesis, Auburn University, Auburn, AL, USA, 2010.
27. Chen, X.; Feldman, J.; Jung, S.H.; Kouvelis, P. Approximation schemes for the joint inventory selection and online resource allocation problem. *Prod. Oper. Manag.* **2022**, *31*, 3143–3159. [CrossRef]
28. Chen, S.; Chen, S. The product life cycle and product design. *Des. Imp.* **2019**, 123–142.
29. Mitra, A.; Jain, A.; Kishore, A.; Kumar, P. A comparative study of demand forecasting models for a multi-channel retail company: A novel hybrid machine learning approach. In *Operations Research Forum*; Springer International Publishing: Cham, Switzerland, 2022; Volume 3, p. 58.
30. Dowling, G.R.; Uncles, M. Do customer loyalty programs really work? *Sloan Manag. Rev.* **1997**, *38*, 71–82.
31. Fernandes, T.; Moreira, M. Consumer brand engagement, satisfaction and brand loyalty: A comparative study between functional and emotional brand relationships. *J. Prod. Brand Manag.* **2019**, *28*, 274–286. [CrossRef]
32. Gummerus, J.; Liljander, V.; Weman, E.; Pihlström, M. Customer engagement in a Facebook brand community. *Manag. Res. Rev.* **2012**, *35*, 857–877. [CrossRef]
33. Donthu, N.; Kumar, S.; Mukherjee, D.; Pandey, N.; Lim, W.M. How to conduct a bibliometric analysis: An overview and guidelines. *J. Bus. Res.* **2021**, *133*, 285–296. [CrossRef]
34. Joshy, J.; Bharadhwaj, S.; Shawn, M. Does loyalty matter? Impact of brand loyalty and sales promotion on brand equity. *J. Promot. Manag.* **2020**, *26*, 524–543.
35. Russo Spena, T.; D'Auria, A.; Bifulco, F. Customer insights and consumer profiling. *Digit. Transform. Cult. Herit. Sect.* **2021**, 95–117.
36. Flacandji, M.; Vlad, M. The relationship between retailer app use, perceived shopping value and loyalty: The moderating role of deal proneness. *Int. J. Retail Distrib. Manag.* **2022**, *50*, 981–995. [CrossRef]
37. Kumar, S.; Advani, J. Factors affecting brand loyalty: A study in an emerging market on fast-moving consumer goods. *J. Consum. Behav.* **2005**, *4*, 251–275.
38. Ramachandran, S.; Balasubramanian, S. Examining the moderating role of brand loyalty among consumers of technology products. *Sustainability* **2020**, *12*, 9967. [CrossRef]
39. Gázquez-Abad, J.C.; Sánchez-Pérez, M. Characterizing the deal-proneness of consumers by analysis of price sensitivity and brand loyalty: An analysis in the retail environment. *Int. Rev. Retail Distrib. Consum. Res.* **2009**, *19*, 1–28.
40. Montaner, T.; De Chernatony, L.; Buil, I. Consumer response to gift promotions. *J. Prod. Brand Manag.* **2011**, *20*, 101–110. [CrossRef]
41. Neslin, S.A.; Henderson, C.; Quelch, J. Consumer promotions and the acceleration of product purchases. *Mark. Sci.* **1985**, *4*, 147–165. [CrossRef]
42. Tsalis, G. What's the deal? Consumer price involvement and the intention to purchase suboptimal foods: A cross-national study. *Food Qual. Prefer.* **2020**, *79*, 103747. [CrossRef]
43. Yoon, K.; Tran, T. Revisiting the relationship between consumer loyalty and price sensitivity: The moderating role of deal-proneness. *J. Mark. Theory Pract.* **2011**, *19*, 293–306. [CrossRef]
44. Sun, X.; Pelet, J.É.; Dai, S.; Ma, Y. The Effects of Trust, Perceived Risk, Innovativeness, and Deal Proneness on Consumers' Purchasing Behavior in the Livestreaming Social Commerce Context. *Sustainability* **2023**, *15*, 16320. [CrossRef]
45. Dapena-Baron, M.; Gruen, T.W.; Guo, L. Heart, head, and hand: A tripartite conceptualization, operationalization, and examination of brand loyalty. *J. Brand Manag.* **2020**, *27*, 355–375. [CrossRef]
46. Helmold, M. Pricing Strategies and Discount Policy. In *Performance Excellence in Marketing, Sales and Pricing: Leveraging Change, Lean and Innovation Management*; Springer International Publishing: Cham, Switzerland, 2022; pp. 133–146.
