Pricing in a VUCA World

- How to Optimize Prices, if the Economic, Social and Legal Framework Changes Rapidly

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Abstract

Typically, three parameters (cost, competitors and customers) are seen as pivotal, when determining the optimal price for a product. While a focus on production cost perspective leads to a cost-plus pricing and a focus on competition leads to a price matching, a value-based pricing is derived from the customer perspective.

In a world characterized by uncertainties and rapid structural changes, these landmarks only have a limited value. It is an illusion and rather naïve to assume the maximum willingness to pay for individual decision makers is robust and remains unchanged over a long period of time. In addition, modern IT-systems allow a fast reaction of the competition on individual pricing-decisions taken by a company. Against this background, the author recommends, when deriving the value-based pricing from the customer perspective, to use an extended holistic approach. This "pricing-in-3-D" approach takes into account different decision criteria: (1) the customers' willingness to pay for the product or service, (2) psychological factors influencing the customer decision and (3) impact of price decisions on the long-term customer relationship.

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1. Relevance to determine the optimal price level

Setting the right price and creating a price structure that attracts target customers are some of the most important decisions in marketing. If companies do not meet the optimal price point, for example because the price elasticity of demand is not estimated correctly, this has a strong and immediate impact on sales and profits. Here, decision-making is more complex than it seems on the first glance, since different aspects have to be considered within the decision process.

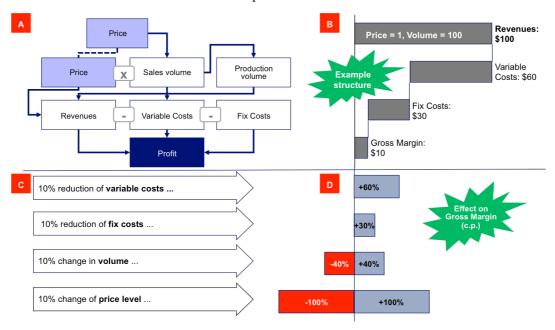


Figure 1 - Impact of price on sales, revenues, costs and profits

To understand this complexity, in the first step, a simple model for cause-effect relationships between the price on the one hand and parameters as sales, gross margin and profit on the other hand is presented. The price initially acts as a direct factor influencing sales. In addition, the price does this also indirectly, since the sales volume in turn determines the production volume and the cost pool. If it is assumed in the example that the sales volume is 100 units (the price is equal to \$1, the revenues amount to \$100), the variable cost is \$60 and the fixed costs \$30, then this results in an operating profit of \$10. Based on this sample numbers can be shown, how sensitive a 10% change in these parameters is (see Figure 1). While a 10% reduction in variable costs leads to a profit increase of 60% (c.p.), a 10 % variation of the price leads to 100% profit impact. Hence, price is the strongest profit driver. For typical large U.S. corporations it was estimated that a price increase of 1%, ceteris paribus, will boost net income by about 12% (*Gourville and Soman 2002*).

However, this model includes strong simplifications, which can already be the basis for misunderstandings. This will be resumed later, and it is here only generally stated that price, as one part in the marketing toolbox, includes significant advantages over approaches to reduce costs. Pricing decisions can be made quickly in principle, while usually no major investment is required. Consequently, actions are shown relatively quickly. In contrast, cost reduction programs in general require larger investments and have a lead-time. This perspective reinforces once again the interest of the management in pricing actions as they promise - especially in times of revenue and margin erosion problems - a "quick success".

2. Conventional framework for the price setting

Typically, the three parameters cost, competitors and customers are seen as pivotal (see Figure 2) when determining the "right price":

(1) Internal view – the own company

On the one hand, the costs of production have at least to be covered. From an economic standpoint, the price must be well above the cost of production per unit, in order to allow companies to make a profit and thus secure their existence. Hence, pricing based on a cost-plus-approach seems to be reasonable.

