

New pricing models in the era of industry 4.0

Gábor Rekettye

This conceptual study would like to draw attention to the effects of industry 4.0 on the pricing policies of the disruptor companies. The study concludes that the zone of pricing decisions is growing due to the impact of Industry 4.0. The different technologies offered by the digitalization makes it possible for the disruptor companies to use new pricing methods or use the old ones differently. Pricing has become, in most cases, the core element of the new business models the disruptors have created and practised. The study points out that besides new products and technologies, even new pricing models can be the primary constituents of the disruption. The study tries to categorize and describe the most exciting new pricing policies used by disruptor companies.

Keywords: the elbowroom of pricing, categories, and characteristics of disruptive pricing methods

1. Introduction

Digitalization is the core driving force of the fourth industrial revolution. This new era will result in a paradigm shift in the production and marketing of products and services. The smarter production can make value creation easier with reducing the cost of manufacturing and producing better quality (Rüßman et al. 2015, Monostori 2015). It will enable a more customized, even personalized production. The digitalization driven paradigm shift will make it possible to personalize also the marketing tools, like pricing, distribution, communication, customer management, and customer experience.

The fourth industrial revolution is characterized by the clutter of disruptive innovations in the economy and society. When discussing the driving forces of disruptive innovations, most of the time, new products or new technologies have been mentioned. New products that offer a different, better way in satisfying the needs of customers and new technologies which make it possible for the disruptor companies to outperform with lower costs the disrupted incumbent companies.

This conceptual study would like to draw attention to the effects of industry 4.0 on the pricing policies of the disruptors. Pricing has become, in most cases, the core element of the new business models the disruptors have created and practised. It has to be emphasized that besides new products and technologies, even new pricing models can be the primary constituent of the disruption.

2. The environment of pricing in the era of digitalization

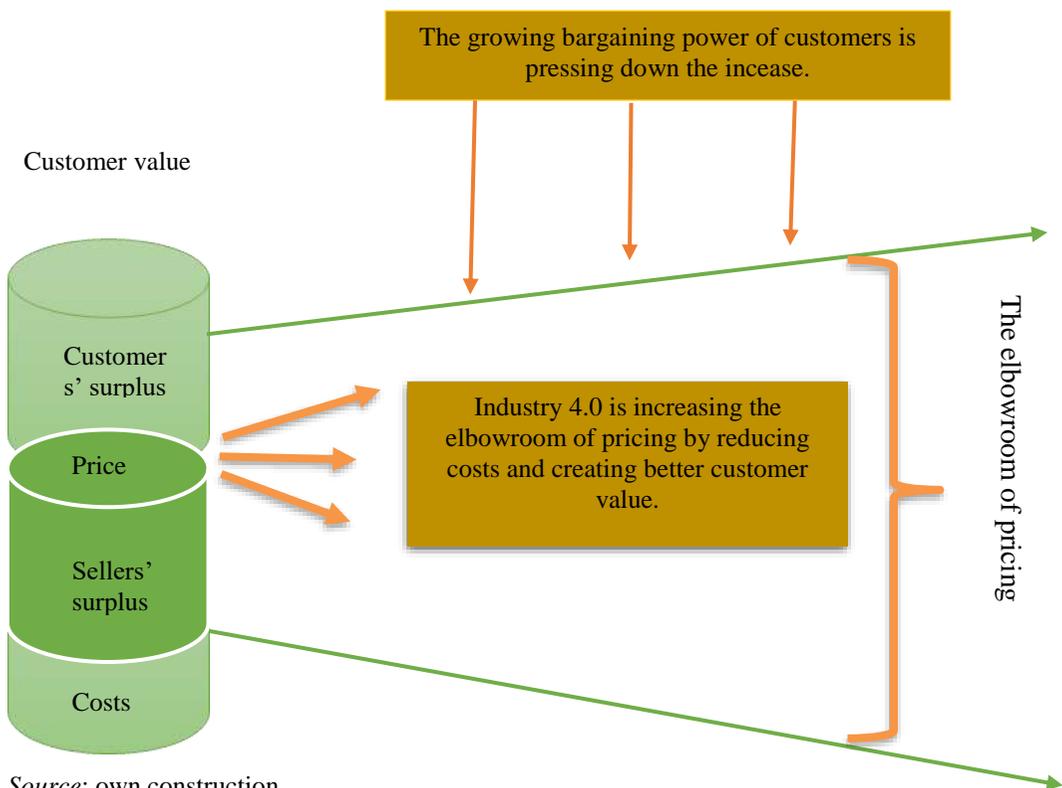
Two borders limit companies pricing decisions; the costs of products they produce and sell constitute the floor while customers' willingness to accept the price represents the ceiling of the elbowroom of pricing decision (Rekettye–Liu 2018). If the price is

