

Universität  
zu Köln



Düsseldorfer Institut  
für Wettbewerbsökonomie

Heinrich-Heine-Universität Düsseldorf

# Price Differentiation and Dispersion in Retailing

Prof. Dr. Werner Reinartz  
Prof. Dr. Justus Haucap  
Dr. Nico Wiegand  
Jun.-Prof. Dr. Matthias Hunold



**IFH** Förderer

# PRICE DIFFERENTIATION AND DISPERSION IN RETAILING

## **Prof. Dr. Werner Reinartz**

Chair for Retailing and Customer Management

Universität zu Köln

Phone: +49 (221) 470 5751

E-Mail: reinartz@wiso.uni-koeln.de

## **Dr. Nico Wiegand**

PostDoc

Universität zu Köln

Phone: +49 (221) 470 4364

E-Mail: wiegand@wiso.uni-koeln.de

## **Prof. Dr. Justus Haucap**

Director

Duesseldorf Institute for Competition Economics (DICE)

Heinrich-Heine-Universität Düsseldorf

Phone: +49 (211) 811 5494

E-Mail: haucap@dice.hhu.de

## **Jun.-Prof. Dr. Matthias Hunold**

Assistant Professor for Economics, especially for Industrial Economics

Duesseldorf Institute for Competition Economics (DICE)

Heinrich-Heine-Universität Düsseldorf

Phone: +49 (211) 811 0266

E-Mail: hunold@dice.hhu.de

The focus study of the IFH-Förderer annually examines a strategically important topic for retail. In the process, individual aspects of added value in retail are examined in detail and relevant implications for the entire retail landscape and for politics are derived. The focus study of the IFH is largely supported by the Presidium of the IFH-Förderer. Since dynamic pricing is currently being discussed in many ways, the focus in 2017 will be on price differentiation in retail as a highly relevant topic. Here a holistic view takes place: literature, company and market perspective as well as consumer view. For this purpose, a retailer workshop was conducted and around 2,000 consumers were interviewed in July 2017. In addition, prices of selected top products in the consumer electronics, perfume and footwear categories were collected online and stationary for four weeks. The IFH Focus Study 2017 was commissioned by the IFH-Förderer and the Handelsverband Deutschland (HDE).

## SUMMARY

Determining the “right” product price is one of the most dazzling challenges of modern retailing. Although the price as a marketing instrument has enormous influence on consumer decisions and corporate profits, those responsible for effective pricing and profitable price management continue to face significant difficulties. Progress in the field of digitization allows to set prices more dynamically and individually than ever before. This expands the decision-making space of companies and at the same time increases consumers’ concerns about excessive and unfair prices. However, the question arises whether everything that is technically possible can also

be successfully implemented in the market. The present study analyses corporate and consumer behavior and macroeconomic effects of pricing decisions under various conditions (static/dynamic, isolated/within market competition). The results show that the current debate about individualized prices expands well beyond the field of current corporate practice. Retailers are particularly conservative towards certain types of price differentiation such as short-term adjustments depending on the time of day or even customer-specific prices. In addition, there is a large number of market barriers that conflict with particularly controversial practices of price differentiation. The

study provides insights on how price differentiation can be used to achieve a balance between company interests and consumer protection. Finally, differentiated prices can have a welfare-enhancing effect when companies are customer-oriented and rules of fair competitive policy are in place.

## 1 INTRODUCTION

### AN OLD DEBATE IS REKINDLED

In the last two years, policymakers and the public have been increasingly discussing the possibilities and consequences of greater price differentiation, particularly in online retailing. In particular, so-called personalized prices, i.e. prices for the same products at the same point of time that vary for different individuals, are the focus of some critics. Similarly, dynamic pricing, product prices that vary over time, received its portion of scrutiny. The subject got very critical opinions not only from individual politicians<sup>1</sup> and consumer protection initiatives<sup>2</sup>, but also from the president

of the German Bundeskartellamt (Federal Cartel Agency)<sup>3</sup>.

In fact, technical progress – or more precisely machine learning – can now provide probably better assessments of customer’s willingness to pay than ever before. Nevertheless, price differentiation is as old as trade itself. One can think of a fruit and vegetable vendor at a marketplace. In order to sell the perishable products, which will be wasted otherwise, the merchant would sell them at a substantial discount. Thus, the late coming customer will be lucky to buy products of similar quality at a lower price. In this case, we are dealing with dynamic prices, i.e.

prices that strongly depend on timing. Today, we can still encounter such price differentiation. Gas stations can be a good example for retailers who frequently alter prices, making fuel more expensive in the morning than in the afternoon. However, the underlying reason in this case is not perishability, but competition between gas stations and change in demand. As result, prices change throughout the day.

The described dynamic pricing represents an example of a specific form of differentiated prices. Generally, price differentiation is defined as offering the same or a similar product at different prices by the same firm

<sup>1</sup> <http://www.faz.net/aktuell/finanzen/meine-finanzen/geld-ausgeben/johannes-remmel-will-individuelle-preise-im-internet-stoppen-14044329.html>

<sup>2</sup> <http://www.svr-verbraucherfragen.de/themen/themen/personalisierte-preise/>

<sup>3</sup> <https://www.golem.de/news/kartellamt-mundt-kritisiert-individuelle-preise-im-onlinehandel-1707-128937.html>

# PRICE DIFFERENTIATION AND DISPERSION IN RETAILING

(Phlips 1983; Varian 1996). It is used to take advantage of customers' different willingness to pay either because of differences in the valuation of a good (the good has a higher subjective value for consumer 1 as for consumer 2) or in the evaluation of financial resources (1€ has relatively lower value for consumer 1 than for consumer 2). Therefore, customer heterogeneity is a necessary condition for price differentiation (Besanko, Dubé and Gupta 2003; Reinartz 2001).

The main motivation for companies to use price differentiation is to increase its profits, either through realization of higher margins with the same heel (Agrawal and Ferguson 2007) or through development of further target groups and increase in sales through specific discounts or other privileges (Phlips 1983). In fact, it has been shown that successfully implemented price differentiation can achieve precisely these objectives and sometimes offers considerable financial advantages (Hanks, Cross and Noland 1992; Smith, Leimkuhler and Darrow 1992; Wirtz and Himes 2003; Guadix et al. 2010). A series of empirical studies show that depending on the type of price differentiation, corporate profits can be increased up to 34% compared to a uniform price strategy (Khan and Jain 2005). For Netflix, for example, potential profit increases of up to 12% have been calculated, provided that around 5,000 variables are used for price optimization (Shiller 2014). In addition, consumers can also benefit from a differentiation strategy when prices are

lower than what they would be under a uniform price strategy. Owing to the earnings prospects and often simple implementation, price differentiation continues to be a popular means of pricing policy.

## PRICE DIFFERENTIATION AND PRICE DISPERSION: AN OVERVIEW

Price differentiation and price dispersion should be differentiated. While the former is done by the same retailer or manufacturer, the latter is a result of different pricing by different competing companies. The two forms can appear in many cases. For a better overview we will only focus on the differentiation between static and dynamic pricing (Figure 1); price dispersion is added by including competition. First, an individual

company decides to offer either uniform prices or differentiated prices for certain products at one point in time (static price differentiation: quadrant 1). It can choose between channels (e.g., online vs. offline, online price search engines vs. direct entry) and customer segments (e.g., high-value vs. low-value customers, students vs. employees, classic quantity discounts) up to individual customer prices. If you also consider the adjustment of prices over time (dynamic price differentiation: quadrant 2), different prices can be charged depending on the time of day, weekday, month and season. In special cases of product innovations, certain price evolutions can be specified. The latter is prevalent, for example, as skimming pricing in the domain of consumer electronics: Innovations are priced higher at market launch in



Figure 1: Dimensions of Price Differentiation

order to skim the willingness-to-pay of particularly innovative consumers (so-called “early adopters”). The slower adopters then buy the same goods later at lower prices (cf. Coase 1972). Another widespread form of dynamic price differentiation is yield pricing, which can be observed for hotel and flight bookings. For example, the closer the time of departure, the higher up the ticket prices climb. If prices are adjusted and disclosed in this way over time, but equally for all customers, it is also referred to as a “weak” form of price differentiation (Reinartz 2001). If, on the other hand, a company changes prices over time and between customer groups without these differences being apparent to the individual customer, we speak of “strong” price differentiation.

However, the individual company does not operate in a non-competitive environment. In addition to the possible differentiation of its prices, it must also take competitors’ pricing into account. At a certain point in time, this results in different prices for the same product from different vendors (quadrant 3). As a rule, such prices vary over time, so that the provider must continuously monitor and, if necessary, adjust its price position (quadrant 4).