However, if the other two dimensions (competitors, customers) are left aside for pricing, the cost-plus pricing is suboptimal. This can be shown by a simple example: A company aims to sell 100,000 units of a product. The production costs are \$500,000, thus resulting in costs of \$ 5 per unit. The target margin is 20%. Therefore, the company determines the selling price at a level of \$6. At this point two scenarios should be considered: (a) The willingness to pay amounts up to in average \$10 in the market and the competitors charge for similar products in average \$9. In this case, the company will sell the targeted 100,000 units and realize the aimed contribution margin (100,000 units * \$1). Thus, the business goals are achieved, however, the profit could be much higher. (b) Assuming that the willingness to pay is significantly lower than in (a) and amounts to a maximum of \$6. At the same time there is a high competitive intensity, so that the competitor price will be about \$6 or less. In this case, it is likely, that the sales target of 100,000 units is not fully achieved. Will the profit target remain unchanged, the cost-plus pricing means, that the costs are spread over a smaller sales volume (for example 80,000 units). Consequently, the costs per unit increase from \$5 to \$6.25. With a non-adjusted margin of 20% a retail price of \$7.50 will be the result, a price that will probably not be accepted in the market anymore. As can easily be seen, determining the price level by applying the cost-plus approach has advantages on the one hand, but as well includes the risk to lose competitiveness by a non-market-conform pricing.

Therefore, in the pricing literature cost-plus pricing is often described as weak. Nevertheless it plays an essential role in setting the floor for a company's pricing options. An accurate analysis of costs per unit, plus a margin representing a minimally acceptable return on investment, reveals a new product's lowest reasonable price level. If the market can't bear it, the company must rethink the product's viability.

Although the cost-plus model is well known, companies often trip up in three areas when they use it to analyze their costs. First, surprisingly, they don't account for all costs that should be allocated to products. Second, overly optimistic market projections can create false estimates of costs, particularly fixed ones. (*Marn, Roegner and Zawada 2003*). Third, companies have sometimes difficulties in the separation of fixed and variable costs. For the sake of simplification, companies with a high proportion of fixed costs often consider marginal costs to be zero. In this case, the costs seem completely irrelevant for pricing decisions.

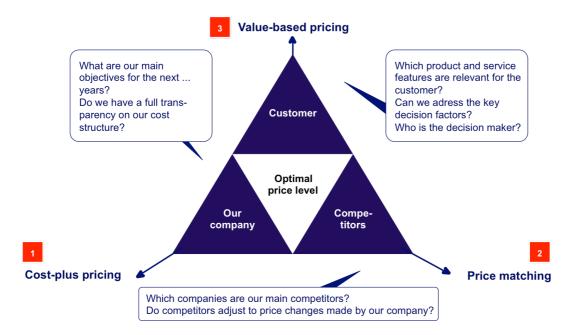


Figure 2 – Conventional framework for a pricing decision process

(2) Competitive view

Besides the cost view, offers made by the competition have a significant impact on the buying decision. Hence, it is crucial for companies to decide about their value proposition within the competitive environment. Price decisions have to be regarded as dynamic processes, including all market participants. In the event that a company decides to change price levels in the market, it can be expected that other companies are guided by these activities and also adjust their prices. Consequence of an exaggerated competitive orientation is a price matching.

(3) Customer view

The third principle, which is used in this context, is the customer perspective, i.e. the customers' preferences and willingness to pay. A key challenge is to understand what value the product creates in the perception of the customer and how much an individual customer is willing to pay at maximum for a product or service. Especially with the introduction of new products, the company must be aware of the status its new products will have. With whatever price category, it hits the market in one of three positions:

- Revolutionary: A product is so new that it creates its own market. This was certainly true for the
 market introduction of the iPhone in 2007. Quantifying and explaining such a product's benefits to
 an untested market takes skills.
- Evolutionary: Upgrades and enhancements to existing products are evolutionary in nature. But here the question arises, what customer value is generated by additional functions and extensions. In view of the above example iPhone apple must therefore assess how high the perceived incremental customer benefits between an iPhone 6 and an iPhone 5c are.
- Me-too: Painstaking cost analysis and a clear set of target customers are needed to avoid catastrophe
 with me-too products, which bring a company into line with the rest of the market without adding
 new benefits.

Too often, companies overplay the benefits of their new products, offering as revolutionary what is at best evolutionary and rarely acknowledge that they are really playing catch-up. An honest internal assessment of a product's position has to be made, since different pricing strategies are appropriate for each of the three possibilities. The measurement of customer value is possible in different ways. In addition to an assessment of the project team (internal) the involvement of customers (external) in the context of market surveys is useful. For B2C markets then this leads to other challenges than for B2B markets. Further opportunities exist in a market monitoring and competitive analysis.

Provided this information is available, the market can be segmented according to the needs of the customers and their price sensitivity. On an aggregate level different price-demand functions can be determined, which allow to ultimately form a differentiated and optimized price structure. This perspective is currently described as "Value-Based Pricing" and is recommended by the majority of the price advisors. This model works well in a robust world.