set outside of these borders, the product will either produce a loss or cannot be sold in sufficient quantities. Both limits are powerfully touched by Industry 4.0.

There is a common understanding among scientists and practitioners that the Cyber-Physical Systems (CPS) of the fourth industrial revolution will result in a radical decrease in the costs of production. It means that the floor of pricing decisions is shrinking.

The effect of Industry 4.0 on the upper border is not so clear-cut. There is also an unambiguous opinion that the cyber-physical system of production will be able to manufacture products with higher customer benefits; more personalized, better quality, performance, design, more trouble-free, more convenient and safer usage, etc. (Porter–Heppelmann 2014). The first assumption is the customers will be ready to accept higher prices for better products. There is, however, a contradicting effect of digitalization in this matter: customers purchasing decisions are becoming smarter. They have an ever-growing arsenal of means to get informed and compare competing products, companies, costs, and performances. Their bargaining power is growing. This power will not let the upper border increase sharply. Despite this, it is rather safe to conclude that the scissors are opening; the zone of pricing decisions is growing (figure 1). The size of the gap is, of course, different in the various industries; its future value is difficult to judge.

Figure 1 Development of the elbowroom of pricing in the era of Industry 4.0



Source: own construction

How prices will develop in this growing zone depends on many things; among others, the following factors will influence the movement of prices:

- How will the *bargaining power of the participants* (customers, manufacturers, and intermediaries) take shape in the given industry?
- How large is the *share of the disruptor organizations* in the industry?
- What *pricing models* will disruptors use?
- With what pricing models will incumbent organizations react to defend their position on the market?
- How significant is the *state's intervention* in the given industry?

One thing is sure: the new instruments of Industry 4.0 (like advanced information technology, Big Data analytics, artificial intelligence, augmented reality, etc.) are providing, and the increasing room of pricing decisions makes it possible for disruptor innovators to create new pricing methods and technologies or use the existing ones differently. At the same time, these developments make it obligatory for the incumbent organizations to rethink their present pricing practices to defend their market positions.