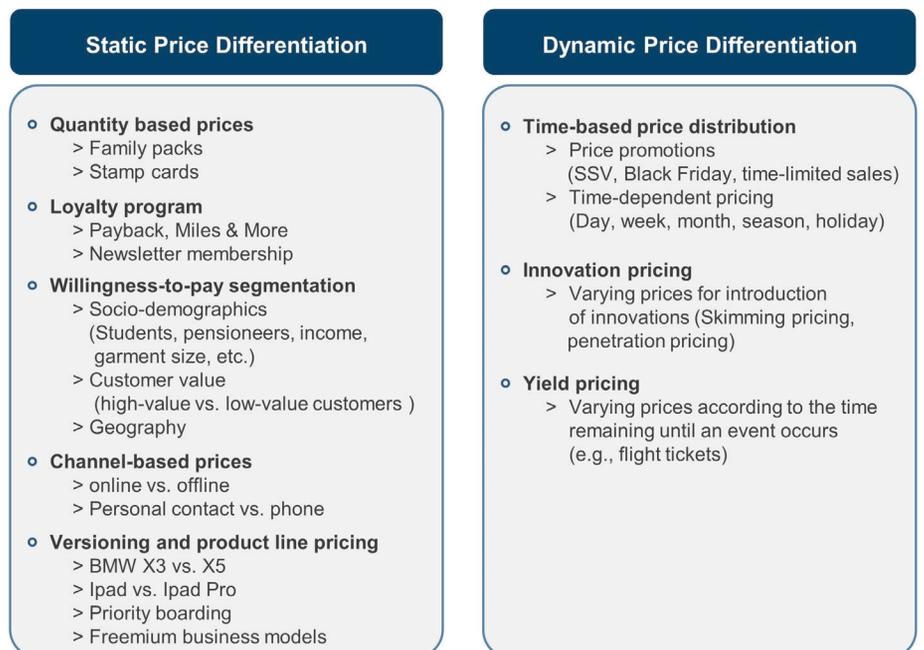
From the customer’s point of view, the pricing literature also makes a distinction between posted prices and price discovery (Elmaghraby and Keskinocak 2003). The first approach describes a pricing completely determined by the provider, in which

the customer has no possibility of achieving a different price (take-it-or-leave-it). An example of this is senior discounts, which are granted depending on the age of the customer and over which the customer has no influence. The latter approach gives the customer some degree of control over the price paid. This works via self-selection mechanisms (e.g., channel selection or selection of the premium version of a product) or even individual price negotiations (e.g., on auction platforms).

This distinction is also found in the economic literature. In addition to perfect price differentiation, which is also referred to as first-degree price differentiation, a distinction is

made between the exogenous and endogenous sorting of customers. Endogenous sorting, in which customers choose the most suitable tariff, is referred to as second-degree price differentiation, while exogenous sorting (from the customer’s point of view) is carried out by providers on objectively identifiable characteristics. Examples of this third degree price differentiation are senior discounts, (geographical) price differentiation by supplier country or different prices for men and women.

A selection of the various possibilities for price differentiation with different degrees of price influence by customers is shown in *Figure 2*.



**Figure 2:** Examples of Different Types of Price Differentiation

## RESEARCH FOCUS AND QUESTIONS

In analyzing price differentiation measures, we look at three distinct perspectives: namely the corporate, consumer and economic perspective. The company perspective focuses on a descriptive view of pricing and price differentiation and provides an overview of the challenges and current courses of action. In concrete terms, the aim of the analysis is to answer the following research questions:

- (1) What pricing challenges do retailers face today?
- (2) How do retailers set prices in

the market (over time and between channels)?

To answer these questions, we conducted in-depth discussions with managers of major retail companies, observed prices in the market, and engaged in extensive literature research. In the next section, we will focus on the analysis of individual consumer behavior aiming to systematize the perception and effect of differentiated prices on the consumer. This part of the study is based on the following questions:

- (1) What do consumers know about (differentiated) prices?

- (2) How do consumers perceive actual price differentiation?
- (3) How do different forms of pre-differentiation affect customer attitudes and behavior?

Finally, focussing on society as a whole, it is necessary to derive economic policy implications. This raises a question which welfare effects and possibly also redistribution effects are triggered by price differentiation. We have investigated that through a review of the economic literature. Based on these analyses, we summarise the implications for clients, trade, and policymakers in Section 5.

## 2 PRICE DIFFERENTIATION FROM THE COMPANY PERSPECTIVE

To analyse the company perspective, we conducted an expert workshop and observed retail prices over time. Specifically, in May 2017, we discussed price challenges with managers of major retail companies in Germany. We were able to gain deep practical insight into the retailer and industry view. The following pricing issues have proved to be particularly relevant in practice:

1. *General pricing*, i.e. finding optimal pricing strategies, independent of differentiation and individualization measures;
2. *Price harmonization/differentiation* between sales channels, i.e. pricing decisions of multi-

channel merchants

3. *Right price reference in the competitive environment*, i.e. determining the relevant market and finding (price-) relevant competitors;
4. *Price differentiation for different customer groups which can be narrowed down to individualization*, i.e. behavioral or characteristics-related as well as time-dependent changes in prices as a future topic.

The order shows that the majority of retailers are currently still dealing with fundamental pricing issues. A current topic in the course of digitization is the coordination of pricing in stationary

and online retailing. However, dynamic or even customer-specific pricing does not yet have priority in 2017/2018.

In July 2017, we observed both stationary and online retail prices over a four-week period. The research was conducted in 3 product categories: perfume, shoes and consumer electronics. The selection of categories is based on a differentiated mix of various attributes (online share of the overall market, price sensitivity of consumers, buying frequency), which can result in differentiated price developments.<sup>4</sup> Subject to the price observations were 15 stationary and online Amazon bestsellers per category. As a result, we collected 3,446 stationary prices with

<sup>4</sup> Price vs. brand orientation (VuMA Touchpoints 2017); Online share (HDE Online-Monitor 2017); purchase frequency (IFH Köln 2017)

two observations per week and 299,513 prices online with two observations per day. While prices online were automatically scanned twice a day from the amazon.de, Google Shopping and idealo.de websites, the stationary prices in the corresponding stores were collected manually via store visits.

First of all, it is interesting to compare the observed prices with the manufacturers' so-called recommended retail price (RRP). If all dealers adhere to a (uniform) RRP, there would be no price differentiation for the product in question. Overall, 76% of prices were below RRP, with average discounts of 6% for electronic products, 30% for perfume and 20% for footwear. This is a strong indication that retailers typically use their own pricing leeway instead of just implementing the price suggestions of product manufacturers. It is also evident that the price level on the Internet is predominantly below the stationary level. For example, 80% of product-specific average prices across the three product categories are cheaper online than stationary. For electronic products, the ratio is more balanced. The observation of lower online prices is consistent with the assumption that variable distribution costs on the Internet are often lower and competitive pressure is higher than in stationary distribution.

It also shows that while stationary prices change rather rarely, prices on the Internet change quite frequently. The stationary dealers did not change prices in 88% of observations. In

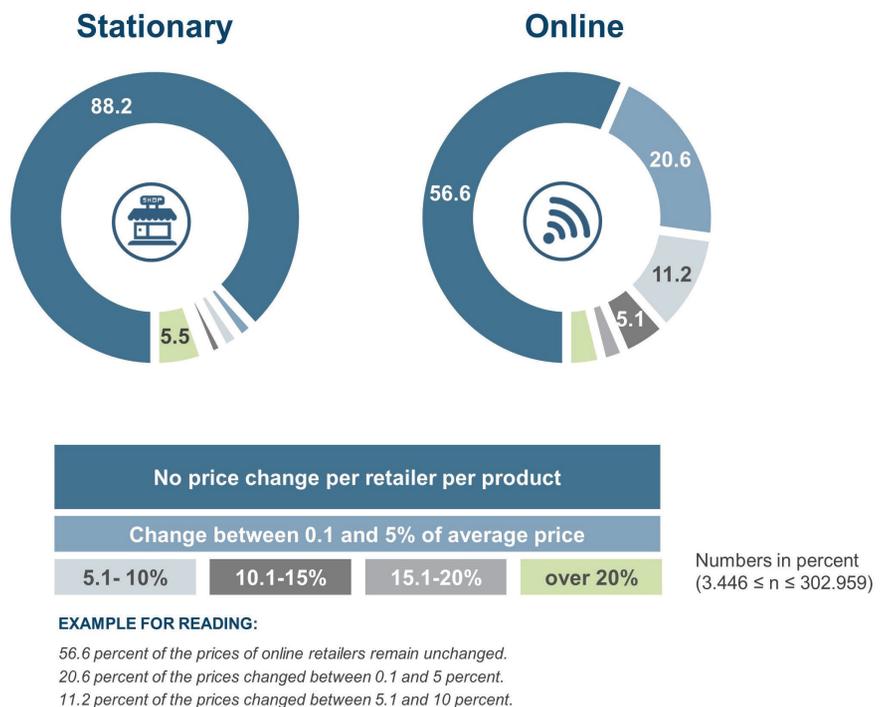


Figure 3: Frequency and Magnitude of Stationary and Online Price Changes

contrast, online prices remained unchanged by merchants in only 57% of cases. If online prices change, one third of retailers vary their prices by up to 10% (Figure 3).

