

# The dynamics of competition in zero-price digital markets

An economic and antitrust analysis of “free”

Author : **Alessandro Mazzotta**

Thesis Director : Elisabeth de Ghellinck

Thesis Reader : Massimiliano Bratti

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# 1. INTRODUCTION

In today's digital economy we are surrounded by products and services provided free of charge. While free goods, like broadcast radio, television and newspapers, have always existed, the advent of internet and the drastic decrease in the incremental costs of producing and distributing digital goods has increased their number and variety to unprecedented levels. Services like search engines, social networks, maps, dating apps, messaging, video and music streaming, digital storage and many others are now part of our everyday life.

Many are the benefits that consumers receive from such services: from money saving to multi-homing, from the opportunity to rapidly search and compare products and prices to the possibility to try a service before opting for a paid premium version, and others. However, zero-price digital markets often exhibit a high degree of concentration. Several antitrust cases, like Google's abuses of dominant position, and high profile mergers, like the acquisition of WhatsApp by Facebook, have posed the lens of competition law on free digital goods, questioning about their effects on competition and welfare.

Many argue that free digital goods are not truly free, attention to advertisements and personal data would in fact be the currencies paid by consumers in exchange for them. While this analogy is debated in the literature, data acquisition and advertisement represent two of the main reasons for the supply of free goods. Online companies compete for attracting consumers' attention, that is sold to advertisers, and for their personal information, that is used to improve the quality of services and to target users with behavioural ads. Another motivation for the supply of free goods consists in developing a large consumer base, this allows firms to make revenues by increasing the demand for complementary products supplied at positive prices or by offering a paid premium version of the services.

In this scenario, the following research questions arise: how the nature of the competitive game is affected by the condition of prices equal to zero? Which are the dynamics of competition and on which levels do firms actually compete? Can consumers be harmed in the absence of positive prices? And eventually, is the traditional antitrust analysis framework, with its price-centred tools, able to assess such issues? To answer these questions, I relied on the study of different sources: academic articles from economics, business and law, reports from organizations and authorities, legal cases and documents, online articles.

The work is organized as follows. Part 2 sets the basis for the discussion. After describing the economic transformations that allowed the widespread presence of "free" in today's digital economy, I present the main business models and strategies that characterize zero-price markets. Understanding the structure of such markets and the economic motivations behind the supply of free goods represents a necessary first step in order

to make a proper analysis of the dynamics of competition. The psychological effects of free on consumer's behaviour is also assessed. Study from behavioural economics suggest that zero is not a price like any other, it presents some particular effects on consumer's demand that are not fully explained by traditional neoclassical economics and that need to be considered when analysing firms' pricing decisions.

As noted above, from the discussion it turns out that online firms active in zero-price markets mainly compete for consumers' attention and personal information. In part 3 I analyse the dynamics of competition on these two levels and the related competition policy issues. Specifically, the analysis focuses on the nature of barriers to entry and expansion in data-driven markets and in markets for attention, the sources of creation and possible abuse of market power, the effects of concentration on competition and consumers, the non-monetary ways in which consumers can be harmed. The competitiveness of zero-price digital markets is assessed by observing how these systematically deviate from the assumptions of the perfectly competitive paradigm. While many of these markets present features that facilitate competition "for the market" rather than "in the market", entry barriers, network effects, switching costs and consumers' behavioural biases tend to limit the level of contestability.

After having analysed the dynamics and the characteristic features of this competitive landscape, in part 4 the discussion turns on more practical issues. The framework of the traditional antitrust analysis is applied in the context of zero-price markets, relying on case studies and hypothetical situations. In the absence of positive prices, particular difficulty is found in defining the relevant market, due to the inoperability of the widely used SSNIP test. The assessment of market power needs to account for the competitive constraints coming from the economic activities related to the free products. Exploitative and exclusionary abuses, together with mergers, are also analysed. The discussion suggests that the traditional antitrust tools, if sufficient attention is posed in the analysis, should be capable of assessing issues in zero-price markets but, on a case by case basis, need to be adapted and reinterpreted, considering new theories of harm that go beyond what is more easily measurable, prices.

## 2. THE ECONOMICS OF FREE

In this part of the thesis I describe the main characteristics of the economics of “free”. It represents the necessary starting point that will provide the basis for the analysis, developed in part 3, of the dynamics of competition and of the mechanisms that characterise zero-price digital markets.

In section 2.1 are outlined the economic transformations that identified the advent of the digital economy and, with it, of the “21<sup>st</sup> century free”. The drastic reduction in the costs producing and distributing digital goods has set the basis for the widespread presence of “free” in today’s economy. In section 2.2 are analysed the main business models that characterize zero-price digital markets and that allow firms to profitably supply free goods. In section 2.3 the analysis focuses on the consumer’s perspective, specifically on the psychological power of “free”. Studies of behavioural economics suggest that “zero” is not a price like any other, it presents particular features that are not fully explained by the traditional neoclassical economic analysis. This will help in understanding the pricing decisions of firms and the behavioural biases exhibited by consumers.

### 2.1 FREE ECONOMICS: ZERO AS THE DEFAULT-PRICE FOR THE NEW ECONOMY

*“It’s free and always will be!” (Facebook’s homepage)*

In today’s economy we are surrounded by products and services provided free of charge: search engines, social networks, content streaming, maps, dating apps, videogames, news, storage services and many more. While the phenomenon of free products is not new, the era of internet has revolutionized the concept of “free” and dramatically increased the number of free goods available to consumers: “free” and “the appearance of free” have become part of our ecosystem.<sup>1</sup>

#### 2.1.1 20<sup>th</sup> Century free vs. 21<sup>st</sup> Century free

Anderson, in his book “Free: the future of a radical price”<sup>2</sup>, describes the phenomenon of free in the digital economy and depicts the history of free across centuries and its evolution. A crucial point underlined in his work is that “twenty-first-century free is

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<sup>1</sup>Gal, M. S. & Rubinfeld, D. (2016), “The Hidden Costs of Free Goods: Implications for Antitrust Enforcement”, *Antitrust Law Journal*, vol.80, p. 521.

<sup>2</sup> Anderson, C. (2009), “FREE: the future of a radical price”, Hyperion, (U.S.).

different from twentieth-century free”<sup>3</sup>, due to a transition from an atoms’ economy to a bits’ economy and to the related reduction in the incremental cost of providing certain goods. Essentially his thesis sustains that, while in the atoms’ economy free most of the time “isn’t really free” and you would pay in some way or another, in today’s digital economy free means that consumers can really get something in exchange of nothing.

To introduce the twentieth-century Free, Anderson uses the example of Gillette<sup>4</sup>, to which is attributed the famous “razor and blade” business model: giving away the razors, useless by themselves, to create demand for the blades and make profits from them so that, as said before, consumers would pay in one way or another. The same works for “buy one get one for free”, which is another way to call a 50% discount, a “free gift inside” when the price of it is included in the price of the main product and a “free shipping” when the shipping’s price is translated into a higher mark-up.<sup>5</sup> The concept is well represented by the slogan “there ain’t such a thing as a free lunch” (TANSTAAFL), meaning that when the meal is free, the consumer will pay for it through a supra-charged drink.

What has changed in the 21<sup>st</sup> century is that free is not a marketing strategy, “a gimmick, a trick to shift money from one pocket to another”<sup>6</sup> but the default price for the digital economy, built on bits rather than atoms. “In the atoms’ economy things tend to get more expensive over time. But in the bits’ economy things get cheaper. The atoms economy is inflationary, while the bits economy is deflationary.”<sup>7</sup> Following the Moore’s law, for which semiconductor chips double the number of transistors they can hold every eighteen months, the cost of processing, digital storage and bandwidth, the pillars of the digital economy, have fallen faster and for longer time than any other primary input in history, becoming “too cheap to meter” and so “too cheap to matter”. In other words, the marginal costs of providing digital goods have fallen to zero or near zero, giving raise to what Anderson calls “Freeconomics”: following the Bertrand’s scheme, according to which in competitive markets price falls to the marginal cost, the price for digital goods became zero.

This creates what the book depicts as an “era of abundance” and since standard economics takes as central principle the scarcity of resources, “Freeconomics” is different from it. Ideas are at the hearth of this abundance, because they propagate at a zero marginal cost<sup>8</sup>. For Anderson, the more products are made of ideas rather than stuff, the faster they get cheaper, a mechanism that leads to free in the digital economy.

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<sup>3</sup> Anderson, C. (2009).

<sup>4</sup> Anderson, C. (2009), p.11.

<sup>5</sup> Anderson, C. (2009), p.14.

<sup>6</sup> Anderson, C. (2009), p.12.

<sup>7</sup> Anderson, C. (2009), p.12.

<sup>8</sup> Anderson, C. (2009), p.67.

### 2.1.2 The “illusion” of free

The work of Anderson is criticized by Newman<sup>9</sup>, who defines free as a “myth” to be debunked and Freeconomics as an “illusion”. Newman analyses Freeconomics as a syllogism with a major premise, a minor premise and a conclusion which he retains all wrongs. The first is the “zero-cost premise”, according to which internet and the digital world have caused the marginal cost of many products to fall to zero, or close to zero. The second is the “marginalist premise”, that determines that the market forces have led the price down to the marginal cost. The third is the “zero-price conclusion”, that follows from the previous two.

Newman states that “marginal costs are persistent”. Even if the costs of processing, storage, and bandwidth will continue to be reduced, they will never reach zero<sup>10</sup>. The major premise is therefore incorrect because for a for-profit firm close to zero is not zero and so not “too cheap to matter”. The marginalist premise is instead built on the false assumption that digital markets are perfectly competitive. Perfect competition is an economic theoretical idealization, hardly realized in the real world, which serves as a benchmark. It is based on a series of strong assumptions (perfect information, homogeneous products, no entry barriers and large number of buyers and sellers) which, for Newman, are not satisfied by digital markets.

Following the false premises, the conclusion of zero-price is wrong, except for those services supplied by non-profit organization or for “open-source software”. Since for-profit firms still face real, and often substantial, costs, these must be recouped. They do so by taking something from consumers in exchange of the free products, something from which they can extract value: personal information and attention to advertisements. “Instead of paying with fiat currency, consumers pay with their attention or information. And where consumers pay, no matter the medium of exchange, free is not free”<sup>11</sup>.

Customer attention and personal information have become important intangible assets in the digital economy, allowing exchanges in which information serves as a currency for services otherwise perceived as free<sup>12</sup> and providing the ingredients for profitable services such targeted ads.

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<sup>9</sup> Newman, J. (2018), “The myth of free”, *George Washington Law Review*, Vol. 86.

<sup>10</sup>Newman, J. (2018), p.16.

<sup>11</sup> Newman, J. (2018), p.34.

<sup>12</sup> Gal, M. S. & Rubinfeld, D. (2016), p.2.

## 2.2 WHY DO FIRMS SUPPLY FREE GOODS? BUSINESS MODELS AND STRATEGIES

To make a proper economic and competition analysis of zero-price markets it is crucial to understand how these are structured. The analysis must begin by focusing on understanding the economic reasons that lead firms to provide services and goods at no charge. It is logical that, to profitably supply goods at a price equal to zero in the long run, firms must make profits in some way not involving the free product but, of course, related to it.<sup>13</sup> A distinction has to be made between sustainable and non-sustainable strategies.

### 2.2.1 Sustainable strategies

Sustainable strategies are those business models that allow for-profit firm to profitably supply free good. The most common strategies involve the use of complementary products and tying, multi-sided platforms and “freemium” models. Common to all those models is the use of cross-subsidies<sup>14</sup> through interrelated products or markets.

#### Complementary products

Two products are complementary if the decrease in the price of one product increases the demand, and so the price, of the other, as in the case of the “razor and blade” business model. Some firms offering free products supply at the same time complementary goods at positive prices.

Complementary products can be tied or non-tied<sup>15</sup>. The tie can be of contractual or technological nature. In the case of contractual tying, the sale of a product (the tying product) is made conditional on the sale of another (the tied product). Tying is used as a form of price discrimination that enables to earn greater profits from users who exhibit greater demand for the tied product<sup>16</sup>. When the tying is technological, one product is designed in such a way that it functions only when used in conjunction with its own complementary products<sup>17</sup>.

Other strategies involving complementary products do not entail tying. As noted by Evans (2011), “for the free complementary good strategy to work in practice, the seller must have some market power over the customer during her purchasing decisions for

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<sup>13</sup> Newman, J. (2015), “Antitrust in Zero-Price Markets: Foundations”, *University of Pennsylvania Law Review*, vol. 164, 149-206, p.154.

<sup>14</sup> Cross subsidization: A strategy where support for a product comes from the profits generated by another product. Cross-subsidies are common to many markets, not only those involving zero-price products.

<sup>15</sup> Newman, J. (2015), p.155.

<sup>16</sup> Newman, J. (2015), p.155.

<sup>17</sup> Gaynor, D. E. (2006), “Technological tying”, Federal Trade Commission, Working paper no.284.

the not free product". A price equal to zero is just a special case of a widely diffused strategy, generally suppliers just apply a low price to one of the complementary products.<sup>18</sup> It is the case, for example, of movie theatres, who get most of the profits not through tickets but with snacks and drinks, and of low-cost airlines, who are able to sell cheap flight tickets making profits on other services that the client may buy.

Examples of complementary products strategies used in digital markets are represented by two cases involving Microsoft, who tied its Windows operating system to its Internet Explorer web browser<sup>19</sup> and, similarly, to its software Windows Media Player<sup>20</sup>. Another case involved Google, who was accused to violate antitrust law by bundling its applications to its Android free mobile operating system<sup>21</sup>.

### Two-sided markets

The most common business model involving zero-price products is the two-sided platform model. Two-sided markets are characterized by the presence of two different groups of consumers who interact with each other via a platform, which, in exchange of a fee, performs the task of connecting the groups. At least one of the groups of consumers values the presence of the other. The profit maximizing prices for each of the groups are determined by the demand on each side, the level of interdependence between the groups and the marginal costs of providing the products or services. These characteristics make possible in some cases that, to "get both sides on board"<sup>22</sup> in order to extract maximum profits, the price for one of the groups is zero<sup>23</sup>.