47. Namin, A.; Soysal, G.P.; Ratchford, B.T. Alleviating demand uncertainty for seasonal goods: An analysis of attribute-based markdown policy for fashion retailers. *J. Bus. Res.* **2022**, *145*, 671–681. [CrossRef]
48. Goldsmith, R.E.; Flynn, L.R.; Kim, D. Status consumption and price sensitivity. *J. Mark. Theory Pract.* **2010**, *18*, 323–338. [CrossRef]
49. Lin, T.T.; Yeh, Y.Q.; Hsu, S.Y. Analysis of the Effects of Perceived Value, Price Sensitivity, Word-of-Mouth, and Customer Satisfaction on Repurchase Intentions of Safety Shoes under the Consideration of Sustainability. *Sustainability* **2022**, *14*, 16546. [CrossRef]
50. Kahneman, D.; Knetsch, J.L.; Thaler, R.H. Fairness and the assumptions of economics. *J. Bus.* **1986**, S285–S300. [CrossRef]
51. Kalyanaram, G.; Winer, R.S. Empirical generalizations from reference price research. *Mark. Sci.* **1995**, *14*, G161–G169. [CrossRef]

52. Huang, L.; Huang, Z.; Liu, B. Interacting with strategic waiting for store brand: Online selling format selection. *J. Retail. Consum. Serv.* **2022**, *67*, 102987. [CrossRef]
53. Shannahan, R.J.; Shannahan, K.L.J.; Bush, A.J.; Moncrief, W.C. Taking the good with the bad: Customer type as a segmentation criterion and differential influencer of sales performance. *J. Mark. Theory Pract.* **2016**, *24*, 283–305. [CrossRef]
54. Shekhar, C.; Yadav, V.; Saurav, A. Optimal analysis of time-price discount-advertisement dependent demand with credit policy for inventory models. *Ann. Oper. Res.* **2024**, 1–48. [CrossRef]
55. Li, W. Pricing Strategies in a Dynamic Market. In *Strategic Management Accounting in a Network Economy*; Springer Nature Singapore: Singapore, 2023; pp. 183–209.
56. Ben-Zion, U.; Hibshoosh, A.; Spiegel, U. Price discrimination by coupons restriction. *Int. J. Econ. Bus.* **2000**, *7*, 325–331. [CrossRef]
57. Ben-Zion, U.; Hibshoosh, A.; Spiegel, U. The optimal face of discount coupon. *J. Econ. Bus.* **1999**, *51*, 159–174. [CrossRef]
58. Blattberg, R.; Buesing, T.; Peacock, P.; Sen, S. Who is the deal-prone consumer? In *Advances in Consumer Research*; Hunt, K., Ed.; Association for Consumer Research: Ann Abor, MI, USA, 1978; Volume 5, pp. 57–62.
59. Sharma, D.; Singh, S. Deal proneness and national culture: Evidence from the USA, Thailand, and Kenya. *Int. Mark. Rev.* **2018**, *35*, 981–1008. [CrossRef]
60. Dawra, J.; Katyal, K. Decoding price promotions: A moderated mediation model of fairness, trust, and deal proneness. *J. Revenue Pricing Manag.* **2023**, *22*, 248–265. [CrossRef]
61. Ailawadi, K.; Neslin, S.; Gedenk, K. Pursuing the value-conscious consumer: Store brands vs. national brand promotions. *J. Mark.* **2001**, *65*, 71–89. [CrossRef]
62. Mayhew, G.; Winer, R. An empirical analysis of internal and external reference prices using scanner data. *J. Consum. Res.* **1992**, *19*, 62–70. [CrossRef]
63. Schneider, L.; Currim, I. Consumer purchase behaviors associated with active and passive deal-proneness. *Int. J. Res. Mark.* **1991**, *8*, 205–222. [CrossRef]
64. Lichtenstein, D.; Burton, S.; Netemeyer, R. An examination of deal-proneness across sales promotion types: A consumer segmentation perspective. *J. Retail.* **1997**, *73*, 283–297. [CrossRef]
65. Çınar, K.; Yetimoğlu, S.; Uğurlu, K. The role of market segmentation and target marketing strategies to increase occupancy rates and sales opportunities of hotel enterprises. In *Strategic Innovative Marketing. and Tourism*; Springer: Cham, Switzerland, 2020; pp. 521–528.
66. Nezampour, M.; Rojuee, M.; Jafari Titkanloo, S. Market segmentation of nuts and dried fruits based on customers' expected values using DBSCAN algorithm. *Comm. Sur.* **2022**, *19*, 45.
67. Schlegelmilch, B.B. Segmenting, targeting, and positioning in global markets. In *Global Marketing Strategy: An Executive Digest*; Springer International Publishing: Cham, Switzerland, 2022; pp. 129–159.
68. Dana, J.D., Jr.; Williams, K.R. Intertemporal price discrimination in sequential quantity-price games. *Mark. Sci.* **2022**, *41*, 966–981. [CrossRef]
69. Chen, H.; Marmorstein, H.; Tsiros, M.; Rao, A.R. When more is less: The impact of base value neglect on consumer preferences for bonus packs over price discounts. *J. Mark.* **2012**, *76*, 64–77. [CrossRef]
70. Choudhary, V.; Vithayathil, J. The impact of cloud computing: Should the IT department be organized as a cost center or a profit center? *J. Manag. Inf. Syst.* **2013**, *30*, 67–100. [CrossRef]
71. Gupta, S. Impact of sales promotions on when, what, and how much to buy. *J. Mark. Res.* **1988**, *25*, 342–355. [CrossRef]
72. Liu, H.; Lobschat, L.; Verhoef, P.C. Multichannel retailing: A review and research agenda. *Found. Trends Mark.* **2018**, *12*, 1–79. [CrossRef]
73. Mela, C.F.; Gupta, S.; Lehmann, D.R. The long-term impact of promotion and advertising on consumer brand choice. *J. Mark. Res.* **1997**, *34*, 248–261. [CrossRef]
74. Namin, A. Revisiting customers' perception of service quality in fast food restaurants. *J. Retail. Consum. Serv.* **2017**, *34*, 70–81. [CrossRef]
75. Nunes, J.C.; Drèze, X. Your loyalty program is betraying you. *Harv. Bus. Rev.* **2006**, *84*, 124–131.

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