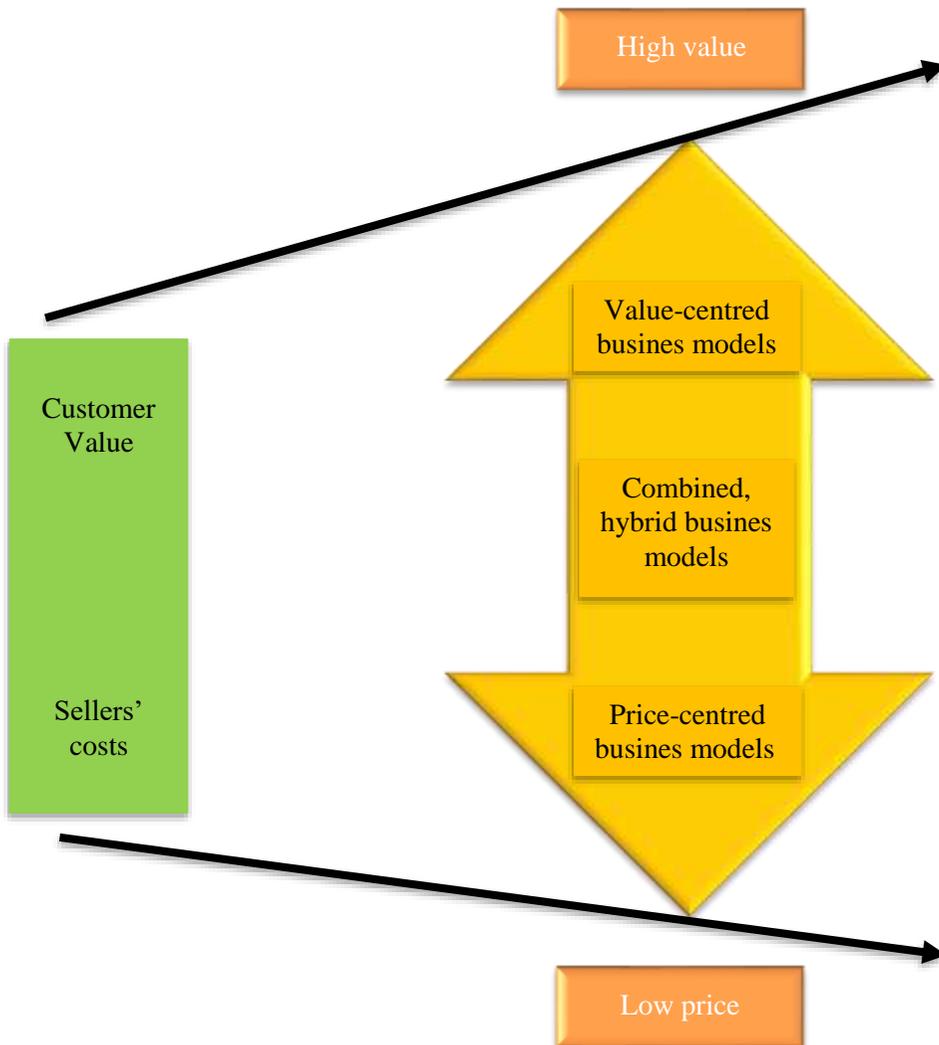
3. Categories and characteristics of the disruptive pricing models

The diverse movement of the two borders of pricing decisions offers the possibility to categorize business models using pricing policies according to their relation to these boundaries. In this sense, two groups of organizations could be differentiated:

- The first group consists of those organizations, which build their business models on the trend of shrinking costs and want to disrupt incumbent companies by low prices.
- The second group includes those companies, which are on the other end of the gap focusing on the growing customer value that is on the upper limit of pricing decisions. They try to disrupt the others by providing high customer value and customer experience. This group of companies may use premium pricing.

The reality, however, is not so cut and dry. There are many companies, which belong to the great in-between category; they want to make a competitive advantage from both ends at the same time, using very sophisticated, combined pricing strategies. It is hard to separate the disruptors' business models into clear groups; they constitute more like a continuum from the price-centred models until the high value-centred models (Figure 2).

Figure 2 The continuum of business models – from the price-centred to the value-centred



Source: own construction

The following part of the study wants to discuss the main characteristics of pricing methods used in the era of digital disruption.

4. Disruptive pricing models focusing mainly on low prices

Some of the disruptive pricing models operate at *low prices* — in extreme cases with free offerings. It was mentioned that the floor of the pricing decision is the unit costs of the offered products or services. While discussing the bottom line of the zone of pricing, a difference should be made between the long and short term. In the long run, these unit costs have to cover all the expenses of the company; in the short term, however, it is enough if they cover only the variable costs. Many services – especially the online and electronic ones – have rather low, sometimes zero, variable cost. In that case, they can set low prices, which will increase the demand for their offerings, and so even low prices will produce high profits for them.

That is the reason why disruptive businesses try to dematerialize tangible products and convert them into services. Handy examples are e-books. Let us take the Project Gutenberg (gutenberg.org): they offer over 59,000 free eBooks. Since it is a foundation, they cover their costs by raising donations. Amazon, with its Kindle, also lives from the dematerialization of books. There are other examples for dematerialization; the online webshops dematerialize the brick and mortar stores. The online programs of Universities dematerialize the classrooms and educators, the D2C (direct to consumers) webshops of manufacturers dematerialize the intermediaries, the online banking partly dematerializes the banking administrators. And, in the future, the distributed ledger with its blockchain technology will dematerialize some of the banks themselves.