There are some similarities with the case of complementary products but here the complementarity is created by the interaction between the groups. The complementary product for members of one group of consumers is the members of the other group of consumers<sup>24</sup> and, as noted by Rochet and Tirole in their seminal work, the corresponding externalities are not internalized by end users (the same individual who buy both the razor and the blades)<sup>25</sup>.

It is important to notice that many of the two-sided platform markets exhibit strong network externalities on, at least, one of the sides<sup>26</sup>. Network externalities determines that "the utility that a user derives from consumption of the good increases with the number of other agents consuming the good"<sup>27</sup>. This gives strong incentives to enlarge

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<sup>18</sup> Evans, D. S. (2011), "The Antitrust Economics of Free", *Competition Policy International*, Spring 2011, p.7.

<sup>19</sup> United States v. Microsoft Corp., 147 F.3d 935, 940 (D.C. Cir. 1998).

<sup>20</sup> Commission Decision of 24.03.2004 relating to a proceeding under Article 82 of the EC Treaty.

<sup>21</sup> Class Action Complaint, Feitelson v. Google Inc., No. 5:14-cv-02007 (N.D. Cal. filed May 1, 2014).

<sup>22</sup> Rochet, J. C. & Tirole, J. (2003), "Platform Competition in Two-Sided Markets", *Journal of the European Economic Association*, 1 (4), 990-1029, p.1113.

<sup>23</sup> Evans, D. S. (2011), p.8.

<sup>24</sup> Evans, D. S. (2011), p.8.

<sup>25</sup> Rochet, J. C. & Tirole, J. (2003), p.991.

<sup>26</sup> Rochet, J. C. & Tirole, J. (2003).

<sup>27</sup> Katz, M. L, Shapiro, C. (1985) "Network Externalities, Competition and Compatibility", *The American Economic Review*, 75(3), p. 424.

as much as possible the consumer base connected to the platform, keeping prices very low or equal to zero.

Two-sided platforms represent the traditional media model and newspapers offer a clear example of how they work: the publisher offer to readers its product free of charge or at a very low price and extract profits from the advertisers, who pay to interact with end users. The price paid by the readers, most of the time, doesn't cover the actual costs associated with creating, printing and distributing the newspaper. The publisher, in practice, "doesn't sell newspapers to readers but readers to advertisers"<sup>28</sup>. Broadcast television and radio work following the same scheme.

The web can be seen as an extension of the media model. Facebook, Instagram and other social media platforms provide their services to consumers at a price of zero and sell targeted ads based on consumers' revealed preferences at prices which potentially cover their costs of providing free Internet services.<sup>29</sup> Google, together with hundreds of other services, offers its powerful search engine for free and makes most of its profits on advertisement. These are just few representative examples of the ad-supported web ecosystem. Even in these cases "there is not such a thing as a free lunch": consumers might ultimately pay indirectly through higher prices for products including the marketing expenses. The same reasoning is applied to markets not involving media products such as credit cards which might be free for card holders, while substantial fees are paid by merchants.

### Freemium

The term Freemium, composed by the words *free* and *premium*, was coined by the venture capitalist Fred Wilson in 2006 and represents now a very popular business model in digital markets. It consists in providing a basic version of a product or service free of charge in order to develop a large base of users, with the hope of persuading a sufficient portion of them to pay for a more advanced version. This strategy can be profitable because the marginal cost of providing the basic version is normally negligible in the case of mobile applications, software and online services. Industry data indicates that 98% of Google's Play Store revenue and 95% of Apple's App Store revenue come from freemium applications.<sup>30</sup>

The principle of the freemium business model is that there is one of the two groups of consumers, the paying consumers, who is willing to pay more for a more advanced version and who subsidises the other group, the non-paying users. Free users can later become paying customers and vice versa, with a conversion rate that is somewhere in between 2-5%<sup>31</sup>.

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<sup>28</sup> Anderson, C. (2009), p.19.

<sup>29</sup> Gal, M. S. & Rubinfeld, D. (2016).

<sup>30</sup> Holm, A. B. & Günzel-Jensen, F. (2017) "Succeeding with freemium: strategies for implementation", *Journal of Business Strategy*, Vol. 38 Issue: 2, 16-24, p.17.

<sup>31</sup> Holm, A. B. & Günzel-Jensen, F. (2017), p.21.

An interesting point made by Holm and Günzel-Jensen (2017) is that free users can be very valuable for attracting venture capital. The larger the number of active product users, the higher the valuation of the company and hence its attractiveness for the market and investors.<sup>32</sup>

There are several famous examples of digital companies who embraced this strategy: the music streaming service Spotify, the professional network platform LinkedIn, the widely used dating app Tinder. It is also popular in the industry of online newspapers, where publishers offer basic contents for free but charge a price or a subscription to all those who want to read the full publication or special contents. A good illustration of a freemium model is the one adopted by Adobe for its product Adobe reader. The basic Adobe reader is distributed for free, thereby increasing the demand for software that writes Adobe files. The enhanced version of the Adobe software (that allow readers, for example, to highlight or comment on certain passages), is not free.<sup>33</sup>

### Two-staged strategies

As noted by Gal & Rubinfeld (2016), once consumer base, product reputation and its network effects are enlarged thanks to a first stage involving a price of zero, the company can choose another way than opting for a premium paid version. In the second stage profits can come from “the price paid by another firm for buying the firm's property rights in the products”. The “free” first stage serves in these cases as prove to potential buyers of the validity and the potential demand for their products<sup>34</sup>. Examples are the acquisitions of WhatsApp by Facebook in 2014 and of Waze by Google in 2013. Waze is an application who, using information from its users, is able to notify traffic congestions in real-time. The first real profit of Waze came from its acquisition by Google, which wanted to improve its on-line navigation systems<sup>35</sup>.

### 2.2.2 Non-sustainable strategies

Non-sustainable strategies are those strategies that for-profit firms cannot depend on for long-run profitability.<sup>36</sup> These entail the provision of services which are offered not with the objective of making profits but for motivations that are intrinsic and not purely economic<sup>37</sup>. It is the case of Free and Open Source software, the most famous of these being Linux operating system which is free and maintained by a large community of volunteers. In other cases, non-sustainable strategies are implemented by non-profit organizations which are able to recoup the cost of providing a free service through users’

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<sup>32</sup> Holm, A. B. & Günzel-Jensen, F. (2017), p.21.

<sup>33</sup> Evans, D. S. (2011), p.10.

<sup>34</sup> Gal, M. S. & Rubinfeld, D. (2016), p.17.

<sup>35</sup> Cohan, P. (2013, June 11), “Four Reasons Google Bought Waze”, retrieved from <https://www.forbes.com/sites/petercohan/2013/06/11/four-reasons-for-google-to-buy-waze/#19e36aa1726f>

<sup>36</sup> Newman, J. (2015), p.157.

<sup>37</sup> Gal, M. S. & Rubinfeld, D. (2016), p.8.

donations. The most classic example is Wikimedia Foundation which owns the very popular online encyclopedia Wikipedia.

In the case of for-profit firms, a non-sustainable strategy must be temporary and followed by phases of positive prices. This follows the scheme of a predatory price strategy, with a first period of incurred losses, with the objective to attract consumers and becoming competitive, followed by a recoument period.

## 2.3 BEHAVIOURAL CONSIDERATIONS: THE ZERO-PRICE EFFECT

Behavioural studies can help in understanding which are the psychological effects of the zero-price. More specifically, if we should consider zero a price like any other or a special price with particular characteristics and effects on consumers that are not fully explained by traditional economic analysis. Behavioural economics is the field of study that applies psychological insights into human behaviour. It explains how individual choices systematically deviate from what neoclassical rational-choice theory, would predict. The latter is based on the assumptions of perfectly rational, utility maximizing, narrowly self-interested individuals. Consumption decisions are made by rational consumers on the basis of a cost-benefit evaluation. Following this scheme, a purchase is made when the consumer's assessment suggests that the benefits associated with buying a certain good exceeds its costs.

Experimental studies regarding the purchasing behaviour related to zero-price products are made by Shampanier, Mazar and Ariely (2007)<sup>38</sup>. Their intuition is that consumption decisions in the case of zero-prices differ from those involving positive prices because "people do not simply subtract costs from benefits but instead they perceive the benefits associated with free products as higher"<sup>39</sup>. This phenomenon is called "zero-price effect".

Shampanier and her colleagues run a series of similar experiments to test their hypothesis. One of them involved chocolate. Participants were asked to make a purchasing decision between a top-quality branded chocolate and a low quality one, giving them the possibility of buying nothing. The branded chocolate was priced at 27 cents, a fraction of its actual wholesale price, while the low-quality chocolate was priced at 2 cents. During this first stage, considering the differences in quality and their personal preferences, 40% of participants opted for the high-quality, 45% for the low-quality and 15% decided to buy nothing. The second stage involved a reduction of 1 cent for both prices so that they were respectively 26 and 1 cent each. The participants behaved rationally and the 1 cent change in price did not have significant impact in demand. 40% still opted for the high-quality, 40% for the low-quality and the remaining 20% bought nothing.

The third stage of the experiment involved the introduction of "free good", the prices were lowered by another cent so that they were respectively 25 and 0 cent. According to the standard economic model, this should not lead to any significant switch from one product to the other since prices were lowered by the same amount as before, keeping constant the cost-benefit assessment made by consumers. Participants, when facing the decision of purchasing the zero-priced product, didn't follow the "rational paradigm": 90% opted for the free low-quality chocolate and only 10% opted for the high-quality

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<sup>38</sup> Shampanier, K., Mazar, N., Ariely, D. (2007), "Zero as a Special Price: The True Value of Free Products", *Marketing Science*, 26(6), 742–757.

<sup>39</sup> Shampanier, K., Mazar, N., Ariely, D. (2007), p.742.

chocolate. The same results are obtained in other similar experiments, confirming the hypothesis that “when a product becomes free, its intrinsic value for consumers (the benefit, in cost–benefit terminology) increases”<sup>40</sup> and that consumers “overreact to the free product as if zero price meant not only a low cost of buying the product, but also its increased valuation”<sup>41</sup>. Through another experiment, the authors also demonstrate that the zero-price is more powerful in shifting demand than a five times larger price reduction that remains within the range of positive prices<sup>42</sup>.

Further studies suggested the presence of the “zero-price effect” also when the free product is bundled with positively priced goods. Nicolau and Seller<sup>43</sup> demonstrated how the presence of a “free Breakfast” raised demand for low-valued hotels. Furthermore, Spiegel, Benzion, and Shavit<sup>44</sup> showed how a “buy one get one for free” promotion results to be more powerful than an analogous 50% discount on both products.

An interesting natural experiment, confirming the psychological effect of free, was the implementation of the Amazon’s free shipping in Europe. When the company guaranteed free shipping for every purchase above 25\$ it was a success everywhere except for France. There, the shipping price was mistakenly set at a very low positive price (1 franc). When Amazon fixed this problem eliminating the shipping cost, the French consumers behaved like in all the other countries with a result of an increased demand.<sup>45</sup>

An intuitive conclusion could be to attribute the power of the “zero-price effect” to the lower “mental transaction costs” associated to the purchase of a free product. Basically, the cognitive effort that a consumer has to make in taking a decision involving a price of zero is lower than with a positive price. However, when testing for several psychological potential explanations, Shampanier et al. prove that the absence of transaction costs does not fully explain the presence of the “zero-price effect”. The strongest influence is attributed to what they call a “positive affect”<sup>46</sup>: an emotional reaction that consumers exhibit when they have the chance of getting something for free. As Ariely says “FREE! gives us such an emotional charge that we perceive what is being offered as immensely more valuable than it really is”<sup>47</sup>. This emotional reaction is due to what in cognitive psychology and behavioural economics is called “loss aversion”: the intrinsic human tendency of being afraid of making a loss, in this case losing the opportunity of making a good deal. As noted by Gal and Rubinfeld, free goods exhibit “nudge” qualities similar

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<sup>40</sup> Shampanier, K., Mazar, N., Ariely, D. (2007), p.744.

<sup>41</sup> Shampanier, K., Mazar, N., Ariely, D. (2007), p.743.

<sup>42</sup> Shampanier, K., Mazar, N., Ariely, D. (2007).

<sup>43</sup> Nicolau, J. L. (2012), “Battle Royal: Zero-price effect vs relative vs referent thinking”, *Springer Science*, 23(3), 661.

<sup>44</sup> Spiege, U. et al. (2011), “Free Product as a Complement or Substitute for a Purchased Product - Does it Matter?”, *Monetary Economy*, 2(2), 124.

<sup>45</sup> Anderson, C. (2009), p.53.

<sup>46</sup> Shampanier, K., Mazar, N., Ariely, D. (2007), p.751.

<sup>47</sup> Ariely, D. (2010), “*Predictably Irrational: The Hidden Forces That Shape Our Decisions*”, Perennial, p.54.

to those reported by behavioural economists Thaler and Sunstein, which help push consumers to make choices they otherwise might not have made<sup>48</sup>.

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<sup>48</sup> Gal, M. S. & Rubinfeld, D. (2016), p.12.

## 3. THE DYNAMICS OF COMPETITION IN ZERO-PRICE DIGITAL MARKETS

Part 3 represents the core part of the thesis. The discussion made in part 2 has defined the characteristics of the economic activities involving free digital goods and has provided all the necessary ingredients to move the analysis on the understanding of the dynamics of competition in zero-price digital markets. The aim of this part is to examine how the nature of the competitive game is affected by zero-prices and to underline which are the levels at which competition between firms occurs. These are the necessary steps in order to identify the possible sources of monetary and non-monetary consumer's harm and the role of competition law in zero-price digital markets.

In section 3.1 I present different points of view in the literature regarding the nature of "transactions" involving free digital goods. The goal is to understand if consumers are in fact giving something in exchange for free goods and, eventually, which are the media of this exchange. This will help in understanding how consumers can be exploited by anticompetitive conducts. While many identify in the attention given to advertising and in the personal information disclosed the "currencies" that consumers pay, there is no total agreement on this analogy. Nonetheless, it appears clear from the discussion that these are the main parameters of competition in zero-price digital markets. Firms compete for obtaining consumers' attention and information, these dynamics are described respectively in sections 3.2 and 3.3. In section 3.4 I use the analysis made on the markets for attention and for information to establish how zero-price digital markets systematically deviate from the assumptions of the perfectly competitive paradigm, highlighting the possible sources of competition law issues.