If prices in the consumer electronics and perfume categories are adjusted many times, the one-time change in percent is lower than when a price change is performed only a few times. In the case of shoes, on the other hand, there is no clear correlation.

Overall, our expert discussions and market observations provide a somewhat surprising picture. When it comes to pricing, the challenges for retail companies are still primarily of a classic nature. There are many

technical aspects that limit the scope for implementing differentiated prices. An important "digital" topic is the coordination of prices between stationary and digital retailing. Analysis of prices over one month shows that retailers use their price corridor to set prices different from the RRP. Overall, there is a clear price dispersion, which means that different dealers ask different prices for the same product at the same time. Rates on the Internet are typically lower than in physical stores. Here, pricing is also less dynamic. Almost 90% of the prices within the observation month remained unchanged. On the Internet, 43% of the prices changed at least once within the observation period.

### 3 PRICE DIFFERENTIATION FROM A CONSUMER PERSPECTIVE

With regard to the consumer perspective, the main question is whether consumers are able to recognize differentiated prices and how this knowledge affects purchase and repurchase. In order to answer that, we asked more than 2,000 consumers about their experiences in a representative survey and conducted a scenario experiment exposing them to different types of price differentiation. Once again, we used the three categories perfume, shoes, and consumer electronics. In particular, we aimed to answer three questions:

1. What do consumers know about (differentiated) prices?
2. How do consumers perceive actual price differentiation?
3. How do different forms of pre-differentiation affect consumer attitudes and behavior?

#### PRICE SEARCH BEHAVIOR AND PRICE KNOWLEDGE

Awareness is the decisive factor for the effect of price differentiation on consumer behavior. As part of "Fencing" (Zhang and Bell 2010), companies endeavor to avoid making differentiated prices obvious to consumers. While such efforts were relatively easy to implement in the pre-digital age, price comparisons between different providers are now possible online at low search costs. So it is not surprising that consumers research prices mainly on the Internet. Our research shows that prices are sought both for the product purchased later and for product alternatives.

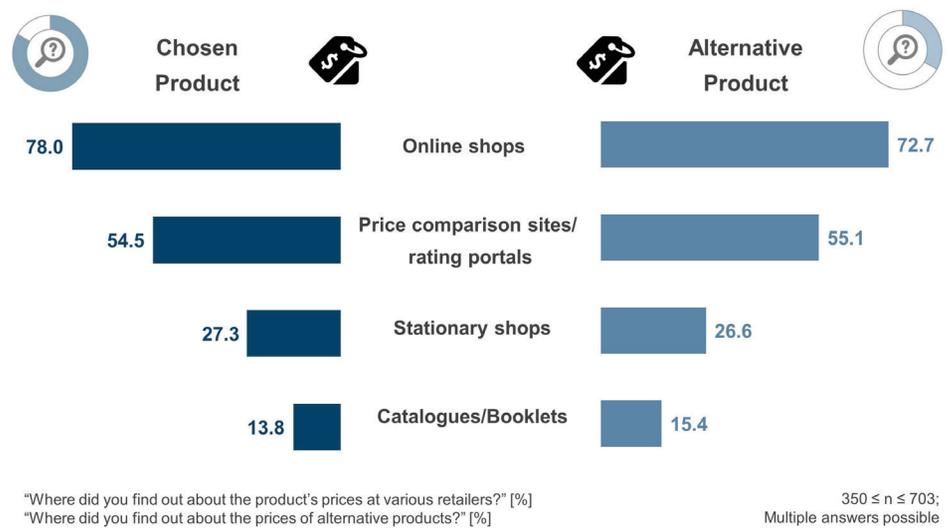
Price comparison sites (e.g., idealo.de, guentiger.de) play a decisive role alongside the online shops themselves. However, at least one in four consumers also uses stationary shops to obtain price information (Figure 4).

For many consumers, price research is a fixed element of the pre-purchase phase. However, it can be assumed that this, just like price orientation as a whole, is also subject to a certain degree of heterogeneity, meaning that there are distinct segments with different price sensitivity. On the basis of various questions on price setting, we have therefore divided our sample into two categories (1: strong price orientation, 2: average price orientation) and analyzed their respective characteristics. It can be seen that only very few consumers have a really low price orientation, which means that the overall price is

an important purchasing factor for almost all participants.

Contrary to the intuitive assumption, the group of very price-oriented buyers is in fact comparatively young, digital and has a high-income. More than half are younger than 39 years, 42% (35%) of the strongly (average) price-oriented buyers generate a net household income of over 3,000€. Almost a third (27%) increasingly purchases products on the Internet (average price orientation: 19%) and uses smartphones frequently (25% vs. 10% smart consumers). With regard to price search, this segment also makes increased use of various channels (multi-channel price search).

On the basis of the often intensively conducted price research, consumers usually obtain a fairly exact idea of the desired product and possible alternatives. For example, 60% (average



**Figure 4:** Sources of Price Search by Consumers

price orientation) and 75% (strong price orientation) of consumers say that they know the price range very well before making a purchase. But even the purchase itself often does not mark the end of the price research: at least 50% of the consumers surveyed have seen their product again in retail stores or online after the purchase, of which just under 10% observed a more favorable price. Reactions ranged from anger and active complaints to return of the product or request for reimbursement of the price difference.

All in all, it can be said that in times of constantly growing e-commerce sales it is extremely difficult for companies to conceal differentiated prices. Above all, price differences between dealers are easily uncovered by price search engines or direct shop comparison. The desire of some companies to have their price differentiation concealed and keep it unnoticed is, in our opinion, a misguided failure and is very unlikely to be implemented effectively. Also very important: completion of the purchase does not necessarily mark the end of the interaction. Especially in online retailing, the return rates still represent an enormous economic challenge. Although price discrimination is not the only reason for the return of purchased products, it can certainly be regarded as an important return driver. In the following, we would like to shed light on which types of price differentiation cause such consumer behavior and whether these types are perceived differently.

## PERCEPTION AND IMPACT OF DIFFERENTIATED PRICES

### Current state of research

A large number of scientific studies deals with the effects of price differentiation on consumer behavior. An often examined aspect is the perceived price fairness (e.g., Anderson and Simester 2008; Darke and Dahl 2003; Greenberg 1987; Wu et al. 2012; Xia, Monroe and Cox 2004). Perceived fairness is seen as the first link in a chain of possible consumer reactions to price differentiation, which can ultimately lead to termination of the business relationship by the consumer (Figure 5).

Price fairness is assessed by consumers in a relative manner, i.e., against a reference value (Xia, Monroe and Cox 2004). The reference value may be a

price previously paid for the product, a price paid by other consumers, prices of similar products or other distribution channels. The greater the positive deviation of the price from this reference value is, the more unfairly the price is perceived by the consumer.