4.1. Free and freemium pricing models

In the software businesses, some companies use *free-models*. Free pricing means that they offer services free, which should be otherwise paid by the users. The best examples are Google, Facebook, Twitter, Instagram, Whatsapp, etc. The free model seemingly contradicts the rule discussed at the beginning of this study: the bottom line of pricing cannot be zero since in this case, the companies costs are not covered. They can do it still since their real business is different. With free pricing, they can build a large customer base; the information about the members of this customer pool and their attention can be sold to other customers (like advertising agencies). “Google and Facebook generate 88% and 97% of their revenues respectively through advertising thanks to their ability to shape the way we use the internet” (Ghotgalkar 2017). Behind the free model, in most cases, there is cross financing.

The next model mostly used also by online businesses, is called the *freemium* model. The expression comes from the conflation of the words free and premium. In this trendy model, the basic version of the service (usually software) is offered free while the upgraded version costs money. There are plenty of examples for the freemium pricing: Spotify, Grammarly, Academia, Skype, to name some of them. The rationale behind this pricing is to get as many as possible users for the free version, who through the use of the service, become attached to it and sooner or later, some of them (usually some percents) will upgrade to the premium plan. The freemium business model is rather popular among both users and suppliers. Users prefer it since it gives the possibility to try the software free; suppliers also like it since it provides

them access to a large number of prospects with cheap acquisition costs. Therefore, when entering a competitive market, the freemium model seems to be a reliable way to get the critical mass of users.

The prices for the premium users are not high, and in most cases, the premium users pay a monthly fee, so this part of the model is belonging to the group of *subscription* models, which will be discussed later.

4.2. *Sharing economy model*

The sharing economy, or as it is also called the collaborate consumption defined by Hamari et al. (2015, p. 1) is “the peer-to-peer-based activity of obtaining, giving, or sharing the access to goods and services, coordinated through community-based online services”. Sharing economy is on the rise in the transport industry (Uber, Lyft, BlaBlaCar, Oscar, etc.) in tourism and hotel industry (Airbnb, CouchSurfing, etc.), in the financial sector (KickStarter, etc.) and other services (TaskRabbit, WeTasker, etc.) (Basselier 2018, Choe 2016).

It enables people to share goods, services, and infrastructures, which are not utilized by them totally with the help of a digital network. In these transactions, there is no change in ownership. The prices used in the sharing economy compared with those of the incumbent companies are very competitive (sometimes 30–50% lower). Besides, the Hungarian Oszkar.com (a shared transportation company) claims that it is tremendous save in resources, which foster the environment-friendly behaviour of people.

4.3. *Tiered pricing models*

The *tiered pricing*, mainly used in the software industry, shows some similarities with the freemium pricing methods. In this case, the seller usually creates three – in some cases, more – packages with different pricing tags. Mohammed (2018) calls it the GBB (Good – Better – Best) pricing. Mohammed uses the example of Allstate, an American insurance company. They discovered already in 2005 that drivers were afraid of paying premium prices in case of participating in some accidents, and the clean ones wanted to be rewarded. So, they introduced beside their Standard plan a Value plan priced 5% below Standard and introduced a Gold plan 5 to 7% above Standard (this offered immediate forgiveness and a reward deductible). This strategy proved to be a big success. This three-(or more)pronged method is prevalent in the so-called SaaS (Software as a Service) and IaaS (Infrastructure as a Service) businesses. A good example is the accounting services offered by the QuickBooks Company. It is interesting to see on their pricing page that the difference between the prices of the better and best package is much higher than the difference between the good and better (Emmer 2019).

The tiered pricing is advantageous for both providers and users. For the users, it is not a significant risk to try with the ‘good’ package, so the customer base is quickly increasing. Upgrading to the ‘better’ also seems not a very expensive move, the best, however, shows as an anchor the real value of the offering.

4.4. *The market place model*

Among the pricing models, which focus on low prices, the *market place model* has to be mentioned. Disruptor companies like eBay, iTunes, AirBnB, Uber, Trivago present danger for the incumbents by providing a digital marketplace where suppliers and customers of a given service or product can meet each other. In this marketplace, with their hard bargain, they press the prices of the service providers down. The increasing number of customers they attract with the low prices makes it possible that the amount of these companies' commission and their profit is continuously growing.

