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Ethical aspects of dynamic pricing

What to consider when modernizing your pricing approach

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Background

We are often confronted with ethical questions by our audiences when speaking about dynamic pricing. Our experience has shown that it is important to build a solid foundation of reasoning and a clear positioning on this topic when developing pricing strategies for companies. This Viewpoint structures the topic and inspires some thoughts, and we look forward to constructive follow-up discussions with you.

Shifts in supply and demand are occurring more often and more rapidly

The coronavirus pandemic offers a very recent showcase of extraordinary shifts in demand. Many stores across Europe sold out of hand sanitiser in just one day, and the same thing soon happened with non-perishable groceries (tinned food, pasta, flour, yeast, toilet paper etc.) and face masks. This shows just how rapidly supply and demand can affect the rationale behind your pricing methodology. But this is not the first such example. Many manufacturing industries relying on plastics were faced with existential threats as a result of volatile crude oil prices (e.g. in 2014–15), and the Fukushima disaster led to a severe shortage of raw iodine, used in the manufacture of products such as agrochemicals. These are just a few examples from recent history. On a very basic level, traditional town markets work in the same way: Crops are sold at competitive prices when in season and at higher prices when only few sellers can provide them, as this also inherently represents customer willingness to pay.

These kinds of extraordinary changes in supply and demand are not new, but new technology is making them more transparent. It also allows them to occur more rapidly, more frequently and across more locations.

Companies are trying to be more dynamic in pricing

Besides the many challenges in securing and optimising their supply chains, companies are concerned about revenue and profitability. This, in turn, brings pricing back into the spotlight.

Besides all the usual levers in pricing, companies are now taking another look at a number of questions: How quickly can we change prices? How frequently should we review them? How will customers react to price changes of more than the usual few percent per year?

Becoming more dynamic in pricing is not the same thing as implementing dynamic pricing. Moving from one price change per year to two does make you more dynamic – but it is not dynamic pricing. Dynamic pricing has three key characteristics: high frequency of price changes, price changes based on a combination of different factors, and automation of price changes by means of algorithms, which may even apply variable pricing strategies.

Most basic pricing strategies can be embedded into dynamic pricing, including cost-plus (e.g. in product configurators), competitor-based (e.g. at petrol stations) and value-based (e.g. in some retail businesses).

Companies are sitting on huge quantities of customer data, and they want to exploit this data so that they can use the most sophisticated algorithms available. But this raises a number of complex issues: What data do we have? What data can we legally make use of? What patterns do we see? Online-only players (e.g. in retail) have a particularly large advantage here, as they typically have large numbers of customer insights that can be directly mapped to customer transactions. Doing this in a traditional physical store is not easy, which is why many stores have introduced loyalty cards and rewards schemes to capture this information.

The following diagram illustrates the flow of information in a multi-channel environment:

External level

Customer demographics
Time
Weather
Supplier
Competitors
+ much more =
External information to be collected for input of HQ price setting

Head-quarter level

Headquarter
Sales/pricing team manages pricing updates and programmes & monitors algorithms

(Cloud) server
Cloud network receives price information and distributes to branches and supermarkets

Internal customer info for input of HQ price setting

Internal data base

Collected customer data transferred to internal data base

Branch level

Branch 1
Branch 2
Branch 3

Branch ESL system (with POS server)
Branch/supermarket server receives price information from cloud server and updates electronic shelf price labels

Gateway
Wireless connection transmits price to ESL

ESL software connects ESL system cashier system

Shelf level

1,99 €

ESL label & QR codes
Electronic shelf labels display real time adjusted prices according to dynamic price setting. Customer preferences to be collected via QR code scan

Basket level

Collect customer information via QR code scan or coupon

Cashier

Mobile app
Credit card
Cash

Customer data collection

Loyalty card
(retail or "refer-a-friend")

Data collection

The result: an ethical dilemma

Even if companies have access to in-depth customer insights, interpreting the data and deciding on a sound pricing strategy – or even just a single price change – is still difficult. If you lower your prices, you might make more sales, but your product could end up being perceived as less valuable. A customer might appreciate lower prices, but if everyone gets the same discount, it is no longer special to that customer.