When consumers evaluate a price differentiation measure, they first look at the fairness of the price rule itself (e.g., quantity discount vs. new consumer discount). They are guided by social or industry standards (Heyman and Mellers 2008; Maxwell 2002), but also by their own situation and how much they can identify with the rule. If the rule is considered fair, the likelihood that the measure as a whole appears fair also increases (Dickson and Kalapurakal 1994). This means that explanations of pricing decisions can have a positive effect on the assessment of the price

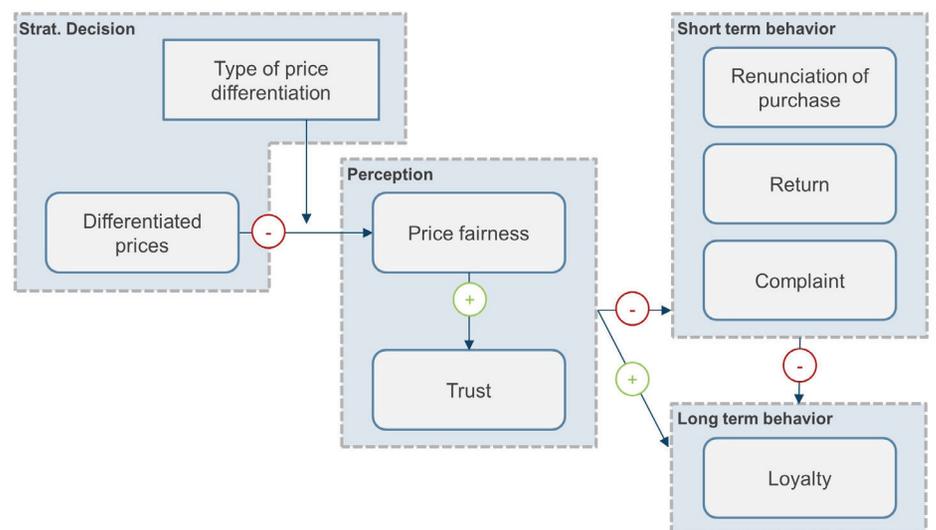


Figure 5: Perception and Effects of Price Differentiation on Individual Level

by consumers. (Folkes 1990; Xia, Monroe and Cox 2004). For example, rebates for seniors or students are often perceived as fair, as these population groups have a lower income.

The fairness of a price rule has a long-term effect that goes beyond a specific transaction: If consumers classify a price rule as fair, subsequent transactions based on similar rules are also classified as fair (Haws and Bearden 2006). Which other price rules are perceived as fair or unfair will be considered in more detail later on.

Closely linked to the price rule is the presumed motive behind a price change by the company. This also influences the assessment of price fairness by the consumer (Campbell 1999). If consumers suspect bad motives (such as pure greed for profit) behind a price increase, they will perceive this as unfair. On the other hand, however, there are price changes or types of differentiation that suggest an acceptable motive. For example, if a consumer has only a small turnover with a provider, she would usually not find it unfair if she received a lower discount. This assessment is due to the fact that companies can grant higher discounts on a higher margin without losing money. Higher prices are also considered more acceptable due to higher costs, as consumers are ready to give the supplier a certain margin unless they feel they are being exploited (Bearden and Netemeyer 2003; Thaler 1985).

The most important factor in assessing

price fairness is probably the similarity of the transaction. Generally, the more similar a transaction is to another, the more likely it is that price rules for differentiation are perceived as unfair (Xia, Monroe and Cox 2004). In similar transactions, consumers find it more difficult to find justifications for price differences (Anderson and Simester 2008). In dissimilar transactions, however, consumers can attribute different prices to these dissimilarities, which increases perceived fairness.

The similarity of the transaction can be anchored in the price rule itself (e.g., children have free entry), but also vary depending on the situation, that is, on how similar the current transaction is to the specific consumer's situation (e.g., children up to 6 years have free entry, my child has just turned 7). However, the perceived fairness of the price rule depends on which dimension is the source of the similarity. To consider are:

- Similarity of the product
- Similarity to other consumers (segment-based differentiation)
- Similarity to other sales channels (channel-based differentiation)
- Proximity to time of differentiation (intertemporal differentiation)

A price differentiation that offers a lower price for an identical product, in the same channel, to a comparable consumer at the same time is perceived as highly unfair. In a large-scale field experiment, Anderson and Simester (2008) find an effect of surcharges for oversized clothes on the perceived fairness of the price. However, this result

only applies to those consumers who bought the smallest oversize. They had just missed the lower price, so they felt a high similarity to a transaction in which they would have paid a lower price. This consumer group thus considers the price premium to be the most unfair. In principle, price differences to other, similar consumers are perceived as particularly unfair (Haws and Bearden 2006).

In addition, there are other factors influencing perceived price fairness. If consumers can decide for themselves to a certain degree what price they pay (e.g., through different versions of a product - basis vs. premium), or learn price rules on the basis of recurring patterns (e.g., gas station prices), this control leads to a fairer perception of differentiation. Price auctions offer the consumer a maximum of control. Stable, trusting consumer relationships also increase fairness, as consumers do not assume that the company has bad motives (see motive of price differentiation) to capture different forms of price differentiation on the consumer side. Finally, consumers get used to the established price rules and accept differentiated prices as industry standards over time (Kimes 1994; Kimes and Noone 2002; Wirtz and Kimes 2007).

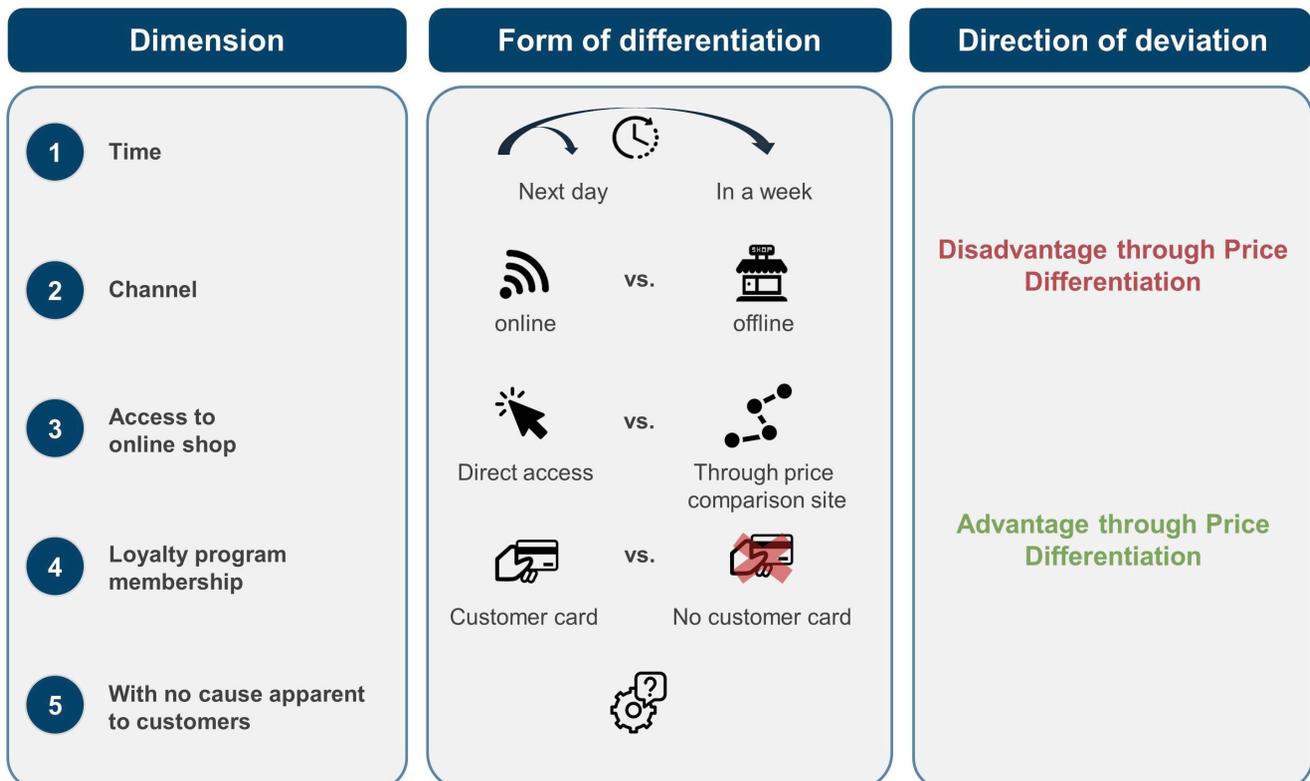
### Scenario experiment

The study of consumer reactions to price differentiation is methodologically not trivial, as a direct assessment of this practice leads to distorted results. In particular, it is not appropriate

to ask consumers what they think of differentiated prices - with a few exceptions, as the reactions would be negative. If, on the other hand, one asked for the evaluation of discounts, a concrete form of implementation of price differentiation, the reaction would probably be reversed. To avoid that, we have chosen an indirect survey method to capture different forms of price differentiation on the consumer side. For this purpose, we created purchase scenarios that included a disclosure of differentiated prices after the (fictitious) purchase of a product. Subsequently, consumer perceptions and behavioral

intentions were surveyed. Specifically, we investigated four forms of price differentiation (temporal, online vs. offline, online channel-based, loyalty program membership), each with two characteristics plus a situation of differentiation for no apparent reason. In addition, we have made a distinction between the consumer's disadvantage (price after purchase lower than at purchase) and the consumer's advantage (price after purchase higher than at purchase) through price differentiation. The 2,000 study participants<sup>5</sup> were each randomly assigned to one of the 18 [(4 x 2 + 1) x 2]

scenarios that emerged. Comparison of the groups provides information on the perception of the different forms of price differentiation and their effects on consumer behavior. The price difference was set at 15%. *Figure 6* summarizes the experimental design. In principle, it can be said that consumers find differentiated prices almost entirely unfair. This is one of the key findings of our study. This is the case even if they paid a lower price, i.e., they were favored by differentiation. Thus - despite prevailing satisfaction with the price paid by the participants themselves - only just under 35% of