5. **Known pricing methods used in a new, disruptive way**

The free and the freemium pricing models are rather new inventions of the digital era. There are, however, many pricing methods, which are already known for many decades, and now, innovator companies use them in a new, disruptive way giving significant headaches to the incumbent organizations. Among these methods, we can list, for example, *the hypermarket model with its everyday low prices formula, the subscription model, the so-called price bundling and unbundling, the 'pay as you go' method, the yield, or revenue management, the price discrimination, etc.*

5.1. *The hypermarket model*

The *hypermarket pricing model* is used mainly by online traders. They take advantage of their market power and want to destroy their competitors by setting low, predatory prices that sometimes go even below the costs. The best example is Amazon, which was established in 1994. According to some writers, the company is selling more than five hundred million items, from clothing to foodstuffs (Jullien et al., 2019). Amazon has been so successful with this strategy, that, according to BrandZ ranking, it became the most valuable brand in 2019 with its brand value of 315 billion dollars. (<http://www.millwardbrown.com/brandz/rankings-and-reports/top-global-brands/2019>).

5.2. *The subscription model*

Subscription is a well-known pricing model used earlier mainly by newspapers and magazines. Users pay a flat fee in advance to get access to the offered service or product. Today, in this digital era, this model has become extremely popular first by online businesses, but nowadays, its use is visible also in the case of tangible products. The best example of the implementing subscription is Netflix, the market success of which is well known. The pattern of Netflix shows that a company can go at the same time for the low prices and high customer value. It has continuously evolved and improved the customer value of its offering. And could do it due to the increasing numbers of its subscribers at decreasing unit costs.

Most disruptors using the subscription pricing combine this pricing model with others. Netflix, for example, combines the subscription with tiered (GBB) pricing: it offers three plans (basic, standard, and premium) for their customers to

satisfy the different needs of them. Another combination is when, as it was mentioned earlier, freemium pricers offer their premium plans as a subscription. This combined solution could be named as *hybrid pricing*.

The most striking example of using this pricing model for tangible products is Volvo. In October 2018, Volvo introduced a nationwide program in Germany, with subscriptions to virtually all of its models – with an advertisement saying “Don’t buy this car!” (Nikola 2018). Subscription offers a better deal for customers than buying, renting, or leasing; besides, it gives a better understanding of customers driving habits to Volvo.

Other examples in the transportation industry are Flexdrive or Zipcar. In the case of Zipcar subscription means membership, this is also the case of Renttherunway clothing company. The subscribed customers can rent well-known high fashion clothing brands for free periods at a fraction of the price of a new piece of clothing. This solution, which offers advantages for clients and the company as well is disrupting retailers and traditional renting companies.

5.3. “Pay as you go” model

Paying for the product or service according to their use is not new. Roll Royce, for example, introduced it already in the 1980s with the name “Power by the Hour,” according to which customers had to pay for uptime and availability of the engines (Hagel et al. 2016). This method became disruptive now, with the digital technology that with IoT and data analytics provides an in-depth insight into how, when, and for how long-time customers use products and services. A good example is the “pay as you drive” car insurance (Progressive Snapshot). Aligning price with the use provides advantages for customers since they do not need to make substantial investments in infrastructures (IaaS) or software (SaaS), primarily if they use them infrequently. Still, it is also advantages for the sellers, since it encourages customers to try the services or products, and it ends up in an increased customer base.

Rent the Runway Company, for example, sends out several thousands of high-end fashion items every day to its network. The five million subscribers of Rent the Runway do not have to invest in a high-end fashion suit to say a graduation party, and the company is making a profit out of the approximately 30 customers who will use the same outfit for one or two days each.

5.4. Dynamic pricing — price personalization

Industry 4.0, as mentioned earlier, makes it possible to personalize products. At the beginning of the 20th century, Henry Ford produced his car the model T in one version. Today the BMW Mini has more than 14 million variations. The Big Data analytics makes it possible to get real-time information about customers’ habits, about the differences in their willingness to pay. Price setting can move on a large scale of variety, and modern means of technology like artificial intelligence can help to explore this possibility.