### 3.1 THE NATURE OF "TRANSACTIONS" INVOLVING FREE PRODUCTS

#### 3.1.1 On the applicability of Competition Law to zero-price markets

Two debated issues regard whether the activities involving free products need to be considered as economic transactions and whether competition law should be applied or not to zero-price markets, with the second depending on the first. While these seem to be matters for lawyers rather than for economists, the discussion will help in understanding if consumers are actually paying something, even if not in monetary terms, for using free products and if this exchange can be subject to possible exploitative abuses.

An argument is that, in the absence of positive monetary prices, there cannot be those kinds of welfare harms that competition law aims to prevent. Following this reasoning,

consumers do not enter in a transaction when accessing to free goods since they don't give anything in exchange for them. The absence of possible monetary overcharges excludes, for some scholars, the need for antitrust scrutiny.

Ferro (2015)<sup>49</sup> sustains that antitrust law does not apply to what he defines as “truly” gratuitous goods, those that are not related to any profitable activities such as, for example, advertisement. He affirms instead that, when subsidised by remunerated activities, gratuitous goods may raise competition concerns but only for their impact on a paid market, otherwise “we would be all too happy to see consumer welfare improved by donations from a company”<sup>50</sup>. He refuses the presence of any medium of exchange for free products so that their offer cannot be considered an economic activity constituting a “market as defined in competition law”<sup>51</sup>.

Newman (2015)<sup>52</sup>, on the contrary, sustains the thesis that consumers do indeed take part in a transaction because they give something in exchange for free goods, something that is not represented by a monetary value. To explain this reasoning, he uses the concept of “market-signaling” costs<sup>53</sup>, those costs that necessarily signal the presence of trade because used as a medium of exchange between the parties of a commercial transaction. Normally “market-signalling” costs are monetary but that's not the case for zero-price markets, where consumers incur costs that are referred as *information* and *attention* costs.

### 3.1.2 Personal information as a medium of exchange: Information costs

In May 2017 *The Economist* titled “*The world's most valuable resource is no longer oil, but data*”<sup>54</sup> in an article underlying how the digital economy demands a new approach to antitrust. In the era of big data, personal information has become an extremely valuable asset: companies are increasingly adopting business models that rely on it, offering free services in order to gather a large amount of data from consumers.

While consumer information has always been valuable for business, it is even more so for digital platforms for at least two reasons: the greater access that they can rely on, if compared to traditional businesses, and the greater ability to process and use those data<sup>55</sup>. Personal data in today's economy can be used by digital companies in many ways. As observed by Shelanski (2013), consumer information can be an input of

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<sup>49</sup> Ferro, M., S. (2015), “Ceci n'est pas un marché: Gratuité and competition law”, *Concurrences*, N° 1.

<sup>50</sup> Ferro, M., S. (2015), p.5.

<sup>51</sup> Ferro, M., S. (2015), p.5.

<sup>52</sup> Newman, J. (2015).

<sup>53</sup> Newman, J. (2015), p.163.

<sup>54</sup> The Economist (2017, May), “The world's most valuable resource is no longer oil, but data”, retrieved from <https://www.economist.com/leaders/2017/05/06/the-worlds-most-valuable-resource-is-no-longer-oil-but-data>.

<sup>55</sup> Shelanski, H., A. (2013), “Information, Innovation, and Competition Policy for the Internet”, *University of Pennsylvania Law Review*, Vol. 161, 1663-1705, p.1678.

production that firms can use in order to improve their services, ultimately increasing returns. When such information is not available to competitors, it can be a strategic asset that enables a company to maintain a certain competitive advantage from them. It can also be a valuable and tradable commodity that the company can sell to those businesses willing to pay for information about consumers' preferences and behaviour.<sup>56</sup>

Newman identifies in personal information one of the two primary media of exchange that underlie sustainable business models featuring products offered at zero prices<sup>57</sup>. Following his reasoning, information would be the cost that consumers pay in order to access free online services. Like in a traditional transaction involving a monetary payment, the consumer evaluates the benefits and costs associated with such services and, when the former exceeds the latter, he decides to release the information requested as it would normally work with a currency.

To what extent data can be really seen as the "currency of the 21st century"<sup>58</sup> is an open debate in the literature. Strandburg (2013) defines the analogy between data collection and payment as "seriously misleading"<sup>59</sup>. Since internet users do not know the "prices" that they are paying in exchange of free services, it's difficult for them to evaluate the disutility associated with the consumption. In ordinary transactions, instead, this can be easily expressed by the payment.

### 3.1.3 Attention costs

The second type of "market-signalling" costs incurred by consumers are the attention costs. In this case consumers would take part in a transaction where, instead of paying money, they literally *pay attention* to advertisement in order to get access to free product and services. Most of the businesses providing zero-price goods attract consumers to expose them to advertisements while accessing the content. Providers of services like social networks, content streaming, news and others basically sell the consumers' attention to advertisers through sophisticated targeted ads.

As I wrote in part 2, this is typically the case for multi-sided platforms and for all those ad-supported products. It is also the case for many freemium models that comprise a free version with ads, like the music streaming platform Spotify. This practice seems to confirm the thesis that paying attention to advertisement would replace paying a

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<sup>56</sup> Shelanski, H., A. (2013), p.1678.

<sup>57</sup> Newman, J. (2015), p.165.

<sup>58</sup> Zax, D. (2011, Nov), "Is Personal Data the New Currency?", retrieved from

<https://www.technologyreview.com/s/426235/is-personal-data-the-new-currency/>

<sup>59</sup> Strandburg, K., J. (2013), "Free Fall: the Online Market's Consumer Preference Disconnect", 2013 *University of Chicago Legal Forum*, 95-172, p.95.

monetary cost to access the service, since consumers can choose between these two “media of exchange”.

Advertisements come with related costs and potential benefits. The benefits would consist in the fact that they can be viewed as a mechanism for reducing search costs by providing information to consumers about the characteristics and prices of goods available from various sellers.<sup>60</sup> Other theories identify advertisement as a form of persuasion that alters consumers’ preferences and shifts demand in a sub-optimal way. The costs associated with advertisement would consist in the time consumers spend in watching or listening to it.

### 3.1.4 Competition on quality and its dimensions

While, as said before, it is an open debate if it’s right or not considering attention and personal data as “prices” paid by consumers in exchange of free services, it is widely accepted that firms in zero-price markets compete on quality.

Price represents only one dimension of competition and mergers or monopolistic practices can be sources of consumers’ harm through anticompetitive effects on quality and innovation. This can happen in any kind of market but it is particularly true when a product or service is offered for free, because quality represents the primary dimension of competition<sup>61</sup>. Stucke and Ezrachi (2015) note that the firm may have the incentive to degrade the quality level on the free side of the market to maximize profits or increase market power on the other side<sup>62</sup>. The firm’s power of degrading quality it’s determined by the level of competition and by the ability of consumers to detect changes in quality.

A report by the OECD<sup>63</sup> identifies in advertising and in privacy and data security the two most important dimensions of quality in zero-price markets.

Privacy effects on quality would be determined by: (i) the level of control that consumers have on their data with regard to what kind of information is extracted and by the level of awareness of its volumes; (ii) how the data is used by business entities and whether it is subject of trade to third parties<sup>64</sup>. Privacy represents a dimension through which firms can differentiate from competitors, like in the case of DuckDuckGo, the search engine that declares to not collect any personal information. The extent to which consumers are able to detect different levels of privacy and whether this really represents a characteristic taken into account when deciding between different services

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<sup>60</sup>Newman, J. (2015), p.170.

<sup>61</sup> Stucke, M., E. & Ezrachi, A. (2015), “When Competition Fails to Optimize Quality: A Look at Search Engine”, *Yale Journal of Law & Technology*, 70-110, p.74.

<sup>62</sup> Stucke, M., E. & Ezrachi, A. (2015), p.72.

<sup>63</sup> Organisation for Economic Co-operation and Development (2018), “Quality considerations in digital zero-price markets”.

<sup>64</sup> Organisation for Economic Co-operation and Development (2018), p.7.

or goods, remain open questions. Nonetheless “there is no group of consumers who prefer less data security, all else equal”<sup>65</sup>.

Advertising affects the quality of services considering that all consumers would like to be exposed to the minimum amount of advertisement possible and that consumers prefer being exposed to high quality advertisement.

Whether it is right to consider data and time dedicated to advertisements as “prices” paid by consumer or just as dimensions of quality, it is crucial noting that these two represent the dimensions on which firms compete when providing free services. A dedicated analysis of competition for attention and for information is made in the next sections.

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<sup>65</sup> Organisation for Economic Co-operation and Development (2018), p.8.

## 3.2 COMPETING FOR ATTENTION

As already said, many zero-price online markets are characterized by the presence of businesses who attract consumers on their platforms offering various free products and services like social networks, search engines, news, entertainment content and more. These are two-sided platforms, the providers of such services then make profits by selling consumers' attention to advertisers. Because of this business mechanism, these platforms have also been defined "attention brokers"<sup>66</sup>. As noted many times, this business model appears to be one of the pillars of the online economy so that this is also sometimes referred as the "attention economy".

Attention markets are characterised by the presence of three actors: consumers, who supply attention; advertisers, who demand consumers' attention; attention brokers, who compete for users' limited time and sell it to advertisers, ultimately performing the task of connecting the two groups, extracting value from this activity. "Attention" becomes so the relevant dimension of competition between online platforms<sup>67</sup>.

### 3.2.1 What makes consumers' attention valuable: advertisement

As anticipated in section 3.1, there are various theories that describe its functions. Some of them support the informative function that advertisement does in facilitating the decision-making process of consumers. In reducing the transaction costs and facilitating the exchange, advertisement would have a pro-competitive effect that makes consumers more aware of the available options and prices. Other theories underline instead the persuasive function, that consists in influencing costumers' preferences of one product over another, irrespective of their actual quality. This would instead have an anti-competitive effect.

Woodcock (2019)<sup>68</sup> states that the information function of advertisement becomes obsolete in today's economy where "consumers have the power to access all of the useful product information they want, at virtually no cost, just by running a Google search". Because of its lack of economic justification, advertisement leads to a competition based on persuasion, instead of salient features like price and quality, and it is therefore "necessarily anticompetitive".

By contrast, Evans (2017)<sup>69</sup> explores the possible welfare gains derived by advertisers and consumers. The advertiser normally believes that by delivering the ads it increases

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<sup>66</sup> Wu, T. (2015), "Attention Brokers", *NYU Law*.

<sup>67</sup> Evans, D., S. (2013), "Attention Rivalry Among Online Platforms", *Journal of Competition Law & Economics*, 9(2), 313–357, p.314.

<sup>68</sup> Woodcock, R., A. (2019), "Advertising as Monopolization in the Information Age", *Competition Policy International, Antitrust Chronicle*, Spring 2019, Vol. 1(2), 50-54, p.51.

<sup>69</sup> Evans, D., S. (2017), "The Economics of Attention Markets", *SSRN Electronic Journal*.

the chances that a consumer will make a purchase. When the expected value to the advertisers exceeds the expected cost that the consumer incurs in receiving the message, the exchange becomes efficient<sup>70</sup>. Newspapers were the first medium in solving this externality, prior to their advent of the 18<sup>th</sup> century there was no way to compensate consumers for the cost of giving attention to advertisements. Through the news and the entertainment offered by the newspaper at a below-cost price, the consumer was compensated and the result welfare enhancing for both of the parties. Following this reasoning, the multi-sided platforms of the today's online economy would provide positive welfare effects for both consumers, who enjoy free services, and advertisers, who are able to send very effective messages.

In sum, whether by increasing the desirability for the product or by providing customers with useful information, advertisement's mechanisms justify the reasons for which businesses find access of consumers' attention extremely valuable<sup>71</sup>.

There are many different kinds of online advertisement. The biggest distinction is made between search-based and non-search-based ads. Search-based ads are displayed in addition to search results when a search engine is used. The fact that the ads appear on the basis of the object of the search makes them particularly accurate and highly valued by advertisers. Non-search-based ads include "display advertising" which is shown on arbitrary websites and, for instance, can be aligned to websites' respective content. Display advertising can contain graphical advertising, text, images, animations or videos<sup>72</sup>. The majority of this kind of ads is targeted on the basis of information on the person visiting the webpage.

Ads are paid by advertisers on the basis of the number of individuals who have seen them or on the number of individuals that have actually clicked on them.

### 3.2.2 Attention as a resource

Attention can be intended as a resource available to humans, with some particular features that make it different from the others. To begin, its supply on an individual level is limited by time<sup>73</sup> and, unlike money, cannot be expanded. Every individual faces a constraint of 168 hours available per week, and this amount is equally distributed no matter the level of wealth or age. This of course doesn't mean that advertisers value reaching everyone equally, but that attention is a limited resource and that it is therefore scarce.

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<sup>70</sup> Evans, D., S. (2017), p.14.

<sup>71</sup> Wu, T. (2015), p.8.

<sup>72</sup> Monopolkommission (2015), "Competition policy: The challenge of digital markets", Special Report No 68, p.39.

<sup>73</sup> Wu, T. (2015), p.11.

When a new website comes to exist, people have to shift their attention from some other activity to spend time on it. Whether this is time that they were spending online or offline, they cannot increase their total amount of attention. Evans (2013) notes that the amount of time people spend online, from smartphone, tablets or laptops, is dramatically increased in the last decade and it is approaching to a saturation point, since there are essential activities that necessarily need to take place offline<sup>74</sup>. It becomes so increasingly difficult to convince people to switch their time from offline to online. This makes more plausible that today's competition for attention happens between attention brokers rather than between them and all the other activities.

Unlike money or material resources, time cannot be stored. Individuals are constantly spending their attention and attention brokers constantly seeking for it. Individuals make decisions on where to spend their fixed amount of time, like with a currency, depending on their personal preferences<sup>75</sup>.