If, on the other hand, you increase prices, will customers perceive the product as more valuable, or will they be put off buying altogether? And how would you feel, as a customer, if you found out that somebody else paid more (or less) than you did for the same product?

These issues present a considerable dilemma for your business. To navigate through it, you should consider several questions when thinking about your overall dynamic pricing strategy. This will enable you to structure the topic and find better solutions for you and the customer.

Relevant questions include: How expensive is too expensive for our customers, and at what point would excessive prices cause long-term damage to the brand? How big can an individual price change be? Where is the line between differentiation and discrimination? Having considered the questions, you then need to be able to automate decisions on these issues and embed them into your algorithms.

Any dedicated manager involved in pricing has struggled with such questions at some point. And while there is no single answer that will always give the perfect result, there are some common lines of thought that can help you define your dynamic pricing strategy.

What do customers think about dynamic pricing?

Customers have been used to dynamic pricing for quite a while. They often accept non-constant prices, and they sometimes do not even recognise the dynamic as such. Prices are significantly reduced in end-of-season sales, travel prices increase as the day of travel approaches, and petrol stations have constantly fluctuating prices.

So it is not a question of whether customers will accept dynamic pricing in general, but rather a question of whether they will accept it in contexts where they have not encountered it before. Analysing acceptance of dynamic pricing reveals a number of different aspects, which can be summarised into broader overall topics.

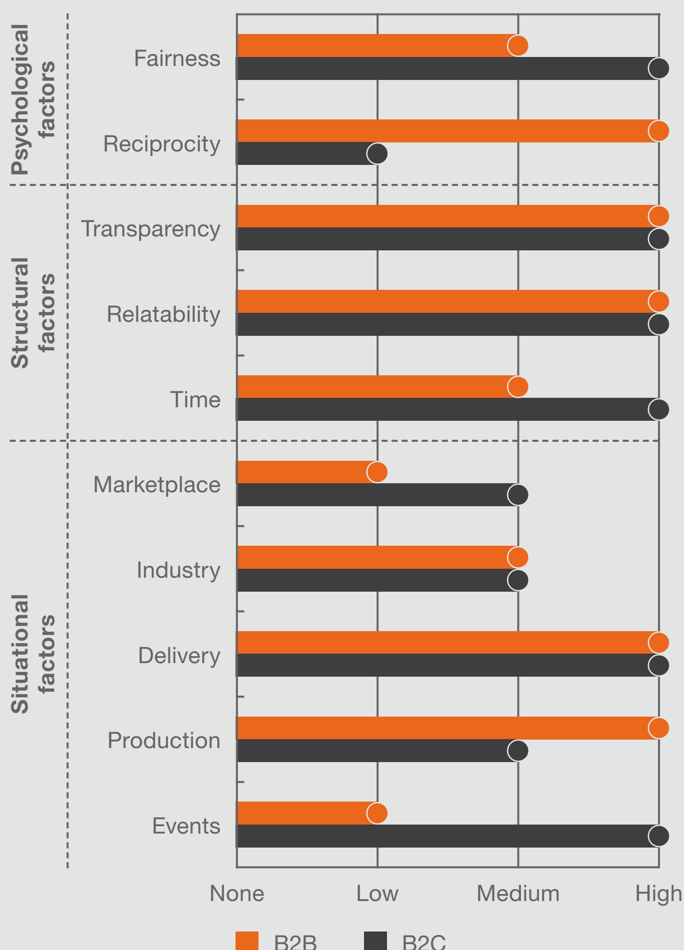
Dynamic pricing is not solely defined by time factors. Dynamic pricing can also mean that different groups of customers are charged different prices at the same time; discounts for students or pensioners are good examples.

