BACHELOR'S THESIS

Economics of E-Books: Market Characteristics and the Value of Usage Data

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Abstract

Sales of e-books and associated reading devices grew rapidly within the last years. With market shares up to 25 %, they already are an important part of the book industry. Due to the fact that e-books are digital goods traded in electronic markets, several challenges as well as opportunities arise. One of the challenges is piracy, which is a serious issue for sellers of digital goods. However, the digital nature of e-books also triggers trends like self-publishing and enables new approaches for pricing and distribution, e.g. free samples.

In general, printed books and e-books fulfill the same function, but they are treated completely different in legal terms. A significant difference is that e-books are not sold to customers. By accepting the seller's terms of use, they only acquire a license to read and do not become owners of the e-books. Besides other restrictions, customers are not allowed to resell their e-books. In addition, copyright laws ban potential resellers from making copies which would be a technical necessity within the resale process. Long lasting legal disputes suggest that it is still a long way to go until secondary markets for e-books can be established, but it seems realistic that they will be developed in the future.

Personal data can be seen as a new asset class. The volume of such data is literally exploding, driven by social media, the "Internet of Things" and data transactions. Reading devices for e-books collect data by tracking reading habits, bookmarks and comments. These usage data are valuable for publishers, but users are providing them voluntarily respectively in exchange for services like synchronization. However, users have hardly any option to utilize their data purposeful in exchange for money, while trading personal data between companies is prospering.

In order to support this work empirically, we conducted a survey on the use of e-books. According to the outcomes, only one fourth knows that they are not becoming owners of the purchased e-books. Almost 30 % think it is possible to resell them and most users are not aware of the collection of usage data. Furthermore, it turned out that approximately 40 % are subject to the psychological phenomenon of loss aversion by answering questions on the provision of usage data inconsistently. Nevertheless, 27 % clearly state that they would be willing to pay a small premium for more privacy.

Contents

1. Introduction

Digital goods are establishing themselves in areas where their tangible counterparts were the only option just a few years ago. In addition to other areas, one can also observe these developments in the market for books, where the share of e-books is rocketing. According to the Association of American Publishers (2013) respectively Media Control (2012), e-book sales grew by 45 % in the United States and by 100 % in Germany from 2011 to 2012, while traditional book sales held steady. Especially in the United States, e-books account for a remarkable share of sales in the book market. About 25 % of publishers revenues come from e-books (Wischenbart, 2012, p. 6). In Germany, the share of sales is still very low but there is an enormous increase in e-reader sales[1]. These figures and the continuous popularity of tablet computers, which can be used for reading e-books too, support the assumption that the success story of e-books will continue in future.

In consideration of these developments, the relevance of economic issues within the context of digital goods is increasing. Some examples related to e-books would be: what are implications of the extremely low costs of reproduction and distribution? Are digital goods negotiable assets or not, i.e. should we classify them as private or public goods?

Further exciting questions arise if we analyze the consumers' willingness to pay. A fully rational and informed agent, often referred to as *homo oeconomicus*, would consider that e-readers collect usage data and transmit them back to publishers[2]. These data, without any doubt, are of high economic value, but consumers do not benefit from providing them. Furthermore, consumers usually do not own the e-books in legal terms, they just buy a "license to read" and not the e-book itself[3]. This fact is one of the reasons why there is no market for "used" e-books.

[1] Figures from the German BITKOM show annual growth rates of about 240 % in 2011 and 2012, see (BITKOM, 2012).

[2] Excerpt from the *Kindle Terms of Use*: "The Software will also provide Amazon with information related to the Digital Content on your Kindle and Supported Devices and your use of it (such as last page read and content archiving)", see `http://www.amazon.com/gp/help/customer/display.html/ref=hp_left_sib?nodeId=200506200`, accessed July 4th, 2013.

[3] Excerpt from the *Kindle Store Terms of Use*: "Kindle Content is licensed, not sold, to you by the Content Provider", see `http://www.amazon.com/gp/help/customer/display.html/ref=hp_left_sib?ie=UTF8&nodeId=201014950`, accessed July 4th, 2013.