### 3.2.3 Attention brokers

Attention brokers reflect the structure of intermediaries of the two-sided markets with some unique features. As noted by Wu (2018)<sup>76</sup>, their pricing decisions need to be analysed on two different levels due to their peculiarities.

On one level, as in the traditional analysis of two-sided markets, providers set the price for their online services equal to zero when doing so makes possible to maximise the number of users and the profits made on the other side. At the same time, they set the rates for advertisement considering various factors like quality, size and kind of the audience, accuracy and competition.

On the other level, attention brokers need to take a decision with regard to the right, profit maximising, balance between content and quantity of advertising. What makes an online service attractive is of course the quality of its content. On the contrary we can assume that the higher the quantity of advertisement it presents, the higher is the disutility consumers will get from it, making the service less desirable. This generates a trade-off for firms. Less advertisement probably means a larger audience, while representing at the same time their primary source of revenue. Providers will therefore try to find the "mixture that maximizes its revenue without degrading the product too much"<sup>77</sup>.

In the traditional pricing decision, when a firm raises its price two forces come into action: on one side, a higher price means higher revenue on each unit sold, on the other side this leads to a reduced quantity sold. Likewise, if a social network or a video

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<sup>74</sup> Evans, D., S. (2013), p321.

<sup>75</sup> Wu, T. (2015), p.12.

<sup>76</sup> Wu, T. (2015).

<sup>77</sup> Wu, T. (2015), p.14.

streaming platform increases the amount of advertisement it will face the same two effects: it will have more potential sources of revenue but users will switch to competitors, contrasting the first effect on the revenue balance. In traditional markets, economists define as the reservation price the highest price at which consumers are willing to buy a product. Similarly, in attention markets there will be a sort of reservation price in terms of acceptable balance between the desirable content and the advertisement content.

Of course, this reasoning is based on the assumption that ads are undesirable from a user's perspective. Targeted ads tend to mitigate a bit this effect because they are able to deliver messages that are likely to be more relevant to users than traditional forms of advertising. Nonetheless, the wide use of adblockers software confirms that ads are generally perceived as an annoying content<sup>78</sup>.

These pricing dynamics would be confirmed by the strategy adopted by Facebook. As noted by Wu<sup>79</sup>, the social network platform in its early stages was characterised by the presence of very few advertisement contents. This, together of course with a lot of attractive functionalities, gave it a competitive advantage with respect to its competitors like Myspace, who was instead already using a lot of advertisement on its platform. Many have underlined that from 2010 Facebook changed its policy and started to focus more on maximising revenue. This was made, together with data collection activity, by increasing the amount of advertisement dramatically. Facebook started to raise its "price" because of its gained market power in the social network industry, following a scheme analogous to a predatory pricing strategy.

### 3.2.4 Competition in attention markets

Attention brokers compete with each other for attracting consumers' attention. As discussed, competition focuses on acquiring shares of the time that users already spend online, since it is difficult that this can increase due to additional shifts from offline to online. The question becomes whether shifts due to time reallocation online happen only between providers of similar services or also between more broadly defined internet services. Evans' analysis provides evidence that attention brokers compete with each other, at least to some degree, also across broadly defined categories of internet products and services<sup>80</sup>.

Providers relax competition through a high degree of differentiation between them. Products are designed in such a way that enables to attract a certain type of user or a particular kind of attention. For Evans such differentiation is relevant, to a certain

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<sup>78</sup> Wu, T. (2015), p.15.

<sup>79</sup> Wu, T. (2015), p.17.

<sup>80</sup> Evans, D., S. (2013), p.324.

degree, only from the perspective of users<sup>81</sup>. Advertisers are interested in reaching particular types of consumers that are likely to be interested in their products, no matter the medium through which the ads are visualised. Of course, the target of a company producing videogames for young people is unlikely to be present on LinkedIn, but from the company's perspective YouTube could be a substitute of Facebook, even though they supply different services, not substitutable from a user's perspective.

Not considering these dynamics could lead to some errors in market definition, the starting point of any antitrust analysis<sup>82</sup>. Competition authorities could fail at identifying the competitive constraints that providers of different services actually pose to each other. Not considering the two merging parties to belong into the same market, welfare reducing mergers could be approved ignoring the effect that these could have in prices for online advertisement.

As sustained by Wu<sup>83</sup>, this vision may confuse substitution on one side of the market with the other. Focusing only on what is substitutable from an advertiser's perspective misses the effect that can happen on the user's side.

### 3.2.5 Possible anticompetitive effects in attention oligopolies

Concentration in zero-price ad-supported online markets can lead to the formation of significant market power for attention brokers, with possible anticompetitive effect on both sides of the market. While competition authorities tend to focus on the effect that concentration can have on the market for online advertisement, consumers may also suffer from reduced competition in attention markets.

A very recent paper by Prat and Valletti (2019)<sup>84</sup> explores the possible anticompetitive effects of concentration on the advertisers' side through a theoretical analysis. They built an economic model involving three actors: consumers, attention brokers (digital platforms), and retail producers, who aim at selling goods to consumers and advertise their products through digital platforms. The intuitions and the results are briefly described as follow.

When an attention broker enjoys a certain degree of monopolistic power, it has the incentive to create a "bottleneck" by decreasing the supply of targeted ads. When the number of ads is reduced, it also reduces the number of producers who can access to them, thereby increasing their market power. This can generate higher revenues for the retailers, which are in part absorbed by the platforms due to the price increase of online advertisement. Consumers are ultimately hurt by paying higher prices for the retail product and by a reduction of available choice. "If the attention of the consumer is

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<sup>81</sup> Evans, D., S. (2013), p.343.

<sup>82</sup> Evans, D., S. (2013), 348.

<sup>83</sup> Wu, T. (2015), p.19.

<sup>84</sup> Prat, A., & Valletti, T., M. (2019), "Attention Oligopoly", SSRN Electronic Journal.

controlled by a limited number of platforms, an exclusionary strategy is easier to carry out: ad supply is low and captured mostly by incumbents. Entry is pre-empted and both product prices and ad prices are high”<sup>85</sup>.

Reduced competition in attention market can potentially have a direct negative impact on users, who can face overcharges in terms of “attention costs”. Newman (2015)<sup>86</sup> reports as an example the effects of increased concentration in the broadcast radio market in the US during the 1990s. Even though my thesis concentrates on online markets, this case provides interesting food for thoughts.

In 1996 a deregulation of the US broadcast radio market that relaxed limitations on radio ownership was implemented. This resulted in a dramatic increase in concentration: prior to the deregulation, no single company owned more than forty radio stations, by 2002 a single firm owned over 1200 stations<sup>87</sup>. In its analysis, the DOJ Antitrust Division focused exclusively on possible harms to the advertisers’ side of the market. The users’ side was considered immune to any possible harm since the service was provided for free and a transition to positive prices was of course excluded.

The radio stations exercised their increased market power and increased their revenue through two avenues: by increasing prices for ads or by “exploiting” consumers by increasing attention costs through a higher amount of time dedicated to promotional messages. Evidence showed that as concentration increased, the time devoted to advertisement dramatically increased too, especially in hours of the day in which listeners had fewer close substitutes<sup>88</sup>.

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<sup>85</sup> Prat, A., & Valletti, T., M. (2019), p.3.

<sup>86</sup> Newman, J. (2015).

<sup>87</sup> Newman, J. (2015), p.191.

<sup>88</sup> Newman, J. (2015), p193.

## 3.3 COMPETING FOR INFORMATION

### 3.3.1 The role of personal information in zero-price markets

As described in the previous section, many companies providing free online services compete with each other for users' attention and earn most of their revenues selling it to advertisers. Together with giving their attention, consumers disclose a large amount of detailed information about themselves, their preferences and their behaviour when accessing to free services such as e-mail, search engines, social networks, maps, content streaming and many others. This information is of extreme value for online businesses, as it is crucial in order to target consumers with precise behavioural ads and can be used to customize and improve the quality of the users' service experience, making it more attractive.

The unprecedented volume and variety of data generated in today's economy make it not feasible to be analysed through traditional technics, the control of this information is now increasingly possible thanks to the development known as "Big Data"<sup>89</sup>. As already noted, due to their importance, many have indicated data as the new currency for the digital age, what consumers actually pay for getting free online goods. Whether the parallelism with a currency it is appropriate or not, it remains true that Big Data plays a central role in zero-price digital markets and in the digital economy in general. Data became a key input factor for competing in the internet market and the ability to extract value from it gives rise to a significant source of market power<sup>90</sup>.

Both companies and consumers get many benefits from the large utilisation of personal information, in terms of quality and accessibility of the services. At the same time, there are growing concerns about the superpower that the tech giants have on personal information and the possible risks involving privacy and data protection. The European Commission recognised the role of privacy as a key parameter of non-price (quality) competition<sup>91</sup> in the Facebook/Whatsapp<sup>92</sup> and Microsoft/Linkedin<sup>93</sup> mergers cases. The German Federal Cartel's Office has very recently pointed the conduct of Facebook as abusive of its market power in collecting, using and merging data in users' account<sup>94</sup>.

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<sup>89</sup> European Data Protection Supervisor (2014), "Privacy and competitiveness in the age of big data: The interplay between data protection, competition law and consumer protection in the Digital Economy", p.6.

<sup>90</sup> European Data Protection Supervisor (2014).

<sup>91</sup> Esayas, S., Y. (2018), "Competition in (data) privacy: 'zero'-price markets, market power, and the role of competition law", *International Data Privacy Law*, 2018, Vol. 8, No. 3, 181-199.

<sup>92</sup> Case M 7217 Facebook/WhatsApp decision of 3 Oct 2014, para 87.

<sup>93</sup> European Commission - Press release, 'Mergers: Commission Approves Acquisition of LinkedIn by Microsoft, Subject to Conditions' (IP/16/ 4284, 6 December 2016).

<sup>94</sup> "Bundeskartellamt prohibits Facebook from combining user data from different sources" (2019, Feb) retrieved from

[https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2019/07\\_02\\_2019\\_Facebook.html](https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2019/07_02_2019_Facebook.html)

In light of what has been described above, it is worth to briefly define what Big Data is, how it is used and what are the implications for competition policy analysis.

### 3.3.2 Defining Big Data and personal data

Big Data is normally referred as data characterised by a large dimension of datasets and by the need of using large scale computer power and non-standard software and methods to extract value in a short amount of time<sup>95</sup>. It is common to define Big Data referring to the “3 Vs” that represent its features: volume, variety, velocity. To these, Stucke and Grunes, in their book “Big Data and Competition Policy” (2016)<sup>96</sup>, add a fourth “V”: the value that is possible to extract from the data.

The volume of data collected has dramatically increased and it is forecasted to expand further in the future. The reasons have to be found in the continuous decrease in the cost to collect, store, process and analyse data.<sup>97</sup> Together with this, the wider access to broadband internet connection across the world and the rise of devices like smartphones, tablets, laptops and now of “smart gadgets”, increased enormously the number of consumers that are continuously connected to the web, disclosing personal information to an unprecedented level.

The velocity at which companies generate, access, process and analyse data has also increased, approaching now the real-time and giving rise to a phenomenon called “now-casting”: the ability to analyse and forecast things as they happen.

Together with volume and velocity, also the variety of accessible information has been incremented. Now companies can have access to details such as “household composition, dietary habits, purchasing history, frequency and duration of visits to physical and online stores”<sup>98</sup>. All crucial information when it comes to target costumers for advertising purposes or to price discriminate. The variety of information can be enlarged merging together different datasets, a phenomenon known as “data-fusion”.

While Big Data encompasses a very wide phenomenon and comprises many different types of data, in the contest of zero-price markets the analysis is concentrated on “personal data”. In one of its reports<sup>99</sup>, the OECD provides the following list of personal data. Most of these specific kinds of data can be reconducted to the use of free online service:

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<sup>95</sup> Organisation for Economic Co-operation and Development (2016), “Big Data: bringing competition policy to the digital era”.

<sup>96</sup> Stucke, M., E. & Grunes, A., P. (2016), *Big Data and Competition Policy*, Oxford University Press, UK.

<sup>97</sup> Stucke, M., E. & Grunes, A., P. (2016).

<sup>98</sup> Organisation for Economic Co-operation and Development (2016).

<sup>99</sup> Organisation for Economic Co-operation and Development (2013), “Exploring the Economics of Personal Data: A Survey of Methodologies for Measuring Monetary Value”, *OECD Digital Economy Papers*, No. 220, OECD Publishing, Paris, p.8.

- *User-generated content, including blogs and commentary, photos and videos, etc.*
- *Activity or behavioural data, including what people search for and look at on the Internet, what people buy online, how much and how they pay, etc.*
- *Social data, including contacts and friends on social networking sites.*
- *Locational data, including residential addresses, GPS, and geo-location (eg from cellular mobile phones), IP address, etc.*
- *Demographic data, including age, gender, race, income, sexual preferences, political affiliation, etc.*
- *Identifying data of an official nature, including name, financial information and account numbers, health information, national health or social security numbers, police records, etc.*

### 3.3.3 Purposes of data collection and potential benefits

Data collection enables free online service providers to run detailed analysis of users' profiles and activities. This information is used to constantly optimise and personalize their products, to forecast new trends and implement functionalities that are particularly relevant for the users. Data analysis represents so the engine of the highly innovative capacity of these companies<sup>100</sup> in a process that has been called data-driven innovation (DDI)<sup>101</sup>. These consistent positive gains for businesses may in turn benefit consumers and society in general.<sup>102</sup>

As remarked several times, the collection and analysis of personal information make possible for companies to perform targeted advertisement. There are both companies who are specialised in online advertisement, these usually do not have a direct contact with users and position their ads on the basis of data collected by third parties, and vertical integrated companies that serve both internet users and advertisers, like most of the already analysed two-sided platforms active in zero-price markets<sup>103</sup>. Facebook, for example, makes revenue selling advertisement. It collects and process personal data disclosed by its users and provides information to marketers who are interested in targeting certain types of consumers with ad campaigns<sup>104</sup>.

Many online sellers use data collected by third parties to price discriminate. Combining consumers' information from different sources, included zero-price services, these companies are able to make inference about the willingness to pay of individuals or group of individuals and to reach them with personalised pricing strategies. These can

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<sup>100</sup> Monopolkommission (2015).