This emphasises the fact that an individual customer will always accept dynamic pricing if the price that they are being charged is lower than their reference price. By contrast, companies need to be particularly careful about managing customer acceptance of prices higher than the customer’s reference price, especially if not all customers are charged a higher price. As a rule of thumb, companies should usually label the highest price of a product as the ‘standard’ price and other prices as ‘reduced’ prices, assuming such labelling is necessary at all.

Moderating factors of dynamic pricing

Several factors moderate the customers' acceptance and the impact of dynamic prices. They can be sorted into three big buckets – psychological factors, structural factors, and situational factors. Every company, every group of customers, and every situation will bring additional moderating factors, which will need to be analysed individually. Nevertheless, a few basic factors are present in every analysis. All of them have a different impact potential.

Impact of moderating factors of dynamic pricing



Psychological factors such as fairness and reciprocity play a major role in a person's assessment of decisions that affect them. These factors have been extensively studied in the field of behavioural economics.

Fairness

A customer is more likely to accept dynamic pricing if the same treatment is given to another person who the customer feels is similar to themselves. Opinions on the meaning of 'similar' may vary, but it is crucial that customers do not get the impression that similar customers are offered lower prices. The impression of having been treated unfairly can create strong negative feeling towards the seller. However, customers are open to explanations of who is considered to be a similar customer. This underlines the importance of transparency and relatability.

Reciprocity

Customers are also more likely to accept dynamic pricing if they get something in return for paying an increased price at certain times. For example, customers are willing to pay a higher monthly price if this allows them to terminate the contract more easily.

Structural factors include transparency and relatability. They can help customers understand the reasoning behind variable prices.

Transparency

The price mechanism is the foundation of transparency in pricing, and customers will treat it with scepticism if it is a black box. There is no need to fully explain the entire mechanism in detail. However, it is often sufficient to simply explain the basic rationale behind it. You can include an element of vagueness so that you do not have to reveal all the details to everybody (including your competitors).

Relatability

The better the customer can understand the pricing mechanism and relate to it, the more likely they are to accept it. This is why discounts for students or pensioners are almost never challenged by customers who have to pay the full price. Framing has a very strong impact on customer acceptance, so the message needs to be presented in the right way. "We need to charge you extra for changing your car's tyres because we are already working at full capacity." works much better than "We are charging you extra because it is December."

Time

Dynamic pricing is often associated with time-based factors. This means that the price varies over time, but the price at any one time is the same for all customers. This is generally accepted, as it is the kind of dynamic pricing that most people are used to. It also has the major advantage of treating every customer the same at any given point in time.

Situational factors also influence customer acceptance of dynamic pricing, but they cannot be managed as easily as the other factors.

If you are a plumber, for example, you cannot argue that your prices have increased because your plunger has gotten more expensive, but you could charge extra if the customer asks for an appointment at short notice. So these factors are intended more as guidelines as to the extent to which you can employ dynamic pricing for your product, what rationale you can use, and generally how difficult it might be to employ dynamic pricing.

Marketplace

Dynamic pricing on online marketplaces is well-known and widely accepted. Some online shops even notify their customers when the prices of products on their watch lists rise or fall. At the other end of the spectrum are conventional brick-and-mortar stores. Customers do not expect prices to fluctuate very much in these stores, although they will accept a limited level of change.

Industry

Consumers accept certain products as having fluctuating prices. Anything travel-related is a good example; the same is true of consumer electronics. However, prices of durable goods such as furniture usually remain constant, making dynamic pricing hard to establish.