3. The influence of VUCA on pricing rules

In reality, there are often market situations that were not anticipated by management and threaten a company's existence:

- In the late 1990s, the world's three major independent producers of hard-disk drives invested about \$6.5 billion in research and development in the course of just four years. During the next decade, the bytes that can be stored per unit of a drive's surface area increased a thousand fold—while the price per unit of that surface area dropped 70 %. The three companies created enormous value for customers. Yet their failure to set prices right for their products throughout this period of significant innovation contributed to net losses totaling almost \$800 million (Baker, Marn, Zawada, 2010).
- After the North American automotive industry had generated cumulated profits of \$7 billion in1999, from 2000 onwards showed saturation effects for the number of vehicle sales. In order to protect market shares, massive discounts of approximately \$2,300 on average per vehicle were granted to car purchasers in 2001. Nevertheless, GM, Chrysler and Ford were facing a loss of market share every year. Seven years later, in 2008, the usual discounts reached about \$4,000 per vehicle, while at the same time total sales were below the year 2000 level (*Hyde 2013*).
- In 2002, the German railway introduced a new pricing system (*Krämer and Luhm 2003*). The core elements of the previous logic were almost completely changed. This concerned the systematics of special rates, the level of the standard tariff, the introduction of a revenue management system and the function of the customer loyalty card (BahnCard). The aim was to respond more strongly to the different customer needs, to provide customers with more transparency with respect to the rail fares, to attract new customers and to manage demand through price incentives while at the same time improving the utilization of the trains (*Brunotte and Krämer 2003*). In 2003, about half a year after launch, the management had to recognize that the original objectives (improve price image, additional revenue of approximately EUR 1 billion in five years and winning new customers) had not been achieved. The new pricing system had failed. While the business unit long haul transport still achieved a positive result of EUR 112 million in 2002, the company created a loss of EUR 482 million in the following year (sales and number of customers had fallen by about 10%).

These examples have clear similarities: Original expectations regarding the effects of management decisions on the perception of customers, competition, sales and profits as well as the public opinion were overtaken by reality, with fatal consequences for financial situation of the companies concerned. VUCA had met the companies with full force.

(1) Volatility: The rate of change is accelerating

Compared to the situation a decade ago, it is now acknowledged that not only more price decisions are made, but also they are made much faster. One driving factor is the rapid spread of internet use and the associated new marketing opportunities. At the same time the internet marketing allows a dynamic determination of the price and rapid price changes.

A second influencing factor is the proliferation of revenue management systems (see Cross, Higbie and Cross 2011). These were initially used almost exclusively in the airline industry, the range of applications in recent years expanded significantly. In industries, which are characterized by a high share of fixed costs, strong demand fluctuations and heterogeneous demand, the use of appropriate systems are now state of the art (rail travel, car rental, hotels, entertainment and media, advertising, etc.). Core elements of a revenue management system are a capacity management, forecasting the demand and adjustment of the rates made available. The consequence is clear: Requirements for the provision of data is growing dramatically. At the same time, the number of pricing decisions reached a level that enforces automated pricing processes as a precondition for dynamic pricing.

A further consequence is an increase in overall price transparency, which can in turn lead to stronger and faster reactions of competitors. The relevance of the internet with regard to price comparisons increased significantly (in 2012 more than 50 % of the German population with internet access used the internet often or at least sometimes to compare products and prices).

In addition, it is observed that the IT environment in today's corporations has changed. This does not only concern the rapid and consistent delivery of internal numbers, but also of customer information, if CRM data is integrated. This also explains why conditions for pricing decisions have fundamentally changed. Pricing decisions require the presence of relevant data.

But here, too, the conditions have changed. While the lack of data used to be a limiting factor for pricing decisions, today is has become obvious that more data does not automatically imply a better basis for decision. It rather depends on valid data that is not contradictory and can be clearly interpreted.