<sup>101</sup> Organisation for Economic Co-operation and Development (2016).

<sup>102</sup> Organisation for Economic Co-operation and Development (2016).

<sup>103</sup> Monopolkommission (2015).

<sup>104</sup> Stucke, M., E. & Grunes, A., P. (2016).

be highly precise because based on the revealed habits, location and budget profiles of the individuals. Economic theory suggests that price discrimination can be welfare enhancing when it increases the quantity sold, it is nonetheless mostly benefitting the sellers who are able to exploit all the consumer's surplus. With a personalised price, some individuals will be better off, those who would otherwise not buy the product, and some other worse off, those who pay a higher price.

### 3.3.4 Implications for competition policy

As noted, the Commission in several occasions has indicated that the level of privacy can be considered as an element of competition in zero-price digital markets. It is worth questioning how the degree of market power and concentration in such markets influence the level of privacy.

The OECD<sup>105</sup> individuates data-driven network effects specific to some zero-price markets, especially search engines, social networks and maps, that facilitate concentration and the increase of market power. These are the results of two “feedback loops”. The first is the “user feedback loop”: a company that has a large base of users is able to collect a large amount of data, this will be used to improve the quality of the service that in turn will attract new users. The second is the “monetisation loop”: when a company has a large amount of information, she will perform more precise and remunerative advertising activities on its service. The higher revenue can then be invested in improving the service, making it, again, more attractive to new users. These loops make difficult for new entrants to compete with consolidated incumbents. “As a result, users may become reliant on the dominant platform even though they prefer a different platform model. For instance, while online users may prefer the privacy options promised by some search engines, the larger search engines provide better targeted results”<sup>106</sup>.

Another compelling factor that facilitates concentration in zero-price data-driven markets is the presence of consistent up-front sunk cost. Storing and processing large amount of data require particularly high initial investments in physical and human capital, the incremental expenses are then relatively low. This cost structure is characterised by high economies of scale and scope and can therefore facilitate market concentration of Big Data in the hands of a few players<sup>107</sup>.

Such high concentration, as pointed by Esayas (2018)<sup>108</sup>, has relevant implications for competition in privacy. The very big players holding dominant positions do not have any incentive to compete on privacy and data protection. “The resulting weak competition

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<sup>105</sup> Organisation for Economic Co-operation and Development (2016), p.10.

<sup>106</sup> Organisation for Economic Co-operation and Development (2016), p.10.

<sup>107</sup> Organisation for Economic Co-operation and Development (2016), p.11.

<sup>108</sup> Esayas, S., Y. (2018).

may allow the dominant firms to engage in excessive data collection and offer fewer privacy options than would be the case in a competitive market”<sup>109</sup>.

Whether or not the excessive data collection should be considered as an exploitative abuse is a discussed issue. The German Federal Cartel’s Office has indicated the conduct of Facebook as abusive of market power and exploitative to the detriment of consumers<sup>110</sup>. In particular, the harm to consumers has been identified in their “loss of control” over their personal data that Facebook combines using information from its platforms Whatsapp and Instagram and from other third parties. Haucap<sup>111</sup> has recently criticized this decision and in particular the analogy between data and a monetary exploitative abuse. This because data is not an exhaustible resource and so can be used multiple times by consumers. In sum, consumers could not be exploited of a resource that can’t be reduced in quantity.

A debated explanation to the lack of competition on privacy and data protection, as argued by some scholars, is given by the fact the consumers do not care about privacy and do not make their decision with regard to privacy, in other words “there is no sufficient demand for privacy”<sup>112</sup>. This seems to be confirmed by the so called “privacy paradox”: many survey studies show that consumers express concern about their privacy but, in reality, do very little to protect it and are always willing to disclose information in order to access to better quality services. However, this could be explained by the fact that there is a consistent asymmetric distribution of information between providers and consumers<sup>113</sup> in zero-price online markets and in digital markets in general. It is most of the time impossible for consumers to understand who is collecting and analysing their data, how this is going to be used, what it is its value and whether this is going to be merged with other information. In sum, as said by Esayas, “unless consumers are able to understand properly how firms use their data, they are unable to discipline firms’ behaviour in relation to privacy”.<sup>114</sup>

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<sup>109</sup> Esayas, S., Y. (2018), p.187.

<sup>110</sup>“Bundeskartellamt prohibits Facebook from combining user data from different sources” (2019, Feb)

<sup>111</sup> Haucap, J. (2019), “Data Protection and Antitrust: New Types of Abuse Cases? An Economist’s View in Light of the German Facebook Decision”, *Competition Policy International, Antitrust Chronicle*, February 2019.

<sup>112</sup> Esayas, S., Y. (2018), p.189.

<sup>113</sup> Monopolkommission (2015).

<sup>114</sup> Esayas, S., Y. (2018), 190.

## 3.4 EFFECTIVENESS OF COMPETITION IN ZERO-PRICE DIGITAL MARKETS AND THE ROLE OF ANTITRUST

The discussion made so far has defined the structure of zero-price digital markets and the main dimensions of competition that characterize them. With this in mind, before moving the analysis further on more practical issues, it is important to sum up the findings and to identify the specific role that antitrust law has to play in free online products markets. To do so, I take inspiration from the works of Newman (2015)<sup>115</sup>(2017)<sup>116</sup>. With the aim of recognising the sources of creation, acquisition, exercise and possible abuse of market power, he identifies the systematic deviations that zero-price markets exhibit from the assumptions of the perfectly competitive paradigm.

### 3.4.1 Deviations from perfect competition

The paradigm of perfect competition is a theoretical market structure, it is not descriptive of real markets and it is hardly met into the real-world economy. It is to be intended as a benchmark, an “ideal type” of market against which it is possible to compare real markets in order to test the relative imperfection of competition. In the standard model, a market has to meet several conditions to be defined as perfectly competitive. Among these: a high number of buyers and sellers, homogeneous products, perfect information among participants, no barriers to entry or exit, rational utility maximizing consumers and others. In light of the discussion made in the previous sections about the functioning of competition in zero-price digital markets, it is possible to underline how they systematically deviate from some of the relevant core assumptions.

#### Entry barriers

The magnitude of entry barriers can vary a lot across zero-price markets. While it is possible to create, for example, a mobile app with very few financial resources and no physical investment, data-driven markets, as I wrote in the previous section, require often high up-front sunk cost that are very hard to afford for new entrants. In addition to sunk cost, many zero-price digital markets are characterized by the presence of network effects. Network effects can be direct or indirect. Social network platforms, for example, exhibit direct network effects: the larger the user base, the higher the value of the platform for each member because of the wide possibility to be connected with other people. Other services like search engines or maps are characterised by indirect network effects. The decision of using a map rather than another is not directly made by the consumer on the basis of how many of his or her friends use it, but the accuracy

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<sup>115</sup> Newman, J. (2015).

<sup>116</sup> Newman, J. (2017).

of the map in determining, for example, traffic congestion in real time, and so the quality of the overall service, depend positively on the number of users.

Network effects may raise entry barriers that favour dominant incumbents and induce concentration in the market. Concentration can be efficient in these markets characterised by a “winner-takes all” structure, where competition happens “for the market” rather than “in the market”. The ability of the dominant incumbents to exercise market power can be constrained if markets are contestable, as long as there is potential or actual entry of innovative firms. The high number of “killer acquisitions” limits this possibility: incumbents’ buying entrants with the goal of reducing potential future competition<sup>117</sup>.

#### Imperfect information

As noted, there is a great asymmetry of information between users and providers for free online services, making really hard for consumers to identify the kind of data requested, its amount, value and function. The quantity of advertisement is easier to detect from a user’s perspective. Nonetheless, the assessment is not possible to be made ex-ante but only after having tried the service.

Decisions between different free products and services with regard to these two dimensions are far more complicated than an intuitive price-comparison in the case of positive price markets.

#### Imperfect rationality

As discussed in section 2.3, consumers systematically “overreact to the free product as if zero price means not only a low cost of buying the product, but also an increased valuation”<sup>118</sup>. The so called “zero-price effect” explains behavioural deviations from the “rational paradigm” through which individuals accurately assess the cost and the benefits associated with the consumption of a good or a service and choose the options that lead to the highest welfare surplus<sup>119</sup>.

### 3.4.2 The role of Antitrust in zero-price digital markets

When competition in markets works properly, firms are incentivized to innovate, increase quality, reduce costs and prices. The welfare is maximised and consumers benefit from choosing the best products at the lowest prices. The discussion above has indicated that there are obstacles limiting the efficiency of the competitive game in zero-price digital markets.

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<sup>117</sup> Lear (2019), “Ex-post Assessment of Merger Control Decisions in Digital Markets”, document prepared for the Competition and Markets Authority.

<sup>118</sup> Shampianer, K., Mazar, N., Ariely, D. (2007), p.743.

<sup>119</sup> Newman, J. (2017).

Antitrust has been defined as “the set of policies and laws which ensure that competition in the marketplace is not restricted in such a way as to restrict economic welfare”<sup>120</sup>. Since in zero-price digital markets the main costs to consumers are in terms of attention and information, Newman<sup>121</sup> states that antitrust should ensure that competition works in such a way as to allow consumers to access to the best product at a price of zero, while minimizing the non-monetary prices: information and attention.

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<sup>120</sup> Motta, M. (2004), *Competition Policy: Theory and Practice*, Cambridge University Press, UK, p.38.

<sup>121</sup> Newman, J. (2015), p.177.

## 4. ANTITRUST ISSUES AND ANALYTICAL CHALLENGES

In part 3 I identified the levels on which competition occurs in zero-price digital markets, the nature of barriers to entry, the sources of creation and possible abuses of market power, the ways in which consumers can be harmed. The analysis in part 4 turns on more practical issues. To what extent is the traditional antitrust analysis framework able to detect and solve problems in zero-price digital markets? Is it enough to adapt and reinterpret the traditional price-centred tools or do we need new ones? In this part I try to answer to these questions going through all the classical steps of the antitrust analysis and considering various possible anticompetitive scenarios in the context of free digital goods. To do so, I rely on case studies and on hypothetical situations. The discussion shows how the absence of positive prices makes the analysis more complex and less suitable to be performed according to rigid schemes. A case by case approach is needed and this must take into account two main factors: (i) the importance of considering the relationships between the free goods and the other economic activities where firms make revenue; (ii) the recognition of new theories of harm that account for ways other than prices through which firms can exert market power.

### 4.1 MARKET DEFINITION

In this section I explore issues related to the definition of the relevant market. I first consider why, when dealing with zero-prices, market definition cannot follow predetermined schemes and practices. It has to be based on a case by case analysis that considers the relations between the free product and companion paid products or markets and the reactions of consumers to changes in dimensions other than price.

In the absence of positive prices, the SSNIP test is inapplicable. At least in theory, a modified version that considers changes in quality instead of prices could be used. In the second part of this section I describe the difficulties of implementing the SSNDQ test and I follow the OECD in arguing that it seems to be more a conceptual guide than a quantitative viable option.

#### 4.1.1 The role of market definition and the challenges in zero-price markets

Defining the relevant market represents the first step in the determination of market power, it is therefore the starting point of any antitrust investigation or merger review. As stated in the Commission notice<sup>122</sup>, the main purpose of market definition is to

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<sup>122</sup> COMMISSION NOTICE on the definition of relevant market for the purposes of Community competition law (97/C 372/03).

“identify in a systematic way the competitive constraints that the undertakings involved face”. The market is defined according to its product and geographic dimensions. Two or more products or services belong to the same relevant market as long as they are seen as interchangeable or substitutable by consumers, with regard to their characteristics, their prices and their intended use<sup>123</sup>. Demand substitutability plays therefore a central role in the determination of the relevant market.

The so called “hypothetical monopoly test” represents the conceptual method most widely used by competition authorities to determine which products exhibit enough substitutability to be part of the same relevant market. The test consists in finding whether a hypothetical firm controlling all the sales of the product(s) under examination could profitably apply a “small but significant non-transitory increase in price”, abbreviated with the acronym SSNIP, that constitutes the other name for which the test is known. In practice, the test verifies whether the hypothetical monopolist could profitably sustain a price increase between 5% and 10% or whether there exist substitutable products to which consumers would considerably switch their demand, making the price increase unprofitable. In the latter case, the substitute products are then included in the relevant market. The process is repeated until the point in which a SSNIP becomes sustainable<sup>124</sup>.

It appears clear that such method becomes inoperable when dealing with free services, since a 5% increase of a price of zero is still zero. Furthermore, as noted by Gal & Rubinfeld, the price-centred approach to market definition does not take into account other ways to exercise market power that are of particular relevance in the case of free goods such as reduced quality and variety or diminished innovation<sup>125</sup>. Another challenge posed by the application of the SSNIP test is that it usually relates to a single market<sup>126</sup> while, instead, free products are often offered together with a companion product or subsidised by the other side of a two-sided market. Considering these dynamics when analysing the competitive constraints is hence of crucial importance.

Evans<sup>127</sup> notes that when the free product is related to a paid product, the boundaries of the markets are not always easy to define. A correct analysis of market power, that considers the interrelated nature of the products, might eventually solve the problem. When this is not properly done, type 1 and type 2 errors occur. False positives happen when market definition underlines the absence of competitive constraints for the paid product whilst these are present when considering also the free product, or the reverse. False negatives occur when the analysis suggests the non-profitability of small but significant increase in price for the paid product but ignores the harms to consumers in the free product market. Similarly, when dealing with two-sided markets there is a need

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<sup>123</sup> COMMISSION NOTICE on the definition of relevant market for the purposes of Community competition law (97/C 372/03).

<sup>124</sup> Belleflamme, P. & Peitz, M. (2010), *Industrial Organization: Markets and Strategies*, Cambridge University Press, UK, p.33.

<sup>125</sup> Gal, M. S. & Rubinfeld, D. (2016), p.32.

<sup>126</sup> Gal, M. S. & Rubinfeld, D. (2016), p.32.

<sup>127</sup> Evans, D. S. (2011), p.20.

of considering that competition takes place on both sides. The two main approaches consist in focusing on the market in which a profit-making trading relationship takes place<sup>128</sup> or in considering two separately markets, taking into account their interdependences.