**Figure 6:** Perception and Effects of Price Differentiation on Individual Level

<sup>5</sup> The sample is representative for the Federal Republic of Germany by age and gender in July 2017.

the preferred participants perceive the price difference as fair across all groups (Top-2 view). As expected, the number for disadvantaged consumers is even lower at 15%. Consumers with a price advantage rather attribute this circumstance of being favored to chance, fearing that they will not be protected from higher prices when making their next purchase. This lack of control over which side of the price difference you find yourself on as a consumer ultimately leads to a feeling of unfairness.

In addition, we can identify significant differences between the different forms of price differentiation. The fairest way to receive favorable prices is a loyalty program (owners of so-called consumer cards). Loyalty program members are expected to benefit from their membership and better prices is one way to realize such benefits. This result corresponds to the mechanisms discussed above: Membership in a loyalty program is brought about through "self-selection", i.e., consumers decide on their own authority whether they wish to participate. This change in status is therefore subject to a high degree of control by the consumer. It is also generally accepted that members enjoy certain privileges (in particular discounts) and in return disclose their personal data and purchasing behavior to the company. In addition, consumer cards have existed for some time already, so that a certain accustoming effect can be assumed. It must be borne in mind, however, that even with this measure, which is perceived as

relatively fair, every second consumer with a price advantage still expresses doubts about its fairness and just below 75% of disadvantaged consumers do not consider such discounts to be fair, either.

Depending on the design, the classic dynamic price differentiation (= different prices at different times) is comparatively acceptable for consumers - at least if prices are not changed on short notice. If a consumer paid a lower price for the same product one week after the actual purchase, "only" 80% of the participants felt this was not fair. If, on the other hand, the product is already cheaper the next day, this figure rises to just under 90%.

The discrepancy between the fairness assessment of favored and disadvantaged consumers is strikingly high when it comes to the often discussed channel-dependent pricing. 30% of consumers, and thus the second highest value of all differentiation measures, find it fair to have paid a lower price online than in retail stores. On the other hand, this figure falls below 15% if we consider the stationary buyers, who had to accept a correspondingly higher price. One possible explanation for these different perceptions lies in the attribution of the price difference. Online shoppers could attribute the lower price to their "smart" behavior, that is, they ascribe it to themselves to have discovered and used the price advantage. Ultimately, every consumer is theoretically free to obtain a better price online than

stationary (high control through the possibility of self-selection). On the other hand, however, offline shoppers may feel treated unfairly and may not attribute the higher price to their own abandonment of the online channel, but accuse the company of having an asymmetrical pricing policy. Especially for multi-channel merchants it is understood from the consumer's point of view that the underlying costs are allocated to *all* sales channels. Hence the higher service expenditures in stationary retail should not lead to different prices online and offline. Thus, despite the fundamental acceptance of the less favorable cost structure of in-store retailing, the disadvantage is assessed as unfair. This result tends to favor standardization of prices in various channels.

The rear runner in the evaluation of fairness is arbitrary price differentiation (which basically also includes prices based on different willingness-to-pay, so-called individual prices), the frequent change of prices over time (daily changing prices; see above) and the distinction between entry channels in online shopping (direct entry vs. entry via price comparison sites). The latter is already used by many companies as standard. *Figure 7* summarizes the effects based on the type of price differentiation.

Pricing practices perceived as unfair can affect both the current transaction (see above) and the future business relationship between merchant and consumer. The latter manifests itself above all in a decline in willingness

to repurchase and a fundamental loss of confidence in the retailer. After revealing differentiated prices, only 31% of disadvantaged consumers say they will reconsider the retailer when making their next purchase decision. This corresponds to a decline of 66% compared to a transaction without price differentiation. Even with a price advantage, the willingness to repurchase decreases significantly by 31%<sup>6</sup> (Figure 8).

A "before and after" comparison also reveals that price differentiation can significantly shake confidence in the retailer. This even applies to consumers who previously had extremely high levels of trust, especially in the retailer's pricing (Figure 9). But it is not only the confidence in the retailer's pricing that is affected. Differentiated prices affect different dimensions of trust, which can be specific, but also more general in nature. The basic image of the retailer as a reliable and trustworthy partner suffers the most. Surprisingly, however, a pricing policy perceived as unfair can even have a negative impact on very specific aspects such as product quality.

Figure 10 shows a selection of the effects of price differentiation on different evaluation measures.

Finally, differences in trust between different types of price differentiation become apparent, with similar implications as in the case of perceived fairness. Only a price advantage based on a loyalty program membership does

I find the price difference fair.

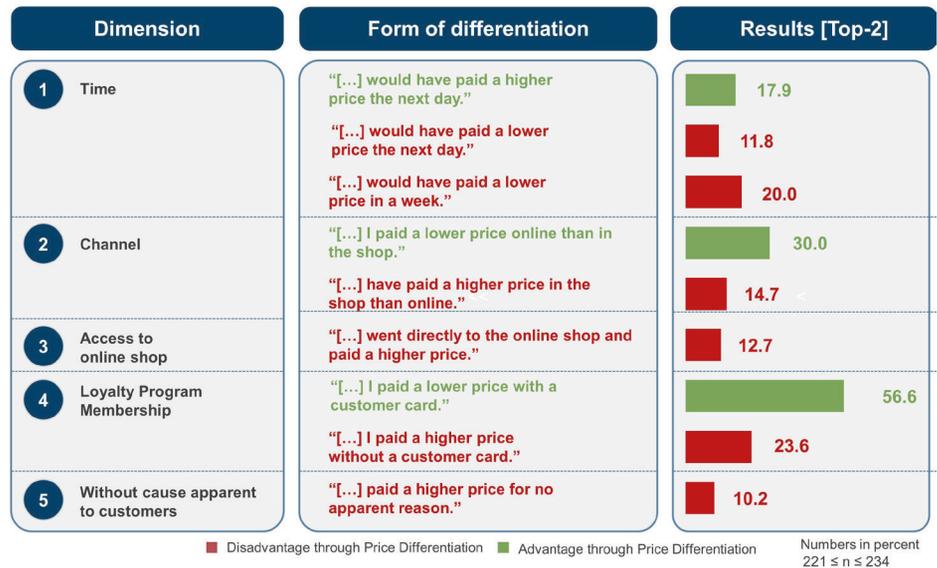
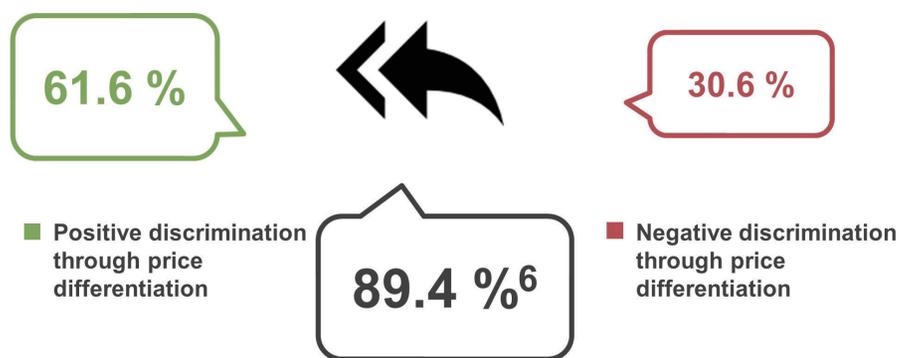


Figure 7: Perception of Price Fairness for Varying Types of Price Differentiation

Willingness to repurchase after experiencing price differentiation



"How likely is it that after the experience described in the situation you will consider the retailer again for a purchase?" 687 ≤ n ≤ 4.902

Figure 8: Effects of Price Differentiation on Repurchase Intention (Consideration Set)

<sup>6</sup> In comparison for the consideration set of repurchases without price differentiation, we refer to data from the ECC Success Factor Study, Vol. 6, which shows a value of 89.4% for the same industries (shoes, perfume, and consumer electronics) in online retailing.