Product delivery

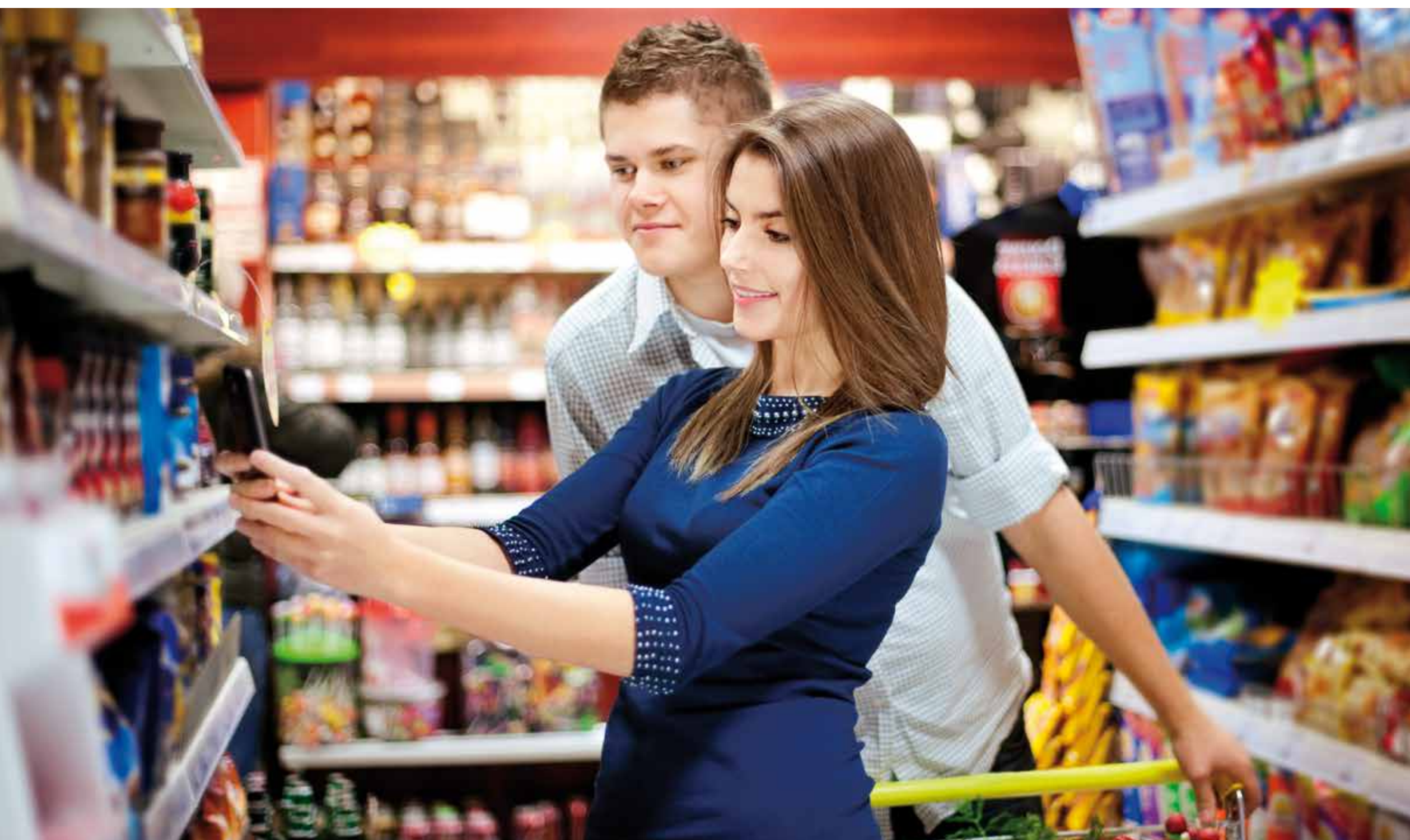
Customers are very often willing to pay more for faster delivery. If the pricing mechanism is transparent enough for the customer to understand that delivery services are in short supply, there is room for dynamic pricing.

Production

If your product is heavily based on a primary product that is scarce or subject to price fluctuations, customers will be more likely to accept dynamic pricing of the final product. Petrol prices are the perfect example: While motorists love to complain about petrol prices being too high in general, you rarely hear them complain about the price changes per se. If, on the other hand, your product is mainly based on services, you cannot easily use employee pay rises or increased taxes, fees, and duties as reasons for applying dynamic pricing as pay rises may actually be decided by your company, and taxes do not change very frequently.