(2) Uncertainty: Unclear about the present situation and future options

A key issue managers face today is to recognize that uncertainty regarding strategic decisions can be reduced but will however leave room for interpretation at the end of the day. In this context also factors arise that the management can influence only to a small extent. In the case of the introduction of the new pricing system of the German railway (PEP) the responsible managers were well aware that the public perception of the changed pricing system constituted a critical success factor. On the one hand, the management was convinced, that the new pricing system could achieve their own goals, on the other hand, this depended on a general acceptance of the new system across different customer groups. Here again the degree of information and the type of information provided through advertising and reporting by the press played a critical role. The strong dependence of these factors was determined as part of an experiment before launch. In a basic scenario, a simple and neutral information sheet with the key features of the system was presented to potential rail passengers. As a result 45% of respondents endorsed the new price system, while 22% had a rather unfavorable view. The type of information given to the interviewees has deliberately and consciously been changed in the following:

- In the experimental group, which received as a supplement press articles with neutral to critical statements, the preference of the price system was already weakened. However, the positive image outweighed the impact of the press (*Brunotte and Krämer 2003*).
- The effect changed significantly when the press articles had a consistently critical and negative tenor. Then the acceptance values turned. This effect could be compensated if in addition to critical

press articles specific price examples were presented that were relevant to the interviewee (see Figure 3).

As it turned out, the future market situation could be mapped quite clearly by the experiment. The acceptance value in the public and by the customers fell in early 2003, after the opinion had prevailed that the new pricing system would result in consistently higher prices for the customer. The fact that by lowering the normal price on medium and longer distances tariffs for customers were partially reduced by 20 - 25%, found no consideration in the public discussion.

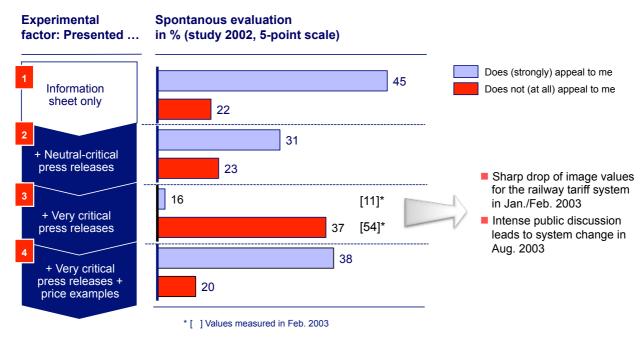


Figure 3 – Impact of different information on consumers' price evaluation

(3) Complexity: Multiplicity of Key Decision Factors

In contrast to the simplistic illustration of the effects of price on sales and profits (Figure 1), in practice more dependencies exist that make the decision making increasingly complex. For example, discussing a price change always needs to consider the reaction of the competition. Another aspect relates to the decision finding in B2B markets. This is often characterized by a buying center, which combines different functions such as purchasing, but also R&D and management. If the jobs and functions are changed frequently within a company, this makes the structures in buying centers labile at the end.

A particular challenge is the cost structure analysis. A relevant framework condition for the pricing is the time frame of the decision (short vs. medium term). This can be illustrated using the example of the liberalization of the German travel market for coaches. The market developments are not only characterized by a very strong demand growth, but at the same time by a massive expansion of the bus capacity. In the result, a price competition developed, which is threatening to the whole industry (*Krämer et al. 2014*). Assuming, that the marginal costs are equal to zero in the short term, promotes excessive discounts and accelerates the price war (*Krämer and Jung 2014*). In the medium term there are costs, which have to be covered.

(4) Ambiguity: Lack of clarity about the meaning of an event:

Another difficulty arising from the combination of factors such as (a) speed of decisions, (b) volume and inconsistency of data and (c) sense of a permanent pressure to act, is the right and quick interpretation of signals from the market. The just-discussed example of the price war can help to better understand this context: Triggers are often false or exaggerated interpretations regarding the motives and actions of the competition. Typically, a price reduction of the competitor is seen as a deliberate attack on the own company and its market share. This perception calls for an immediate response in terms of "tit for tat". In this case often a few changes in the market price adjustments lead to a life-threatening situation for the company. Mistakenly the decision makers involved are assuming a price reduction could be easily reversed without leaving arise more damage (*Rao et al. 2000*). Here, a more knowledge must pause for thought. Another finding has to pause for thought. Are managers, who see themselves involved in a price war, asked about the initiator of a price war 83 % indicate their competitor to be responsible (*SKP 2013*).