# PRICE DIFFERENTIATION AND DISPERSION IN RETAILING



Figure 9: Trust in the Retailer Before and After Price Differentiation

not affect trust towards the company. The dynamic pricing measures have only a minor negative impact over time, especially low-frequent price adjustments. Moderate losses of trust are caused by different prices online and stationary and clearly negative effects are caused by differences between online channels (direct entry vs. entry via price comparison site) as well as differentiation without obvious reasons for the consumer.

## CONCLUSION CONSUMER PERSPECTIVE

Price differentiation is a delicate undertaking in a transparent market environment where information is spreading rapidly and the consumer has unprecedented power. Consumers are, to a large extent, very well informed about price differences. Differentiated pricing therefore often has consequences for the current transaction (complaint, return, reimbursement of the price difference) as well as for the future consumer relationship (trust, repurchase, loyalty). The situation is only slightly better if the consumer is favored by the price difference. Differentiated prices are almost always perceived as unfair and can lead to considerable damage to the business relationship and, ultimately, to a change of supplier.

However, there are differences in the way price differentiation measures are perceived. Particularly unfair practices often fail because of a lack of market acceptance. The direct and indirect sanction mechanisms imposed by

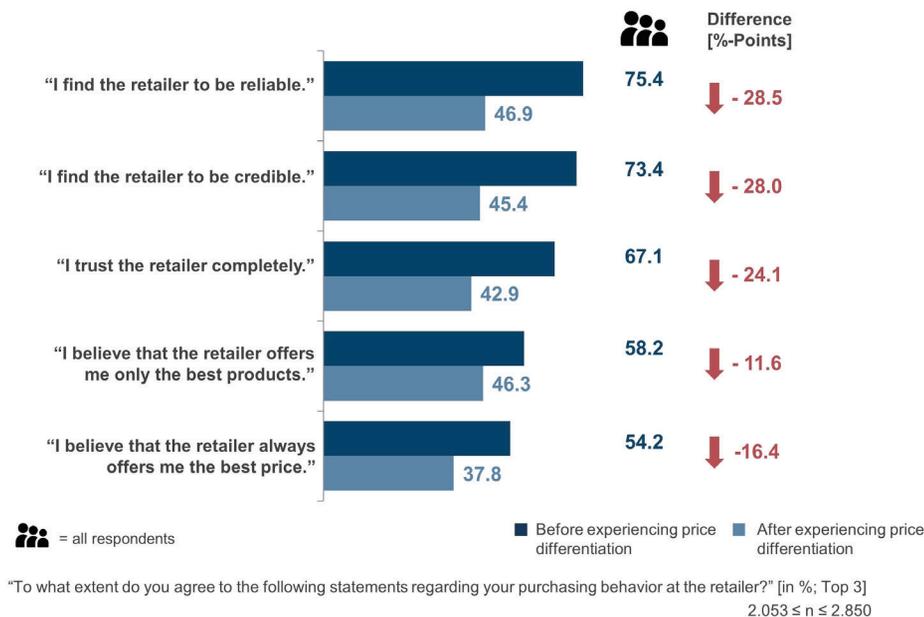


Figure 10: Loss of Trust All Along the Line

the consumer – reluctance to buy, product returns, repurchase behavior, (online) word of mouth, etc. – make it difficult for retailers to use truly discriminatory practices. It is therefore in the self-interest of retailers to implement sensible and acceptable pricing mechanisms. This also means

that companies should approach the issue with great caution so as not to jeopardize the valuable trust in their brand. The desire to maintain this trust serves as a natural and effective counter mechanism in order not to use price differentiation in a reckless way. We explain in more detail what

companies should look for in the concrete design of price differentiation when we present the implications for retailers (Chapter 5).

## 4 PRICE DIFFERENTIATION FROM AN ECONOMIC PERSPECTIVE

For an economic welfare analysis of differentiated prices, their effects on companies and consumers as a whole must be considered. Much of the existing literature shows that price differentiation has positive effects on the welfare of society as a whole. This applies in particular to B2C markets. Price differentiation in the B2C segment essentially has two effects: On the one hand, companies can – provided they succeed in establishing price differentiation in the market – increase margins with the customers willing to pay. This effect is neutral in terms of allocative efficiency, even if it implies redistribution effects. On the other hand, however, by differentiating prices, suppliers can accommodate customers who are less willing or able to pay, so that they are not excluded from consumption. This second effect induces the positive welfare effects compared to uniform prices.

Although the welfare effects in B2C markets often tend to be positive, there are also exceptions, which are mainly discussed in the theoretical literature.

The more recent behavioral economic literature (see Heidhues and Köszegi 2015) shows that price differentiation can have negative welfare effects if certain “naive” consumers are tempted to buy products that have a lower benefit or higher follow-up costs than expected when purchased.

An often cited example is overdraft interest on credit cards. Indeed, most examples of negative welfare effects of price differentiation have so far come from the financial sector, from insurance companies or from other sectors with longer-term contracts (e.g., in mobile telephony). Here, however, personalized prices have long been standard (e.g., for credit agreements, no-claims bonus discounts for car insurance). When renewing mobile phone contracts, individual bonuses for the extension have always been given. Recent theoretical work on credit card markets (Heidhues and Köszegi 2010, 2015, 2017) and somewhat older empirical work on the telecommunications market

(Narayanan, Chintagunta and Miravete 2007; Miravete and Palacios-Huerta 2014) show that less experienced consumers in particular can be disadvantaged by differentiated prices. Consumers who repeatedly misjudge their own behavior (such as overdrawing their credit card) regularly suffer from differentiated prices, as the literature shows. At the same time, however, undifferentiated tariffs lead to inefficiencies and disadvantages for certain customer groups with a low credit risk or a low risk of damage, particularly in the case of financial products or insurances, where default risks (for loans) or the risk of a loss (for insurance) regularly vary from individual to individual. A general assessment is therefore not appropriate even in these exceptional cases.

It should also be borne in mind that (a) the implementation of price differentiation – even when large amounts of data (“big data”) are available – is costly and (b) consumers often develop mechanisms to

circumvent price differentiation in response. This can result in additional transaction costs (such as search costs), which also reduce welfare. In extreme cases, there may even be an “arms race” in which providers develop increasingly sophisticated price differentiation mechanisms and consumers develop corresponding alternative mechanisms. Thus, in theory, the effects of price differentiation in the B2C area are not always clear, but depend on the individual case. By and large, however, contributions that expect positive welfare effects from price differentiation dominate.

Whether more differentiated or even personalized prices will prevail in a particular market also depends on a whole series of factors.

First, the ability of a company to differentiate prices tends to be limited by competition. In addition, buyers have the opportunity to arbitrage, i.e., to sell the products on a secondary market, for example. This has long been known from analyses of re-imports and parallel trade. However, such arbitrage is more difficult for products such as travel services (flights, overnight stays) and financial services (consumer credit, insurance), as contracts are regularly concluded by name. If customers can easily compare product prices on the Internet with price search engines before buying, there are limits to the personalization of pricing, at least in competition. However, in the case of financial services in particular, differentiation of interest rates and

insurance premiums is also to be expected in the case of competition, since the individual risks and thus the costs of the provision of services differ from one person to another.

Empirically, the question of whether price differentiation automatically decreases or even increases with increasing competition is not answered uniformly. Katz (1984), Borenstein (1985) and Holmes (1989), for example, show that price differentiation can survive in competitive markets and can even boost efficiency. However, price differentiation leads to redistribution not only from consumers to producers, but also among consumers, e.g., from frequent to infrequent users or vice versa. The industry most intensively studied in the empirical economic literature in terms of price differentiation is probably aviation. Borenstein and Rose (1994) and Stavins (2001), for example, find that price differentiation increases with increasing competition, while Gerardi and Shapiro (2009) come to the opposite conclusion. Chandra and Lederman (2016) show that other factors such as the extent and nature of consumer differences have a significant influence on how competition affects the extent of price differentiation. Verboven (1996) has demonstrated the extent of price differentiation by country in the European passenger car market. However, a possible ban on price discrimination can have ambivalent effects on competition. In extreme cases, such a ban can lead to suppliers withdrawing from a market and thus weakening competition.

In addition, price differentiation can also serve as a means of customer acquisition and market entry, so that a ban would make market entry more difficult and even weaken competition.