In its report “Competition Policy for the digital era”<sup>129</sup>, the European Commission underlines that “the importance of market definition, and the methodologies developed for identifying it, were built for standard goods and services” and that in today’s digital economy it becomes difficult to clearly set the boundaries between different markets. Their interdependence, once again, must be considered at the heart of the analysis and less emphasis put on market definition in favour of an increased importance attributed to the theories of harm.<sup>130</sup>

Moreover, a common denominator to many digital markets, including those involving zero-prices, is that they are extremely dynamic, exhibiting fast changing substitutability patterns characterised by the possible overlap and convergence to similar services provided by different platforms<sup>131</sup>. Therefore, determining the substitutability based only on the current situation, without considering the possible evolution of the markets, can lead to a too narrow market definition. This is particularly true in merger cases, analysed ex-ante by competition authorities that need to adopt a forward-looking approach to market definition.

#### 4.1.2 A SSNIP test based on quality: the SSNDQ test

At least in theory, it is possible to apply a modified version of the SSNIP test that takes into account a decrease in quality rather than an increase in price. The analysis would therefore move on considering the possible demand switch due to a small but significant decrease in quality (SSNDQ). There are a lot of difficulties in making this test applicable because quality is a parameter that is hard to measure precisely. Moreover, it is difficult for consumers to detect certain changes in quality, especially if these must be “small but significant”. Therefore, as stated by the OECD<sup>132</sup>, the SSNDQ test represents more “a conceptual guide than a precise tool to apply”.

Somehow more workable is the version proposed by Newman (2016)<sup>133</sup>, that substitutes the change in price with changes in the non-monetary costs exchanged by consumers for free products: information and attention. While he refers at this as “SSNIC” test, a

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<sup>128</sup> Gal, M. S. & Rubinfeld, D. (2016), p.35.

<sup>129</sup> European Commission (2019), “Competition policy for the digital era”.

<sup>130</sup> European Commission (2019), p.3.

<sup>131</sup> European Commission (2019), p.47.

<sup>132</sup> Organisation for Economic Co-operation and Development (2018), “Quality considerations in digital zero-price markets”, p.14.

<sup>133</sup> Newman, J. (2016), “Antitrust in zero-price markets: applications”, *Washington University Law Review*, vol. 94, 49-11.

small but significant and non-transitory increase in (exchanged) costs, it can be viewed as a version of the SSNDQ. It concentrates on those two main dimensions of quality affecting competition in zero-price markets that are, to a certain degree, quantifiable. In analysing a merger between search providers, for example, a competition authority could assess whether an increase in the amount of advertisement would lead consumers to switch their demand for search queries towards other providers<sup>134</sup>.

On the quantification of such parameters, the OECD<sup>135</sup> reports that advertising is the simplest to measure because quantifying the percentage of a web page composed by ads or the length of video advertisement to which consumers are exposed is not a difficult task. However, these measures do not take into account the quality of advertisement and its personalization. Privacy, or information cost, might be quantified in some cases but requires a more complex analysis.

Several problems come from the heterogeneity of attention and information costs. Consumers' perception of an increase in the number of ads or of personal data required can vary a lot with regard to the different services. Moreover, consumers' perception of information and attention costs might be inaccurate and unreliable<sup>136</sup>. As I already wrote in section 3.3, users are rarely able to understand how firms use their data and the privacy policies that these apply. This makes really hard for consumers to detect changes and take decisions accordingly. Preferences of consumers are also quite heterogeneous with regard to privacy and attention to advertisement, being the evaluation of the disutility coming from two parameters far more subjective if compared to a monetary expense.

Even when consumers are able to correctly detect quality degradation, they may experience status quo bias<sup>137</sup>, for which they stick to the default option even when a better one is available. The power of this behavioural bias is widely recognised and it would be confirmed by the fact that Google, for example, paid Apple \$12 billion to remain the default engine on Apple's Safari Internet browser<sup>138</sup>.

An additional complication is given by the fact that generally zero-price business models involve both the collection of data and the provision of advertisement content, so it is difficult to understand which of these parameters is more relevant and to which the "small but significant" change should be applied. Furthermore, when the collection of personal data is also functional to the improvement of the services, the role of this hypothetical test becomes even more controversial. A trade-off between the presumed decrease in quality due to reduced privacy and data protection has to be compared with the potential increase in quality that reduced privacy and data collection might allow.

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<sup>134</sup> Newman, J. (2016), p.64.

<sup>135</sup> Organisation for Economic Co-operation and Development (2018), p. 15.

<sup>136</sup> Newman, J. (2016), p.67.

<sup>137</sup> Stucke, M., E. & Grunes, A., P. (2016), p.121.

<sup>138</sup> Segarra, L. (2018, Sept), "Google to Pay Apple \$12 Billion to Remain Safari's Default Search Engine in 2019: Report", retrieved from <https://fortune.com/2018/09/29/google-apple-safari-search-engine/>.

To date, the SSNDQ test has found only one application by the Chinese Supreme People's Court<sup>139</sup> in the *Qihoo 360 vs. Tencent* dispute case. Qihoo 360 and Tencent are two big Chinese internet companies who both offer free products to their users, respectively antivirus and instant messaging, deriving revenue from advertising and additional paid services. The dispute concerned the introduction into the Qihoo's antivirus of a functionality that made possible to control the advertisements displayed by instant messaging apps, including the one provided by Tencent. Tencent responded making its service incompatible with all those provided by Qihoo. Considering inapplicability of the standard SSNIP test, the Supreme Court opted for an analysis based on various quality parameters evaluated by a SSNDQ test, affirming at the same time that the boundary of the relevant market was not as clear as that of more "traditional" markets<sup>140</sup>.

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<sup>139</sup> Charles Rivers Associate (2015, Feb), "Qihoo v. Tencent: economic analysis of the first Chinese Supreme Court decision under Anti-Monopoly Law", available at <http://www.crai.com/publication/qihoo-v-tencent-economic-analysis-first-chinese-supreme-court-decision-under-anti>.

<sup>140</sup> Charles Rivers Associate (2015, Feb).

## 4.2 MARKET POWER

Assessing market power in zero-price markets poses some challenges that make it more complex than when dealing with positive prices. The main difficulties come from the absence of prices, that makes not feasible to rely on the classical analysis based on the level of mark-up, and from the relationships with the economic activities that subsidize the free good. In this section, after defining the role of market power, I analyse the main differences with the traditional analysis, including the computation of market shares and the assessment of entry and expansion in the market.

### 4.2.1 The role of market power and the challenges in zero-price markets

Market power is often referred as “the ability of a firm to profitably raise price above the competitive level in a profitable way”.<sup>141</sup> It plays an important role in the EU competition law because most of the violations that it seeks to prevent depend upon whether a firm or a group of firms detain a certain degree of market power<sup>142</sup>. The existence of dominance, synonym of significant market power and defined as the power to behave independently from competitors and consumers<sup>143</sup>, constitutes a prerequisite for the application of article 102 of the TFEU, that prohibits unilateral conducts retained as abusive of dominant position. Article 101 of the TFEU, prohibiting agreements and concerted practices between firms that eliminate or substantially reduce competition, provides an exemption to its application to those undertakings lacking sufficient market power to impact competition. Lastly, the control over mergers prohibits mergers significantly reducing the degree of competition by limiting the concentration of market power in the hands of a single or few firms in a market.

As indicated by the Commission in the guidance paper to Article 102, the expression “increase prices” above the competitive level includes all those parameters of competition such as “prices, output, innovation, the variety or the quality of a good or services” that can be influenced by the undertakings to their advantage and to the detriment of consumers<sup>144</sup>.

Normally the competitive price is intended to be the marginal cost of providing a certain good or service, so the market power of a firm is reflected by its ability to price above it. The Lerner Index, the measure of the percentage mark-up that a firm is able to charge over its marginal cost, is a tool used for assessing market power. This traditional analysis is not applicable in the case of free goods. The discussion made in parts 2 and 3 has concluded that charging positive prices in digital markets, where the current price is

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<sup>141</sup> Motta, M. (2004), p.64.

<sup>142</sup> Esayas, S., Y. (2018), p.1.

<sup>143</sup> European Commission’s guidance to Article 102 of the TFEU (2009/C 45/02).

<sup>144</sup> European Commission’s guidance to Article 102 of the TFEU (2009/C 45/02).

equal to zero, is very often not a feasible nor a convenient way for firms to exert market power. As discussed in section 2.3, the “zero-price effect” and its consequences on consumer behaviour suggest that “once a product is offered for a price of zero, it can be difficult to charge a positive price afterwards”<sup>145</sup>. It is hard to think, for example, of a search engine starting to charge a positive price for users’ queries.

The absence of the ability of imposing positive prices does not mean, of course, that there is absence of market power. The ways to exert it need to be found in parameters other than the price and in the economic activities through which profits are made. The ability of firms to “unilaterally worsen quality”<sup>146</sup>, especially through the means of increased information and attention costs becomes of particular relevance for market power analysis in zero-price markets. Companies could, for example, start collecting and analysing excessive amount of data by consumers or exposing them to large amount of advertising, like in the case of the US broadcast radio mergers reported in section 3.2. In the case of two-sided markets and complementary products the analysis has also to consider the competitive constraints from related markets<sup>147</sup>.

#### 4.2.2 Market shares

Another traditional measure for market power is represented by market shares, which often replace the price-cost analysis due to the difficulties in calculating marginal costs. The Commission states that “market shares provide a useful first indication of the market structure and of the relative importance of the various undertakings active on the market”<sup>148</sup>. Standard measures for market shares are based on the ratio of sales of a firm relative to the total sales in the relevant market. Dominance is normally assumed when the market share of a firm reaches a certain threshold. As noted by the Commission itself in one of its reports<sup>149</sup>, when zero-price platforms compete with platforms that charge positive prices, like in the music industry, or in the case of freemium models, the quantification of the shares cannot obviously be based only on the paying consumers and so market shares based on sales lose some of its significance in measuring market power.

In the general context of zero-price digital platforms there are different ways of computing market shares. Depending on the one adopted the analysis can lead to different results. For example, in the case of social network platforms, market shares could be computed with regard to the total number of users, active number of users, or time spent on the platform<sup>150</sup>. In the Facebook/WhatsApp merger case, the Commission

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<sup>145</sup> Organisation for Economic Co-operation and Development (2018), p.13.

<sup>146</sup> Organisation for Economic Co-operation and Development (2018), p.14.

<sup>147</sup> Gal, M. S. & Rubinfeld, D. (2016), p.36.

<sup>148</sup> European Commission’s guidance to Article 102 of the TFEU (2009/C 45/02)

<sup>149</sup> European Commission (2019), p.49.

<sup>150</sup> Esayas, S., Y. (2018), p.192.

adopted the method suggested by the merging parties, based on the percentage of users who used a mobile app on Android or iOS in the preceding 30 days, because of lack of reliable data needed for the other methods<sup>151</sup>. Esayas (2018) underlines how a metric based on the effective time that users spend on the platforms can produce more accurate results. First, it reflects better the importance of the application for the end consumers. Second, it provides a proxy of the potential value of the monetization through advertisement on one side, and of the volume of user data that can be extracted from on the other side, since the amount of data provided by consumers is positively related to the time spent on the platform. Third, it makes clearer the market structure in the case of multi-homing.<sup>152</sup>

#### 4.2.3 Analysis of entry and expansion

Being competition a dynamic process, the assessment of market power should be based not only on the existing market conditions but also on its potential developments with regard to the expansion by actual competitors or entry by potential competitors<sup>153</sup>. As already noted, many zero-price digital markets are structured in such a way as to favour competition “for the market” rather than “in the market”, in these cases the analysis of the competitive constraints faced by the incumbents has to consider the level of contestability. The nature of barriers to entry and expansion in zero-price data-driven markets, due to the high up-front sunk costs and the strong network effects, have been already discussed in sections 3.3 and 3.4. That most famous cases in which dynamic competition has succeeded to replace incumbent firms involve the relatively rapid displacements of Yahoo and AltaVista by Google and of Myspace by Facebook<sup>154</sup>. As remarked by the French Autorité de la Concurrence and the German Bundeskartellamt (2016) in their joint report, these examples of successful entrants may not be illustrative because the market conditions have changed a lot ever since and the importance of data in developing new services is higher today than years ago<sup>155</sup>.

As noted by Newman (2016), entry analysis of zero-price markets should consider the barriers to entry or expansion not only in the market in which the free good is provided but also in the interrelated markets<sup>156</sup>. In the case of business models involving complementary products, companies make profits on the product offered at positive price. When the barriers to entry are high in the interrelated product market, entry is unlikely even if barriers are low in the market comprising the free good. To enter the market, the entrant should opt for a positive price in order to recover its costs. The “zero-price effect” suggests that this strategy is unlikely to be successful and that the

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<sup>151</sup> Esayas, S., Y. (2018), p.193.

<sup>152</sup> Esayas, S., Y. (2018), p.193.

<sup>153</sup> European Commission’s guidance to Article 102 of the TFEU (2009/C 45/02).

<sup>154</sup> Autorité de la Concurrence & Bundeskartellamt (2016), “Competition Law and Data”, p.29.

<sup>155</sup> Autorité de la Concurrence & Bundeskartellamt (2016), p.30.

<sup>156</sup> Newman, J. (2016), p.77.

entrant could result in being foreclosed from both markets<sup>157</sup>. The same reasoning works for two-sided markets.

Among the factors that limit the degree of market power of the firms it is worth mentioning the so called “multi-homing”, which is, at least in theory, common to many zero-price digital markets. Multi-homing is defined as a situation in which “consumers use several providers to get the same kind of service”<sup>158</sup>. In practice, its effects on mitigating market power are limited by the extent to which consumers do actually multi-home and by their incentive to do so. In the case, for example, of search engines, as noted by the OECD, consumers may be in fact induced to systematically use the same service as a result of the default options installed on their devices<sup>159</sup>. Markets in which there are high switching costs and network effects also exhibit limited actual multi-homing.

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<sup>157</sup> Newman, J. (2016), p.78.

<sup>158</sup> Autorité de la Concurrence & Bundeskartellamt (2016), p.28.