4. A extended holistic approach for value-based pricing

In a world full of uncertainties and rapid structural changes, these landmarks only have a limited value. Against this background, the author recommends the use of an expanded approach to develop an optimal pricing structure for the company. This "pricing-in-3-D" approach takes into account different decision criteria (see Figure 4):

First, the willingness to pay for the product or service has to be measured. Here, the focus must be on identifying the factors influencing the retention price. Secondly, psychological factors are included. Behavioral pricing, a relatively new research area, shows a number of examples, such as the preferences and buying decisions change if offers are assessed in different contexts. Third, the influence on the dynamics of the customer relationship must be further explored. Today, for most businesses and markets customer loyalty and customer relationship management have become key competitive factors. During the process of optimizing prices it is often assumed, that the market is composed of single transactions, while the perspective of a dynamic customer relationship with the company is missing.

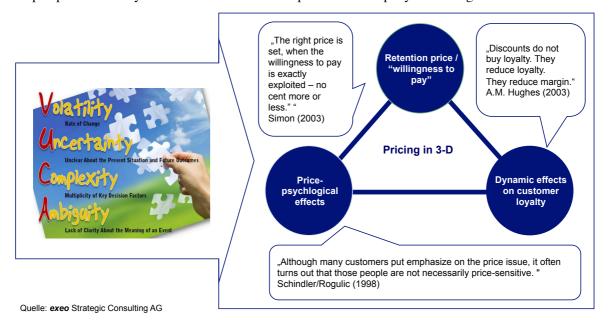


Figure 4 – The customer-oriented "Pricing-in-3-D"-approach

(1) Measuring the customers' willingness to pay

It is an illusion and rather naïve to assume that the maximum willingness to pay for individual decision makers is robust and remains unchanged over a long period of time. In addition, modern IT-systems allow a more or less immediate reaction of the competition on individual pricing-decisions taken by a company. This applies to both regional and global markets.

The variety of tools to measure the willingness to pay (WTP) of customers (see Figure 5) already provides a relatively complex and extensive picture. Basically, the different options can be structured according to whether the basis for the measurement should be firstly actual purchase data, secondly, results from the auction activities or thirdly results from assessments of customer preferences. Price-experiments and price-tests are appropriate tools for measuring the price elasticity of demand. Price changes are measured under realistic purchase conditions. Auctions gained relevance through the Internet (eBay and other online auction houses) and are recommended tools to measure the willingness to pay (*Backhaus and Brzoska 2004*). However, up to now they have not taken the lead as has been awarded to them ten years ago. It was assumed that by applying auctions in B2C markets for the first time "real" price-demand functions could be determined (*Bilstein 2000*).

For price optimization time-consuming and complex procedures such as conjoint measurement have been given special attention in the last decades. It is assumed that preferences and buying decisions can be determined more validly by an indirect query in the interview compared to a direct approach. However, this overlooks the fact that even simple and robust designs can lead to good results when determining the WTP of potential purchasers. This is also shown by recent research (*Hofstetter and Miller 2008*). The authors show that the direct measurement approach can provide a valid instrument to measure willingness to pay in the case of highly involved consumers. This finding has important implications for applied market research, since the direct measurement approach can provide a time- and cost-efficient alternative to indirect measurement approaches such as conjoint measurement, if respondents are highly involved in the underlying product.

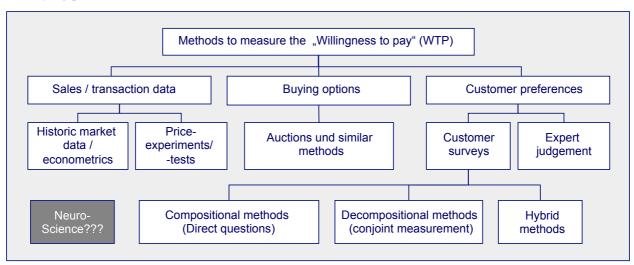


Figure 5 – Approaches to measuring the WTP

Under VUCA conditions it is recommended to exploit the tool set of existing procedures as far as possible and to rely on robust and simple methods, particularly when preferences and the willingness to pay of the decision makers in the market change faster than is typically assumed by management.

(2) Considering psychological effects when presenting offers

While conventional models for decision-making behavior of consumers and thus also for the price research and price optimization are based on a rational behavior, research in the field of behavioral economics shows, that human decision behavior is characterized by a certain degree of "irrationality". In the field of pricing research this had led to a specific research area, the so-called behavioral pricing, which has become well established. Here, in particular, the context in which decisions are taken plays a significant role.