Second, companies are concerned that customers may feel unfairly treated if they pay more for the same product at the same time than anyone else (Richards, Liaukonyte and Streletskaia 2016; Vulkan and Shem-Tovb 2015) for no objectively identifiable and transparent reason (unlike, for example, senior or student rates). The risk of reputational damage may cause companies not to differentiate prices individually (Kalka and Krämer 2016). On the contrary, companies may even build a reputation for not differentiating prices but offering “permanently low prices”.

Third, with more individualized pricing, it is to be expected that counter mechanisms will develop, particularly on the Internet. There are already special platforms that provide information about discount coupons (Zander-Hayat, Reisch and Steffen 2016, pp. 403, 404 f.). Another example is the development of ad-blockers in response to increasing Internet advertising. If consumers notice, for example, that online prices are differentiated depending on the search history, terminal device, GPS location, etc., the development of technical countermeasures (such as hiding or simulating search histories or GPS locations) must be expected to protect consumers from high prices.

Currently, there is also hardly any reliable evidence for an increase in personally differentiated prices, as a study by Schleusener and Hosell (2015) commissioned by the Expert Council for Consumer Affairs at the Federal Minister of Justice and Consumer Protection has shown. While intertemporal price differentiation ("dynamic pricing") seems to be increasing to some extent (see Zander-Hayat, Reisch and Steffen 2016; Schleusener 2016), to date, there

is hardly any reliable evidence for an increase in personalized pricing. According to the study by Schleusener and Hosell, a price differentiation according to user characteristics and operating system was only apparent for high-priced package tours. However, such a price differentiation could not be proven for low-priced package tours or for the other experimentally tested sectors (tourism air travel, consumer electronics, sporting goods, fashion, insurance, toys, media/sound

carriers, food/pet food, drugstore, garden furniture). Even the decidedly critical Expert Council for Consumer Affairs conceded on its website that "personalized prices in practice have so far only been verifiable in isolated cases".

## 5 IMPLICATIONS

The number of current empirical studies on price differentiation is surprisingly low. However, there is much to suggest that sellers with active price differentiation can often increase their profits by expanding sales and/or increasing the average price. However, competition for individual customers may also increase if competing salespeople differentiate their prices on a customer-specific basis. This can reduce corporate profits. The extent of price differentiation is fundamentally limited by competition, arbitrage opportunities and customer information, but also by the consumers' sense of fairness.

Overall, the importance of price differentiation as a pricing policy instrument in practice is clearly overrated in public debate. This overestimation concerns in particular the newer forms of customer-specific

pricing across all sales channels as well as dynamic pricing in stationary retail. The general pricing in the market environment continues to represent the greater challenge for companies, in particular also the coordination of stationary and digital sales. Many companies lack not only the experience and knowledge (e.g., about individual willingness-to-pay) for profitable customer-specific and dynamic price differentiation, but also the appropriate technologies, such as electronic price tags in stationary retail. Another important restriction for companies is the acceptance of price differentiation by customers and society. A recent finding in this context is that the sense of fairness of customers regarding different prices, negative media coverage about appropriate measures, and consequently the possible reluctance to when prices are

perceived as unfair can represent an important restriction for companies. In other words, the protection of one's own brand equity takes on the role of a natural and important regulator.

### IMPLICATIONS FOR RETAILERS

Retailers face a number of challenges in implementing price differentiation. Despite the current exaggeration of the discussion about the possibilities of price setting up to individual prices, we assume that the importance of (acceptable forms of) price differentiation will increase in the future. This is due, on the one hand, to technical developments in digital technology and, on the other hand, is supported by accustoming effects. But not everything that is technically possible should be implemented. In particular, it is important not to put

customer trust and thus long-term business relationships at risk. Based on findings from previous scientific research and our own investigations, we recommend that you consider the following points when implementing price differentiation:

- An (apparently) indiscriminate differentiation between customers is to be avoided. Segment based price differentiation is enforceable on the market if there are acceptable reasons for differentiated prices (e.g., senior discount) and no bad motives are to be assumed (e.g., obvious profit maximization). Self-selection mechanisms such as versioning or loyalty programs are particularly suitable for giving customers the opportunity to find the most suitable offer for them at the respective price.
- A crucial point for fair price differentiation is the similarity of the transaction. The more customers, products, times and/or sales channels resemble each other at simultaneously different prices, the more unfairly the measure is perceived. To reduce the similarity between transactions, it makes sense to differentiate products to justify different prices.
- Individual pricing based on the customers' willingness to pay is not recommended for otherwise identical transactions. Rather, retailers should concentrate on putting together individual packages that differ between

customers. A lower willingness to pay often goes hand in hand with further purchasing behaviour, which merchants should use to differentiate between customers in a targeted manner that is acceptable to customers.

- If you choose dynamic prices, i.e., prices that vary over time, then the price changes should not follow one another too quickly. The longer the period of stable prices lasts, the fairer the price adjustment is for the customer.
- A higher degree of control over the price leads to the customer attributing a possibly paid price premium to herself (self-attribution) instead of seeking the "blame" for this with the company. Therefore, these price rules are perceived as fairer that either allow the customer to immediately exercise a certain degree of co-determination or to learn this through several transactions (e.g., finding the cheapest distribution channel).
- A stable customer relationship with a high degree of trust in the company prevents the assumption of lower motives behind a price differentiation and can thus increase the perceived price fairness. However, if this confidence is shaken by a questionable pricing policy, it becomes more difficult to impose price differences.
- Finally, price differentiation measures should not be introduced too abruptly. Over time,

learning lead to greater acceptance of price differentiation. Retailers should therefore cautiously enter the market, watch out for market reactions from customers and competitors and, if necessary, take further measures from there.

### IMPLICATIONS FOR CONSUMERS

Consumers can save money through attentive comparison and flexible shopping. For example, prices for the product categories examined in our market price observation – shoes, perfume and electronic equipment – are changing. Within one month, we have not seen any changes for almost 90% of the prices in over-the-counter retail. In the same period, 43% of prices on the Internet have changed once or several times. In 80% of cases, prices there are also lower than stationary prices. An overview of the prices before the purchase can therefore be worthwhile. In addition, 76% of the prices were below the recommended retail prices; in the case of perfume, for example, the discounts were at 30%. If a price is at the level of the RRP, it may well be worth asking or looking for a lower price. In addition, the sometimes high price dispersion in the categories examined makes it clear that the price is only one attribute for consumers, among many others. Consumers maximize their overall benefit, which also includes dimensions such as availability, service or advice – and are prepared to pay more than the lowest possible price.

## **IMPLICATIONS FOR POLICYMAKERS**

For the political discussion, it is important to keep in mind that according to established economic research price differentiation of end customers can often increase overall welfare. The economic effect of price differentiation vis-à-vis end customers is positive in that price differentiation enables companies to serve customers with lower willingness to pay at lower prices without forgoing margins with more solvent customers. Without price differentiation, companies would tend to set higher uniform prices, so that fewer customers with lower willingness-to-pay would be served. On the other hand, certain forms of

price differentiation ultimately limit competition at the expense of overall welfare. Fortunately, there are already proven antitrust rules against such predatory price tactics, so there is no new need for action as a result of this possibility.

In addition to the macroeconomic welfare effects, price differentiation can also lead to a redistribution of welfare benefits between businesses and consumers and between different consumer groups. Particularly where competition is less intense, companies may increase their profits by differentiating prices at the expense of consumers (even if more consumers are served). However, when competition is fierce, corporate profits will tend to fall

and many consumers will benefit from lower prices.

These findings speak primarily for an effective application of existing competition law and not for special regulations of price differentiation in retailing. The latter would mean a considerable encroachment on the freedom of contract, which appears neither adequate nor in its overall effect positive. Nevertheless, the relevance of regulations for data use and transparency for consumer protection remains undisputed. These can also help customers to stay informed about different prices, easily find the best offer and thus intensify competition for the benefit of customers.