<sup>159</sup> Organisation for Economic Co-operation and Development (2016), p.17.

## 4.3 ANTICOMPETITIVE CONDUCTS

Market definition and the analysis of market power are steps towards the primary objective of competition policy, that is to identify and limiting conducts that are likely to reduce or eliminate competition, ultimately harming consumers. In this section I analyse the possible anticompetitive conducts in the context of zero-price digital markets and I explore how these fit into the framework of the traditional analysis, underlying when needed the elements that require particular attention. To do so, I rely on case studies or on hypothetical scenarios.

### 4.3.1 Exploitative abuses

Under Article 102 of the TFEU, an exploitative abuse consists in “directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions”. It is an abusive conduct which directly exploits consumers extracting surplus from them. Traditionally, the clearest example of exploitative abuse is represented by excessive prices. This occurs when an undertaking takes advantage of its dominant position in a market to charge supra-competitive prices, without being punished by the market mechanisms for lack of sufficient competition. This practice is difficult to assess because what can be considered excessive or unfair it is not always clear. Moreover, it has always been considered controversial because of the idea that self-corrective markets could solve this kind of problems without intervention.

In the context of zero-price digital markets the traditional framework has to be adapted to the absence of monetary prices. While it is impossible for consumers to suffer from monetary exploitation, an undertaking holding a dominant position could take advantage of the lack of competition and impose to consumers supra-competitive levels of attention and information costs. This is reflected by the decision of the German Federal Cartel’s Office published in February 2019, briefly discussed in section 3.3, that evaluated the conduct of Facebook as an exploitative abuse to the detriment of consumers<sup>160</sup>. The Authority considered as relevant market the one of *social networks in Germany* and established Facebook’s dominant position in it. This was made considering its high market shares of more than 95% (daily active users) and more than 80% (monthly active users), the presence of network effects, barriers to entry, user lock-in, economies of scale and access to competitively relevant data.<sup>161</sup> The exploitative

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<sup>160</sup> Bundeskartellamt (2019, Feb).

<sup>161</sup> Bostoen, F. (2019, Mar), “Can consumers pay too much when they pay nothing? The Bundeskartellamt’s Facebook case”, retrieved from <https://coreblog.lexxion.eu/bundeskartellamt-facebook-case/>

abuse consisted in the “extent to which Facebook collects, merges and uses data in user accounts”<sup>162</sup> which determined a “loss of control” of users over their data.

This case represents the first time in which consumers have been retained “exploited” by non-monetary means in zero-price digital markets and it has raised many criticisms and an open debate on whether it is right or not considering it as a harm to consumers falling under the objectives of competition law. One of the arguments is that since personal data is used not only for advertising purposes but also for improving the overall quality of the service and the users’ experience on the platform, it is unlikely to have a direct harm on them<sup>163</sup>.

#### 4.3.2 Exclusionary abuses

Exclusionary abuses are those conducts that have the aim of foreclosing competitors, preventing them from expanding or entering the market. The undertaking that engages in this kind of practice takes advantage of its dominant position to harm the competitiveness of the other players, or exclude them, in order to strengthen its position, ultimately harming consumer.

*Google Search (Shopping)*<sup>164</sup> represents one of the most relevant cases of exclusionary abuses of dominance involving free digital services in Europe. In 2017 the Commission established that Google abused of dominant position in the internet search market by systematically favouring the results of its own comparison shopping service compared to the competing ones. The Commission defined two separated relevant product markets, the market for general search services and the market for comparison shopping services. Dominance in the market for search service was based on Google's market shares by volume (usage shares), the existence of barriers to expansion and entry, the infrequency of user multi-homing and the lack of countervailing buyer power. The practice of favouring its own shopping comparison in the general search results was considered to have the anti-competitive effect of excluding competitors.

#### Tying

Tying refers to a situation in which consumers that purchase one product (the tying product) are required to purchase another product from the dominant undertaking (the tied product). Tying can have a technical or contractual nature.<sup>165</sup> It is considered anticompetitive when the undertaking uses its market power on the tying product to gain market power and exclude competitors in the tied market and, indirectly, in the tying market. Free goods can be, depending on market conditions, the tying or the tied products. By strengthening the position of the undertaking, the anticompetitive effects

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<sup>162</sup> Bundeskartellam (2019, Feb).

<sup>163</sup> Haucap, J. (2019), p.7.

<sup>164</sup> Google Search (Shopping) - Case AT.39740 ; Summary of the Commission decision available at [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018XC0112\(01\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018XC0112(01)&from=EN)

<sup>165</sup> European Commission’s guidance to Article 102 of the TFEU (2009/C 45/02).

can occur in the markets for the other products included in the bundle and supplied at positive prices or in the zero-price market itself. Moreover, due to their “nudge” qualities presented in section 2.3, free goods can strengthen the motivation of consumers to buy the bundle even beyond their true preferences<sup>166</sup>.

One of the most notable cases involving free digital goods is represented by the tying made by Microsoft between its operating system and its free browser Internet Explorer. In 2009 the Commission started an investigation accusing Microsoft of abusing of its dominant position in the market for client PC operating systems by tying its browser to its dominant PC operating system Windows<sup>167</sup>. The Commission retained that the four criteria needed for establishing a tying abuse under Article 102 of the TFEU were met: (a) the tying and tied goods are two separate products; (b) the undertaking was dominant in the tying product market, since Microsoft had at that time a market share above 90% in the market for client PC operating system according to several measures such as revenues and installed base; (c) the undertaking did not give customers a choice to obtain the tying product without the tied product; (d) the tying was liable to foreclose competition<sup>168</sup>.

The tying was both technical and contractual, since the browser was installed in such a way that users could not technically de-install it from their computers. The concern was that the tying was likely to foreclose the market for web browsers since the market power owned by Microsoft in the operating systems gave to Internet Explorer an “artificial distribution advantage” impossible to match by other competitors, even if it could not be considered a superior product. Moreover, the practice was likely to further strengthen the position of Microsoft in the PC operating system market. The analysis of this case underlines the importance of considering the interrelations between the market in which the free product is offered and the one for the companion paid product.

### Predation

Predation is an exclusionary two-stage strategy which is prohibited by Article 102 of the TFEU. In the first stage, often called “sacrifice”, the dominant undertaking deliberately incurs losses by setting price below costs, with the aim of foreclosing actual or potential competitors and to strengthen its position. In the second stage, the undertaking raises its price and recoup the losses made during the sacrifice period. The E.U. competition law presents a presumption of illegality when prices are set below average avoidable costs (AAC).

As noted by Gal and Rubinfeld<sup>169</sup>, the analysis must be adjusted when dealing with free goods. A price of zero is clearly below the AAC and focusing only on the first stage, without verifying the recoupment, can lead to type 1 errors: overenforcements that can

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<sup>166</sup> Gal, M. S. & Rubinfeld, D. (2016), p.44.

<sup>167</sup> European Commission (2009), “Commission confirms sending a Statement of Objections to Microsoft on the tying of Internet Explorer to Windows”, press release available at [http://ec.europa.eu/competition/publications/cpn/2010\\_1\\_12.pdf](http://ec.europa.eu/competition/publications/cpn/2010_1_12.pdf)

<sup>168</sup> European Commission (2009).

<sup>169</sup> Gal, M. S. & Rubinfeld, D. (2016), p.41,

prevent consumers from getting free services. To make this clear, they report the example of the French case *Bottin Cartographes*<sup>170</sup>. In 2009 Bottin Cartographes, a French firm providing paid online mapping, accused Google of abusing of its dominant position by providing for free its service Google Maps. The Court agreed with the complaint and, on the basis that Google was not recovering its variable costs, ordered a compensation toward Bottin Cartographes for the competitive harm. The Court did not consider the overall two-sided business model of Google that enabled it to recoup the costs in the market for on-line advertising, possibly being welfare enhancing.

Gal and Rubinfeld suggest that the below costs analysis should be based on the prices charged on the other side, in the case of a two-sided market, or on the price for the premium version, when dealing with freemium models<sup>171</sup>. At the same time, as it is most of the time not feasible to start charging positive prices in zero-price digital markets, to the recoupment analysis has to put attention on the related markets or products with positive prices in order to avoid type 2 errors.

#### 4.3.3 Mergers

The analysis of mergers and acquisitions in zero-price digital markets presents interesting challenges and a higher level of complexity than when dealing with positive prices. Due to the characteristics of such markets, largely discussed in the thesis, it appears clear that a proper analysis needs always to consider the bigger picture and not only focusing on what is more easily measurable, the prices. The risk is to incur in type 2 errors, or false negatives, concluding that a transaction is unlikely to be anticompetitive while instead it can produce harm to consumers through non-monetary means. Particular attention has to be given to mergers involving multi-sided platforms. The analysis of the anticompetitive effects should not focus only on the side with positive prices but should consider also the zero-price side.

The possible anticompetitive effects of increased concentration in attention market, on both sides, have been already discussed in section 3.2. I reported a model analysing how reduced competition can impact the advertising side of the market and the example of the U.S. broadcast radio merger wave, in which consumers were harmed by being exposed to a supra-competitive amount of advertising content. It is worth remarking that advertisers and consumers follow different criteria of substitutability. This must be taken into account when evaluating the effects of a merger. A merger between multi-sided platforms, for example two social networks, can have no or little impact on the advertising side, since advertisers may still have outside options like video streaming platforms or search ads, all valuable means to reach the desired target of consumers. This means that, in such scenario, the merger is unlikely to lead to higher tariffs for ads,

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<sup>170</sup> Bottin Cartographes v. Google France and Google Inc. Court of Appeal of Paris, 20 November 2013, available at [http://www.legalis.net/spip.php?page=jurisprudence-decision&id\\_article=3942](http://www.legalis.net/spip.php?page=jurisprudence-decision&id_article=3942).

<sup>171</sup> Gal, M. S. & Rubinfeld, D. (2016), p.43.

because advertisers would switch their demand elsewhere. From the users' perspective, the merger can instead result in a reduction of choice or by increased attention and information costs. This analysis underlines, once again, the importance of considering the potential harm for the two distinct groups of consumers.

A step ahead towards a more comprehensive examination of mergers in zero-price digital markets is provided by the complex analysis developed by the Commission in the acquisition of WhatsApp by Facebook in 2014<sup>172</sup>. It accounted for the impact of on both sides of the platform and evaluated the accumulation of user data as a viable theory of harm. Facebook, together with its famous social networking platform, offers the messaging service "Messenger" and the photo and video-sharing platform "Instagram". All these services are provided free of charge, data is collected from users to target them with advertisement. WhatsApp offers a service of instant messaging through which users can exchange text messages and media files. Unlike Facebook, WhatsApp did not collect personal information and did not sell advertising space on its app but charged, in some countries, its users with a small nominal fee.

The Commission's analysis focused on three areas: consumer communications services, social networking services and online advertising services. With regard to consumer communications service, WhatsApp and Messenger have been considered non close competitors due to the different use that users make of the two apps. The commission recognised the growing importance of privacy and data security as non-price competition parameter but considered the differences in the privacy policies of the undertakings as an element of evidence of not close substitutability. Moreover, the market of instant messaging apps was considered to be dynamic and characterised by the presence of several providers. With regard to the social networking services, the two providers were considered to not compete due to the much wider range of functionalities offered by Facebook.

For what concerns the analysis of the effects on online advertising, since WhatsApp at that time was not selling advertisement space and collecting personal data , the Commission questioned if the acquisition could strengthen the position of Facebook in the market for online advertisement by considering two possible theories of harm: (i) the introduction of advertising space on WhatsApp or/and (ii) the use of WhatsApp users' data for improving the targeted advertisement activity on Facebook. None of the two scenarios was found to be likely to result in anticompetitive effects because of the "sufficient number of alternative providers for the supply of targeted advertising" and of "a large amount of internet user not within Facebook's exclusive control"<sup>173</sup>.

Another debated issue involves the acquisition by dominant platforms of small and rapidly growing start-ups, in zero-price markets and in digital markets in general. While often the effects are clearly pro-competitive in ensuring scalability and financial

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<sup>172</sup> Facebook/ WhatsApp - Case M.7217 , European Commission's decision (2014) available at [http://ec.europa.eu/competition/mergers/cases/decisions/m7217\\_20141003\\_20310\\_3962132\\_EN.pdf](http://ec.europa.eu/competition/mergers/cases/decisions/m7217_20141003_20310_3962132_EN.pdf)

<sup>173</sup> Facebook/ WhatsApp - Case M.7217, European Commission's decision (2014).

resources to innovative ideas and technologies, there may be concerns when the acquisitions are a mean to eliminate potential competition and to raise barriers to potential entrants, strengthening the position of the dominant incumbents<sup>174</sup>. Such transactions may not fall under the Commission's jurisdiction because the turnover of the start-ups, being still at the early stage, doesn't reach the threshold level required. As noted in section 2.2, when describing the two-staged strategies, it is common for tech companies to enlarge the consumer base before starting to generate revenues by monetisation or acquisition by bigger companies, so the turnover is not always an element reflecting the real value of the company.

Moreover, since in the context of zero-price digital markets privacy can be considered a form of horizontal differentiation, due to the different preferences that consumers exhibit with regard to data protection, competition authorities should give particular attention in preventing the acquisition of companies providing services with a greater extent of privacy protection<sup>175</sup>. While often privacy concerns do not fall under the scope of competition law, mergers reducing data protection can negatively affect the welfare of those consumers with high preferences for privacy by restricting their choices.

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<sup>174</sup> European Commission (2019), p.111.

<sup>175</sup> Organisation for Economic Co-operation and Development (2016), p.19.

## 5. CONCLUSION

My thesis aimed at answering the following research questions: how the nature of the competitive game is affected by the condition of prices equal to zero? Which are the dynamics of competition and on which levels do firms actually compete? Can consumers be harmed in the absence of positive price? And eventually, is the traditional antitrust analysis framework, with its price-centred tools, able to assess such issues? In the following, I summarise the main findings and draw some conclusions from the discussion.