Price personalization is a kind of price discrimination (Krugman 2000), which has been already used for more than a century. The newness of the present price

personalization is that it is nearing to the first-degree price discrimination, which was considered by scientists earlier as a theoretical category, which cannot be executed in the real world (R. Steppe 2017).

5.5. Disruptive unbundling of products and services

Bundling is a well-known technology: it means selling products together at a price, which is lower than the sum of the costs of the components of the bundle sold individually. Unbundling is the opposite move: dividing products and services, considered earlier as one, into sellable pieces and offer to customers only that part, which they need. New entrants using unbundling may disrupt incumbent companies. For example, Craigslist unbundled classifieds from the newspaper, improving value for buyers by offering a more extensive array of free searchable content and for sellers, low-cost access to more buyers (Hagel et al. 2019).

This method is popular in the media, but it is also used in the tangible world. That is what the low-cost airlines or low-cost hotels are doing. They dematerialize parts of the service (reservation, ticketing, etc.) and offer the core service/product and the additional services separately.

Some of the unbundling technologies may lead to confusion in the customers' minds; since customers who need the complete product, meet several parts with several prices. This pricing method is also called multidimensional pricing. Many customers cannot handle multivariate numbers; they listen only to one or two elements of it. Travel agencies, in most cases, unbundle, for example, the travel costs to air travel and airport taxes and promote cheap airline costs. Those clients who decide according to the competitive airline costs may be disappointed by the additional expenses they have to pay.

6. Business models focusing on providing higher customer value

Teixeira wrote in the title of his article in the Harvard Business Review: "Disruption starts with unhappy customers, not technology" (Teixeira 2019). It means that if a disruptor company starts to deliver higher customer value can outperform incumbent companies. It is, however, not easy to define what makes customers happy. Rekettye (2019) argues that maximizing the perceived customer value needs three things: to increase attractiveness, the high quality needs satisfaction of the offer, and deliver an outstanding customer experience (CX). Offering customers more convenience, better quality, and customer care, as Bradley et al. (2015) call it high *experience value*, has been the central strategy of many disruptor companies.

All the business models and their pricing policies discussed so far besides focusing on lower prices provided at the same time high customer value. That is the reason why it is difficult to separate those models, which concentrate first on delivering high customer value. Their price position may vary: there are many models, which, while offering low prices, strive to improve the value of their offerings. Those disruptor companies which have the improvement of the customer value in the centre of their business policy may also use low or medium prices. The most successful

companies with their high-value products and outstanding customer experience can use premium rates that are accepted by their loyal customers. The best example is Apple for that business policy.

Here are some best practices used to provide high experience value for customers:

- *Personalization*: making customers feel that the offer is just for them. The clients of eSalon can, for example, personally try out their hair colouring to match their style perfectly, and the product is delivered to them directly, so they do not need to search it in the drugstores. FitBit and its applications provide personalized fitness and health information for their clients.

Mapping the decision journey. The age of digitalization has wholly changed the customers' decision journey (Court et al. 2009). The best practice companies regularly map the touchpoints of the decision journey, and they use all methods provided by modern technology to be there at all touchpoints and deliver real-time and personalized information to the prospects.

- *Removing those intermediaries* from the marketing channel, which does not add enough value to the products. D2C (Direct to Customers) is getting more and more popular, and it helps manufacturers to understand and serve their customers better.
- *Make the purchase easy, smoothly, even enjoyable*. A good example is ZipFit, which, with its app rescue men from the problem of not finding the matching size of jeans. It prepares the required brand in the necessary size for them and delivers it. IKEA makes the purchase easy for young families by providing a place for children and restaurants for families. That is why visiting IKEA on the weekend days is a pleasant excursion for young families.

6. Conclusions

The study intended to prove that pricing policies have gained in importance in the era of digitalization. In many cases, pricing has become the core element of the business models of the disruptor companies. The analysis of the pricing models used by the disruptors showed that it is not easy to categorize the pricing methods used. Most models include and use the different technologies simultaneously, making the categorization even more difficult. The groupings offered by this study are, therefore, rather vague. This fuzziness is one of the limitations of the study. The other limitation comes from the fact that this analysis was built on the results of desk research. Further direction of the investigation could be, therefore, the field research of the pricing policies used in the different industries and regions and the comparisons of their efficiencies.