Events

Customers are used to sales at the end of the season or on other special occasions such as Black Friday. They also understand the mechanics of increased prices when demand increases. However, they do not always realise that a particular event causes increased demand for a certain product, so it is sometimes necessary to make customers aware of the effect that an event has on demand.



Our approach

As understanding the rationale behind price changes is the most important step towards gaining customer acceptance, we at PwC typically recommend that you start by developing hypotheses about dynamic pricing use cases: What logical rationale could be applied in pricing? Which correlations will customers understand and accept? In the next step, we try to validate these hypotheses analytically, based on existing (but often unused) internal data, such as patterns of customer visits to online or offline stores in specific weeks. We also enrich internal transactional data with relevant external data – for example, correlating the weather with development of sales.

The exact steps strongly depend on your business and the environment you are working in. In online-only retail businesses, there are a number of more detailed factors that can be considered, such as product views, source of traffic, site history, and anything else you can legally draw from cookie data. In traditional stores this is generally much harder – hence the ubiquitous loyalty programmes in today's retail sector.

Once identified, potential differentiation criteria then need to be prioritised by factors such as feasibility. It is often possible to identify all sorts of creative correlations and ideas for use cases, but many fail because there is no way of actually applying them within your business model.

Another approach many companies take is to carry out statistical analysis of price differentiation criteria in order to identify which aspects of the data have the strongest correlation with prices. This is undoubtedly the more scientific approach, and many clients apply it very successfully. But as well as failing to consider the customer's perspective, it can also leave pricing managers for a particular product unable to give a convincing reason for a price change. In a purely online setting, customers are unlikely to call and ask why the price has changed, but this is likely to occur in offline channels, and giving the right response will be crucial for gaining customer acceptance.

Having gone through the ideation and validation phases, we have typically narrowed things down to just a few relevant differentiation criteria, which customers are likely to understand and accept. At this stage, several follow-up questions typically arise: How big can price differentiation be? How frequently can we change prices, and what will the impact be on our business? Again, these questions can only be answered on a case-by-case basis. But the general idea is to develop a pragmatic, low-cost/low-risk setup, in which you can actually test dynamic pricing – because this is the best way to evaluate the effects on your business.

Additionally, companies need to consider how dynamic price information is communicated to the customers. The factors of behavioural economics mentioned above (framing, fairness, etc.) have a huge impact on the acceptance of the dynamic price. They can break a pricing strategy that is otherwise well-founded in the technical and economic aspects. Therefore, the psychology of customers needs to be regarded as well.

We have compiled a list of 30 relevant questions along the seven dimensions of our pricing framework to help guide you through all the questions you might have about implementing your dynamic pricing model.

Seven dimensions of PwC's pricing framework

Pricing strategy	Price setting	Pricing performance	Pricing process	Pricing organisation	Enabling technologies	Skills enablement

Conclusion

We are witnessing an increasing spread of dynamic pricing into different industries, with online-based businesses far ahead of traditional ones. Dynamic pricing is also gaining broader customer acceptance, provided that the discussed criteria are fulfilled. Every company engaging in this endeavour is faced with many questions, which have an ethical aspect, both in detail and when viewed as a whole. Because of this, clearly defined positioning and a set of guiding principles should be key elements of every company's dynamic pricing strategy.

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About us
Our clients face diverse challenges, strive to put new ideas into practice and seek expert advice. They turn to us for comprehensive support and practical solutions that deliver maximum value. Whether for a global player, a family business or a public institution, we leverage all of our assets: experience, industry knowledge, high standards of quality, commitment to innovation and the resources of our expert network in 157 countries. Building a trusting and cooperative relationship with our clients is particularly important to us – the better we know and understand our clients' needs, the more effectively we can support them.

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