## BIBLIOGRAPHY

- Agrawal, Vishal and Mark Ferguson (2007). "Bid-Response Models for Customised Pricing," *Journal of Revenue and Pricing Management*, 6 (3), 212–28.
- Anderson, Eric T. and Duncan I. Simester (2008). "Does Demand Fall When Customers Perceive That Prices Are Unfair? The Case of Premium Pricing for Large Sizes," *Marketing Science*, 27 (3), 492–500.
- Armsden, Gay C. and Mark T. Greenberg (1987). "The Inventory of Parent and Peer Attachment: Individual Differences and Their Relationship to Psychological Well-Being in Adolescence," *Journal of Youth and Adolescence*, 16 (5), 427–54.
- Bearden, William O. and Richard G. Netemeyer (2003). *Scaling Procedures: Issues and Applications*, Sage Publications, Inc.
- Besanko, David, Jean-Pierre Dubé and Sachin Gupta (2003). "Competitive Price Discrimination Strategies in a Vertical Channel Using Aggregate Retail Data," *Management Science*, 49 (9), 1121–38.
- Borenstein, Severin (1985). "Price Discrimination in Free-Entry Markets," *RAND Journal of Economics*, 16 (3), 380–97.
- and Nancy L. Rose (1994). "Competition and Price Dispersion in the US Airline Industry," *Journal of Political Economy*, 102 (4), 653–83.
- Campbell, Margaret C. (1999). "Perceptions of Price Unfairness: Antecedents and Consequences," *Journal of Marketing*, 36 (2) 187–99
- Chandra, Ambarish and Mara Lederman (2016). "Revisiting the Relationship between Competition, Patenting, and Innovation," *Rotman School of Management Working Paper No. 2477719*, 1–5.
- Coase, Ronald H. (1972). "Durability and Monopoly," *Journal of Law and Economics*, 12 (1), 143–49.
- Darke, Peter R. and Darren W. Dahl (2003). "Fairness and Discounts: The Subjective Value of a Bargain," *Journal of Consumer Psychology*, 13 (3), 328–38.
- Dickson, Peter R. and Rosemary Kalapurakal (1991). "Perceived Price Fairness and Dual Entitlement," *Advances in Consumer Research*, 18 (1), 788–93.
- Elmaghraby, Wedad and Pinar Keskinocak (2003). "Dynamic Pricing in the Presence of Inventory Considerations: Research Overview, Current Practices, and Future Directions," *Management Science*, 49 (10), 1287–1309.
- Folkes, Valerie S. (1995). "Consumers' Price Perceptions on Promoted Products," *Journal of Retailing*, 71 (3), 317–328.
- Gerardi, Kristopher S. and Adam Hale Shapiro (2009). "Does Competition Reduce Price Dispersion? New Evidence from the Airline Industry," *Journal of Political Economy*, 117 (1), 1–37.
- Guadix, José, Luis Onieva, Jesús Muñuzuri and Pablo Cortés (2011). "An Overview of Revenue Management in Service Industries: An Application to Car Parks," *Service Industries Journal*, 31 (1), 91–105.
- Hanks, Richard D., Robert G. Cross and Paul R. Noland (1992). "Discounting in the Hotel Industry: A New Approach," *Cornell Hotel & Restaurant Administration Quarterly*, 31 (1), 91–105.
- Haws, Kelly L. and William O. Bearden (2006). "Dynamic Pricing and Consumer Fairness Perceptions," *Journal of Consumer Research*, 33 (3), 304–11.
- Heidhues, Paul and Botond Köszegi (2010). "Exploiting Naïvete about Self-Control in the Credit Market," *American Economic Review*, 100 (5), 2279–2303.
- and Botond Köszegi (2015). "On the Welfare Costs of Naïveté in the US CreditCard Market," *Review of Industrial Organization*, 47 (3), 341–54.
- and Botond Köszegi (2017). "Naïveté-Based Discrimination," *The Quarterly Journal of Economics*, 132 (2), 1019–54.
- Heyman, James E. and Barbara A. Mellers (2008). "Perceptions of Fair Pricing," *Working Paper*, 683–97.
- Holmes, Thomas (1989). "The Effects of ThirdDegree Price Discrimination in Oligopoly," *American Economic Review*, 79 (1), 244–50.
- Kahn, Romana and Dipak J. Jain (2005). "An Empirical Analysis of Price Discrimination Mechanisms and Retailer Profitability," *Journal of Marketing Research*, 42 (4), 516–24.
- Katz, Jay (1984). "Why Doctors Don't Disclose Uncertainty," *The Hastings Center Report*, 14

(1), 35–44.

Kimes, Sheryl E. (1994), "Perceived Fairness of Yield Management," *Cornell Hotel & Restaurant Administration Quarterly*, 35 (1), 22–29.

——, Jochen Wirtz and Breffni M. Noone (2002), "How long should dinner take? Measuring expected meal duration for restaurant revenue management," *Journal of Revenue and Pricing Management*, 1 (3), 220–33.

Krämer, Andreas and Regine Kalka (2016), How digital disruption changes pricing strategies and price models, in: Khare, A., Stewart, B., and Schatz, R. (Hrsg.): *Phantom Ex Machina*, Springer, 87–103.

Maxwell, Sarah (2002), "Rule-based Price Fairness and its Effect on Willingness to Purchase," *Journal of Economic Psychology*, 23 (2), 191–212.

Miravete, Eugenio J. and Ignacio PalacioHuerta (2014), "Consumer Inertia, Choice Dependence, and Learning from Experience in a Repeated Decision Problem," *Review of Economics and Statistics*, 96 (3), 524–37.

Narayanan, Sridhar, Pradeep K. Chintagunta and Eugenio J. Miravete (2007), "The Role of Self Selection, Usage Uncertainty and Learning in the Demand for Local Telephone Service," *Quantitative Marketing and Economics*, 5 (1), 1–34.

Philips, Louis (1983), *The Economics of Price Discrimination*, Cambridge: Press, University of Cambridge.

Reinartz, Werner J. (2001), "Customizing Prices in Online Markets", *European Business Forum*, Issue 6, 35–41.

Richards, Timothy J., Jura Liaukonyte, and Nadia A. Streletskaia (2016), "Personalized Pricing and Price Fairness," *International Journal of Industrial Organization*, 44 (C), 138–53.

Schleusener, Michael and Sarah Hosell (2015), Expertise zum Thema "Personalisierte Preisdifferenzierung im Online-Handel," Untersuchung und Ausarbeitung für den Sachverständigenrat für Verbraucherfragen beim Bundesminister für Justiz und Verbraucherschutz. Available under [http://www.svr-verbraucherfragen.de/wp-content/uploads/eWeb-Research-Center\\_Preisdifferenzierung-im-Onlinehandel.pdf](http://www.svr-verbraucherfragen.de/wp-content/uploads/eWeb-Research-Center_Preisdifferenzierung-im-Onlinehandel.pdf) (last accessed 24.11.2017).

Shiller, Benjamin R. (2014), "First-Degree Price Discrimination Using Big Data," *Working Paper*, Brandeis University, 1–36.

Smith, Barry C., John F. Leimkuhler and Ross M. Darrow (1992), "Yield Management at American Airlines," *Interfaces*, 22 (1), 8–31.

Stavins, Joanna (2001), "Price Discrimination in the Airline Market: The Effect of Market Concentration," *Review of Economics and Statistics*, 83, 200–202.

Thaler, Richard (2010), "Mental Accounting and Consumer Choice," *Marketing Science*, 4 (3), 199–214.

Varian, Hal R. (1996), "Differential Pricing and Efficiency," *First Monday*, 1 (2), 1–10.

Verboven, Frank (1996), "International Price Discrimination in the European Car Market," *RAND Journal of Economics*, 27 (2), 240–68.

Vulkan, Nir and Yotam Shem-Tov (2015), "A Note on Fairness and Personalised Pricing," *Economics Letter*, 136, 179–83.

Wirtz, Jochen and Sheryl E. Kimes (2003), "Has Revenue Management Become Acceptable? Findings from an International Study on the Perceived Fairness of Rate Fences," *Journal of Service Research*, 6 (2), 125–35.

—— and —— (2007), "The Moderating Role of Familiarity in Fairness Perceptions of Revenue Management Pricing," *Journal of Service Research*, 9 (3), 229–40.

Wu, Chi Cheng, Yi Fen Liu, Ying Ju Chen and Chih Jen Wang (2012), "Consumer Responses to Price Discrimination: Discriminating Bases, Inequality Status, and Information Disclosure Timing Influences," *Journal of Business Research*, 106–116.

Xia, Lan, Kent B. Monroe and Jennifer L. Cox (2004), "The Price Is Unfair! A Conceptual Framework of Price Fairness Perceptions," *Journal of Marketing*, 68 (4), 1–15.

Zander-Hayat, Helga, Lucia A. Reisch and Christine Steffen (2016), "Personalisierte Preise – Eine verbraucherpolitische Einordnung," *VuR*, 31 (11), 403–9.

Zhang, Michael and Peter Bell (2012), "Price Fencing in the Practice of Revenue Management: An Overview and Taxonomy," *Journal of Revenue and Pricing Management*, 11 (2), 146–59.