References

- Basselier, R. – Langenus, G. – Walravens, L. (2018): The rise of the sharing economy. *Economic Review*, https://www.nbb.be/doc/ts/publications/economicreview/2018/ecoreviii2018_h3.pdf
- Bradley, J. – Loucks, J. – Macaulay, J. – Noronha, A. – Wade, M. (2015): *New Paths to Customer Value*. Global Center for Digital Business Transformation, An IMD and Cisco Initiative, November 2015.
- Choe, T. (2016): *The rise of the sharing economy*. Deloitte, <https://www2.deloitte.com/us/en/pages/consumer-business/articles/the-rise-of-the-sharing-economy-impact-on-the-transportation-space.html>
- Court, D., Elzinga, T. D., Knudsen, T. R. (2009): The consumer decision journey, *McKinsey Quarterly*, June 2009.
- Emmer, M. (2019): New Pricing Models for the Digital Era, *Forbes Magazine*, Jan. 22, 2019 (forbes.com)
- Ghotgalkar, V. – Baltora, F. I. – Rosenberg, M. K. – Framlington, T. R. (2017): How the digital economy is changing corporate pricing and inflation, *AXA Investment Managers – Investment Research*, 22 August 2017.
- Hagel, J. – Brown, J. S. – Wooll, M. – de Maar, A. (2019): *Unbundle products and services – Giving you just what you want, nothing more*, <https://www2.deloitte.com/us/en/insights/focus/disruptive-strategy-patterns-case-studies/disruptive-strategy-unbundling-strategy-stand-alone-products.html>
- Hagel, J. – Brown, J. S. – Wooll, M. – de Maar, A. (2016): *Align price with use*. Deloitte University Press.
- Hamari, J. – Sjöklint, M. – Ukkonen, A. (2015): The sharing economy: Why people participate in collaborative consumption. *Journal of the Association for Information Science and Technology*. Retrieved February 16, 2017, from <https://doi.org/10.1002/asi.23552>
- Jullien, B. – Reisinger, M. – and Rey, P. (2019): *Personalized Pricing and Brand Distribution*, Working Paper, Toulouse School of Economics, No TSE – 995, March 2019
- Krugman, P. (2000): Reckonings; What Price Fairness? *The New York Times*, Oct. 4, 2000, <https://www.nytimes.com/2000/10/04/opinion/reckonings-what-price-fairness.html>
- Mohammed, R. (2018): The Good-Better-Best Approach to Pricing. *Harvard Business Review*, September–October 2018, 106–115.
- Monostori, L. (2015): Cyber-physical production systems: roots from manufacturing science and technology. *Automatisierungstechnik*. ISSN: 0178–2312; 63, 10. 766–776.
- Nikola, S. (2018): Volvo’s New Pitch: ‘Don’t Buy This Car’. *Bloomberg Business Week*, 2018, Dec. 11.
- Porter, M. E. – Heppelmann, J. E. (2014): How smart, connected products are transforming competition. *Harvard Business Review*, 92, 11, 64–88.

- Rekettey, G. – Liu, J. (2018): *Pricing – The New Frontier*. Transnational Press, London.
- Rekettey, G. (2019): *Value Creation 4.0: Marketing Products in the 21st Century*. Transnational Press, London, UK.
- Rüßman, M. – Lorenz, M. – Gerbert, P. – Waldner, M. – Justus, J. – Engel, P. – Harnisch, M. (2015): *Industry 4.0*, Boston Consulting Group, April 2015. <https://www.zvw.de/media/media.72e472fb-1698-4a15-8858-344351c8902f.original.pdf>
- Steppe, R. (2017): Online price discrimination and personal data: A general data protection regulation perspective. *Computer Law and Security Review*, 33, 768–785.
- Teixeira, T. S (2019): Disruption Starts with Unhappy Customers, Not Technology. *Harvard Business Review*, June 06, 2019.