Based on a classic experiment in relation to a subscription decision for the Economist magazine, the effects can be shown (*Ariely 2010*). Two different groups were presented a special offer. The difference in the two offers was that alternative A included two options, while the second alternative contained three options. This additional option made no sense from a rational point of view and was finally not selected. However, the existence of a third option has a strong influence on the selection ratio of the presented options. While scenario A led to an average turnover of \$80, the result for scenario B was much higher (\$114). The different results are not due to a variation of the price, but due to the changing context and its presentation (for good reasons the print-only option was described as "decoy").

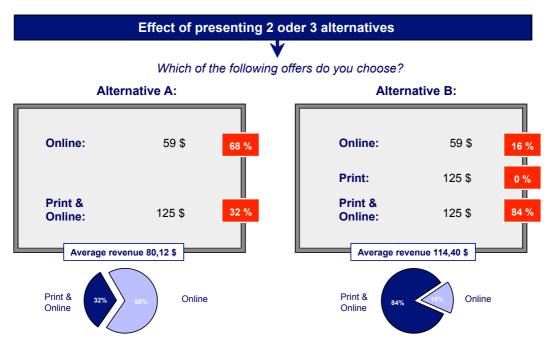


Figure 6 – Impact of the number of options on consumers' decision making

(3) Measuring dependencies between price and Customer-Lifetime-Value (CLV)

Through the consideration of the price elasticity and price of certain psychological effects a truly comprehensive (3-dimesional) analysis of price optimization is not yet complete. When optimizing the prices, companies typically determine a profit maximizing price point, provided the price-demand function and the cost function are known. It is, however, ignored that a price change (for example, a price increase) also causes effects on customer loyalty. Finally, it is conceivable that the company in a short-term profit optimization will accept a loss of customers, although in a dynamic analysis for these customers is calculated a relative high customer value.

5. The future of pricing in a VUCA world

Conventional methods of pricing and price optimization are not sufficient to ensure a value-based pricing in a VUCA environment. If managers accept this they can realize a competitive advantage. Ten recommendations can be helpful:

- (1) **Continuous segmentation:** The increasing speed of market changes requires a modified segmentation of the market in two directions: First, apply continuous customer segmentation instead of an ad-hoc approach (*Bongaerts and Krämer 2014*). Second, avoid multiple, concurrent and potentially contradictory segmentations (*Williams 2014, Kalt et al. 2013*).
- (2) **Focus of the segmentation:** Customer segmentation must be need-based (value-based) and must allow statements on the price sensitivity of customers (Trevenen 2013).
- (3) Close link of pricing with CRM: Value-Based Pricing puts the customer in the center and then determines the value drivers. Therefore, customer data from CRM systems are an essential source for decision support (*Cross, Higbie and Cross 2011*).
- (4) **Testing under real market conditions:** If possible hypotheses should first be developed to the expected price elasticity and price-demand relationships and are reviewed in the following targeted market testing and real purchasing conditions.
- (5) Using surveys to determine the "Willingness to Pay": In the event that market tests are not possible or too costly, the willingness to pay in the context of customer or market surveys can be determined. These procedures should be transparent, robust and simple.
- (6) **Applying experiments with altering price presentation and models:** As illustrated, the number of options and the context in which they are presented influence the customer's decision. The knowledge of the influence factors allows control of the demand.
- (7) **No blind faith for results of market simulation models:** Elaborate survey methods such as conjoint measurement not only provide utility values for different features and their attributes. Moreover, these can be used as input data for simulation models. Market simulation models can be helpful, as long as the users are aware of the limitations.
- (8) **Performing sensitivity tests and considering worst-case-scenarios**: Even no complex simulation models are used, the sensitive parameters can be examined based on simple analyzes.
- (9) Create organizational structures, which enable rapid decisions and its implementation. It is less important, whether the pricing competence and responsibilities are anchored centralized or decentralized within the company, but the "time to market" is crucial.
- VUCA conditions are also a chance to see a more active role in pricing. This can for example be effected by existing pricing rules which are changed or innovative pricing models which are offered. The telecommunications company E-Plus is a good example of the change from the typical price structures. In 2005, a subsidiary, BASE brought a favorable flat price model in the German market, which was later adopted by virtually all our competitors for the first time. One example of an innovative pricing is the Russian coffee house chain "dial" ("Zifferblatt") where the price is not measured by the consumption, but by the length of stay (*Krämer 2014*).

Consequence of VUCA environment is necessarily a corresponding dynamic approach to the price setting and alignment of prices. It is recommended to use the expanded "Pricing-in-3-D"-approach to develop an optimal pricing structure.

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