### Characteristics of zero-price digital markets

The structure and the specificities of zero-price digital markets have been analysed in part 1. The drastic reduction in the costs of production and distribution of digital goods has made possible the wide diffusion of “free”. Nonetheless, even if small, costs are still present and firms must recoup them in some way to profitably stay in the market. I identified three main business models that allow firms to do so: multi-sided platforms, strategies involving complementary products and freemium models. Common to all of these, even if of different source, is the cross-subsidization that make possible the provision of free goods. Advertisers subsidize users in the case of multi-sided platforms, the companion paid product subsidizes the free product in the case of complementary products strategies, the portion of paying consumers subsidizes all the others in the context of freemium models. The consideration of the interrelations between different products, markets and groups of consumers are of particular relevance in the assessment of the competitive constraints and of the effects of anticompetitive conducts.

Analysing the phenomenon of “free” from the consumer’s perspective, it turns out that a price of zero has a particular psychological effect. Behavioural economists call it the “zero-price effect”: when the price of a product is reduced to zero, consumers overreact and perceive an increase in its intrinsic value. This goes in contrast with the predictions of the traditional economic analysis that considers the rational consumer’s assessment of the costs and benefits associated with a purchase. The “zero-price effect” has several implications for my analysis. The “nudge” qualities of free goods give an additional rationale for their provision and make difficult to compete with them by providing, even superior, goods at positive prices. In particular, in the case of tying involving free goods, there can be the anticompetitive effect of foreclosure both in the zero-price market and in the one for the paid product. The effect also suggests that when a product or a service has historically been supplied at price of zero, it is difficult to charge a positive price afterwards. This mechanism needs to be considered to understand the nature of market power in zero-price markets and how firms can exert it.

### Competition for consumers’ attention and information

Many argue that free digital goods are not truly free, attention to advertisements and personal data would be the currencies paid by consumers in exchange for them. While

this analogy is debated in the literature, there is large consensus on the fact that online companies active in zero-price markets compete for attracting consumers' attention and personal data. These dynamics have particular implication for competition policy analysis.

In section 3.2 I analysed the dynamics of competition for attention. Attention is a resource that humans have in fixed amount, the so called "attention brokers" compete with each other to attract it, by offering free product and services, and sell it to advertisers. This is not only the case of multi-sided platforms but also of hybrid models like many freemium models that offer a free basic version of the service with advertising content. Online competition for consumers' attention happens not only between providers of similar services but also across more broadly defined categories of internet services. Providers mitigate this competition by differentiating from each other. However, the relevance of this differentiation may, to some extent, differ from users' and advertisers' perspectives: advertisers may see as substitutable two providers of different kind services that allow them to reach the same target of consumers. The main conclusion from this section is that consumers and advertisers follow different criteria of substitutability: what is substitutable for consumers may not be so for advertisers, and the opposite. These considerations must be taken into account when evaluating the impact of mergers between multi-sided platforms and ad-supported services providers in general.

Together with giving their attention, consumers disclose large amounts of detailed information about themselves. Online companies compete with each other to collect data and extract value from it, by targeting consumers with behavioural ads and by using it to improve their services. I analysed the dynamics of competition for consumers' data in section 3.3. Data-driven markets present some characteristics that facilitate concentration of Big Data in hands of few players. First, the presence of economies of scale and scope: storing and processing large amounts of data require high up-front investment in physical and human capital, while the incremental expenses are then relatively low. Second, the existence of data-driven indirect network effects makes difficult for new entrants to compete with consolidated incumbents.

Many zero-price markets also present direct network effects. The coexistence of these features favouring concentration facilitate competition "for the market" rather than "in the market". However, the above mentioned factors, together with the presence of switching costs and consumers' behavioural biases, limit the level of contestability of such markets.

#### Consumer's harm in zero-price digital markets

As noted, imposing positive prices is not a viable nor a convenient way for firms to exert market power in zero-price markets. Therefore, possible sources of direct consumer's harm need to be found in non-monetary means. Particularly relevant becomes the ability of firms to unilaterally worsen quality, especially in terms of increased quantity of advertising and data required.

When companies decide on the quantity of advertising behave similarly to traditional companies that search for the profit maximising level of price. Analogously, attention brokers search for the profit maximising balance between desired content, that is what attracts audience, and amount of advertising content, that provides revenue but gives consumers disutility and makes the service less desirable. It is possible to think at the existence of a sort of a reservation price in terms of acceptable amount of advertising, after which consumers switch their demand elsewhere. Lack of competition limit the possibility of users to do so and gives the incentive and the ability to firms to increase the level of ads. Evidence of this effect is given by the case, reported in the thesis, of the U.S. broadcast radio merger wave in which consumers, as a result of increased concentration, were harmed by being exposed to a supra-competitive amount of advertising content.

Lack of sufficient competition may also allow firms to collect excessive amounts of data and offer reduced privacy policies. The German Federal Cartel's Office has recently recognised this as a source of consumer's harm and indicated the conduct of Facebook as an exploitative abuse of dominant position. Whether or not privacy issues fall under the objectives of competition law enforcement is debated. However, since in the context of zero-price digital markets privacy is a form of horizontal differentiation, I retain that reduced data protection can negatively affect the welfare of those consumers that exhibit high preferences towards it, by restricting their choices. This could justify the intervention of competition authorities.

#### Implications for antitrust analysis

Antitrust analysis in zero-price market presents several challenges. The absence of positive prices poses some difficulties at the stage of definition of the relevant market due to the inoperability of the widely used SSNIP test. At least in theory, market definition could be assessed using alternative tests that consider variations in quality, in particular changes in the levels of advertising content and privacy, rather than in prices. Other issues come from the need of considering the constraints exerted by the related markets. However, a correct analysis of market power might help in solving these problems. From the discussion emerges consensus on the fact that more flexibility is needed when defining the relevant market and that more importance should be given to theories of harm.

The assessment of market power is also more complex than when dealing with positive prices due to the impossibility of relying on the classical mark-up analysis. The inability of firms to apply positive prices should not be confused with absence of market power, the ways in which this can be exerted need to be searched in the companion markets and in the non-monetary parameters discussed above. To conclude, the effects of conducts and mergers in the context of zero-price markets can be assessed following the traditional concepts and tools, but these need to be reinterpreted and adapted on a case by case basis, considering the complexity of the relations between different products and markets and new theories of harm that go beyond what is more easily measurable, prices.

### Concluding remarks

Consumers receive many benefits from the wide range of free digital goods at their availability in today's economy. However, the fact that these are free doesn't exclude them from antitrust scrutiny. While the traditional principles and tools of competition law remain relevant and applicable in the context of zero-price digital markets, their competitive dynamics and specificities make their application more complex. To ensure that consumers continue to benefit from zero-price markets, the work of competition authorities alone is not enough. Collaboration should be adopted with authorities and regulators in the fields of consumer and data protection.

## BIBLIOGRAPHY

### Academic articles

1. Esayas, S., Y. (2018), "Competition in (data) privacy: 'zero'-price markets, market power, and the role of competition law", *International Data Privacy Law*, 2018, Vol. 8, No. 3, 181-199.
2. Evans, D. S. (2011), "The Antitrust Economics of Free", *Competition Policy International*, Spring 2011.
3. Evans, D., S. (2013), "Attention Rivalry Among Online Platforms", *Journal of Competition Law & Economics*, 9(2), 313–357.
4. Evans, D., S. (2017), "The Economics of Attention Markets", SSRN Electronic Journal.
5. Ferro, M., S. (2015), "Ceci n'est pas un marché: Gratuity and competition law", *Concurrences*, N° 1.
6. Gal, M. S. & Rubinfeld, D. (2016), "The Hidden Costs of Free Goods: Implications for Antitrust Enforcement", *Antitrust Law Journal*, vol.80.
7. Gaynor, D. E. (2006), "Technological tying", Federal Trade Commission, Working paper no.284.
8. Haucap, J. (2019), "Data Protection and Antitrust: New Types of Abuse Cases? An Economist's View in Light of the German Facebook Decision", *Competition Policy International, Antitrust Chronicle*, February 2019.
9. Holm, A. B. & Günzel-Jensen, F. (2017) "Succeeding with freemium: strategies for implementation", *Journal of Business Strategy*, Vol. 38 Issue: 2.
10. Katz, M. L, Shapiro, C. (1985) "Network Externalities, Competition and Compatibility", *The American Economic Review*, 75(3).
11. Newman, J. (2015), "Antitrust in Zero-Price Markets: Foundations", *University of Pennsylvania Law Review*, vol. 164, 149-206.
12. Newman, J. (2016), "Antitrust in zero-price markets: applications", *Washington University Law Review*, vol. 94.
13. Newman, J. (2018), "The myth of free", *George Washington Law Review*, Vol. 86.
14. Nicolau, J. L. (2012), "Battle Royal: Zero-price effect vs relative vs referent thinking", *Springer Science*, 23(3).
15. Prat, A., & Valletti, T., M. (2019), "Attention Oligopoly", SSRN Electronic Journal.
16. Rochet, J. C. & Tirole, J. (2003), "Platform Competition in Two-Sided Markets", *Journal of the European Economic Association*, 1 (4), 990-1029.
17. Shampanier, K., Mazar, N., Ariely, D. (2007), "Zero as a Special Price: The True Value of Free Products", *Marketing Science*, 26(6), 742–757.
18. Shelanski, H., A. (2013), "Information, Innovation, and Competition Policy for the Internet", *University of Pennsylvania Law Review*, Vol. 161.
19. Spiege, U. et al. (2011), "Free Product as a Complement or Substitute for a Purchased Product - Does it Matter?", *Monetary Economy*, 2(2), 124.
20. Strandburg, K., J. (2013), "Free Fall: the Online Market's Consumer Preference Disconnect", *2013 University of Chicago Legal Forum*, 95-172.

21. Stucke, M., E. & Ezrachi, A. (2015), "When Competition Fails to Optimize Quality: A Look at Search Engine", *Yale Journal of Law & Technology*, 70-110.
22. Woodcock, R., A. (2019), "Advertising as Monopolization in the Information Age", *Competition Policy International, Antitrust Chronicle*, Spring 2019, Vol. 1(2), 50-54.
23. Wu, T. (2015), "Attention Brokers", *NYU Law*.

## Books

1. Anderson, C. (2009), *FREE: the future of a radical price*, Hyperion, (U.S.).
2. Ariely, D. (2010), *Predictably Irrational: The Hidden Forces That Shape Our Decisions*, Perennial.
3. Belleflamme, P. & Peitz, M. (2010), *Industrial Organization: Markets and Strategies*, Cambridge University Press, UK.
4. Motta, M. (2004), *Competition Policy: Theory and Practice*, Cambridge University Press, UK.
5. Stucke, M., E. & Grunes, A., P. (2016), *Big Data and Competition Policy*, Oxford University Press, UK.

## Reports

1. Autorité de la Concurrence & Bundeskartellamt (2016), "Competition Law and Data".
2. European Commission (2019), "Competition policy for the digital era".
3. European Data Protection Supervisor (2014), "Privacy and competitiveness in the age of big data: The interplay between data protection, competition law and consumer protection in the Digital Economy".
4. Lear (2019), "Ex-post Assessment of Merger Control Decisions in Digital Markets", document prepared for the Competition and Markets Authority.
5. Monopolkommission (2015), "Competition policy: The challenge of digital markets", Special Report No 68.
6. Organisation for Economic Co-operation and Development (2013), "Exploring the Economics of Personal Data: A Survey of Methodologies for Measuring Monetary Value", *OECD Digital Economy Papers*, No. 220, OECD Publishing, Paris.
7. Organisation for Economic Co-operation and Development (2013), "Exploring the Economics of Personal Data: A Survey of Methodologies for Measuring Monetary Value".
8. Organisation for Economic Co-operation and Development (2016), "Big Data: Bringing Competition policy to the Digital Era".
9. Organisation for Economic Co-operation and Development (2018), "Quality considerations in digital zero-price markets".

### Online articles

1. Zax, D. (2011, Nov), "Is Personal Data the New Currency?"  
<https://www.technologyreview.com/s/426235/is-personal-data-the-new-currency/>
2. Cohan, P. (2013, June 11), "Four Reasons Google Bought Waze"  
<https://www.forbes.com/sites/petercohan/2013/06/11/four-reasons-for-google-to-buy-waze/#19e36aa1726f>
3. The Economist (2017, May), "The world's most valuable resource is no longer oil, but data" <https://www.economist.com/leaders/2017/05/06/the-worlds-most-valuable-resource-is-no-longer-oil-but-data>
4. Segarra, L. (2018, Sept), "Google to Pay Apple \$12 Billion to Remain Safari's Default Search Engine in 2019: Report"  
<https://fortune.com/2018/09/29/google-apple-safari-search-engine/>.
5. Bostoën, F. (2019, Mar), "Can consumers pay too much when they pay nothing? The Bundeskartellamt's Facebook case"  
<https://coreblog.lexxion.eu/bundeskartellamt-facebook-case/>

### Legal cases and documents

1. Bottin Cartographes v. Google France and Google Inc. Court of Appeal of Paris, 20 November 2013.
2. Case AT.39740 - Google Search (Shopping).
3. Case M 7217 Facebook/WhatsApp.
4. Class Action Complaint, Feitelson v. Google Inc., No. 5:14-cv-02007 (N.D. Cal. filed May 1, 2014).
5. Commission Decision of 24.03.2004 relating to a proceeding under Article 82 of the EC Treaty.
6. COMMISSION NOTICE on the definition of relevant market for the purposes of Community competition law (97/C 372/03).
7. European Commission's guidance to Article 102 of the TFEU (2009/C 45/02).
8. United States v. Microsoft Corp., 147 F.3d 935, 940 (D.C. Cir. 1998).

### Miscellaneous

1. Bundeskartellamt (2019, Feb), "Bundeskartellamt prohibits Facebook from combining user data from different sources".
2. Charles Rivers Associate (2015, Feb), "Qihoo v. Tencent: economic analysis of the first Chinese Supreme Court decision under Anti-Monopoly Law".
3. European Commission - Press release, 'Mergers: Commission Approves Acquisition of LinkedIn by Microsoft, Subject to Conditions' (IP/16/ 4284, 6 December 2016).

4. European Commission (2009), "Commission confirms sending a Statement of Objections to Microsoft on the tying of Internet Explorer to Windows", press release.