There are several works dealing with e-books or digital goods. Some of them focus on theoretical aspects[4], others assess electronic marketplaces[5] or discuss specific aspects of e-books[6]. However, there is few literature giving a comprehensive answer to the question: What are implications, challenges and opportunities in the context of electronic markets for e-books?

To put it in a nutshell, this bachelor's thesis analyzes the characteristics of markets for digital goods using the example of e-books. It tries to answer questions which arise from the properties of digital goods as well as from legal aspects, including the very relevant recent developments. Furthermore, this work focuses on pricing and the value of usage data generated by the readers of e-books. The theoretical findings are supported with results from a survey which empirically examines whether (potential) customers are aware of the specific circumstances when using e-books.

Structure of the work

- In Chapter 2, the elementary terms *digital goods*, *e-books* and *(electronic) markets* are introduced. Although these terms seem to be trivial, it is important to emphasize how they are used within the context of this thesis.
- Chapter 3 investigates whether digital goods can be treated as private or public goods and connects this issue with the problem of piracy. Additionally, this chapter takes a look on existing distribution models for e-books and their economic relevance. It gives also an overview on the current situation concerning markets for used digital goods.
- The concept of data as a new asset class is presented in Chapter 4. Furthermore, this chapter analyzes the creation and utilization of e-book usage data and its potential influence on pricing strategies.

[4] Varian and Shapiro (1999), Varian (2000b) and Linde (2008) on properties and implications of information goods and digital goods.

[5] Bakos (1998) on the influence of the internet on markets, Meyer and Treutler (2009) on the role of consumers in digital markets, Quah (2003) and Rayna (2008) on the role of digital goods in markets and Wischenbart (2012) on e-book market development in different countries.

[6] Bonik and Schaale (2012) on piracy, Seringhaus (2009) on ownership and Vassiliou and Rowley (2008) on the definition of e-books.

2. Terminology and Preliminary Information

The following chapter explains the most extensively used terms in order to achieve a common understanding of digital goods, e-books and (electronic) markets. In addition to definitions, this chapter also outlines the history of e-books and describes the conducted survey.

2.1. Taxonomy of Goods

If we talk about *digital goods*, it is necessary to distinguish them from *goods* in general and *information goods* in particular. The latter are goods with specific properties discussed below. Furthermore, digital goods are a specific kind of information goods. From this follows that every digital good is also an information good but not vice versa. Figure 2.1 depicts this relations within a Venn diagram.

Goods. Alfred Marshall introduces this term in his famous textbook *Principles of Economics* as follows: "In the absence of any short term in common use to represent all desirable things, or things that satisfy human wants, we may use the term Goods for

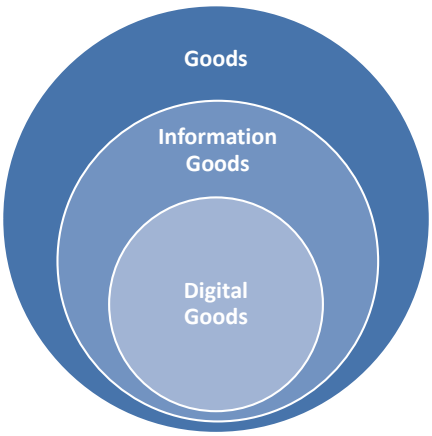

Figure 2.1.: Venn diagram showing the relations between different types of goods.

that purpose" (Marshall, 1890, p. 39). He further differentiates between several types of goods and denotes *economic goods* as those which are owned by a specific person and have a price representing the efforts of production as well as the demands satisfied by these goods. On the other side, *free goods* are "afforded by Nature without requiring the effort of man" (Marshall, 1890, p. 40), for example the air for breathing or the fish of the sea.

Information Goods. Although Marshall also wrote about non-material goods, he did not think of information goods in the sense we do today[1]. Hal Varian sees information goods as "anything that can be digitized–a book, a movie, a record, a telephone conversation. Note carefully that the definition states anything that *can* be digitized; I don't require that the information *actually* be digitized" (Varian, 2000b, p. 3). The second sentence already indicates the difference between information goods and digital goods. In general, one has to consume an information good in order to value it. This is referred to as an *experience good* (Varian and Shapiro, 1999, p. 5f). For example, we have to read a book before it is possible to assess its real quality. Reading reviews and comments can give us a clue about the good's quality, but that is not the whole story. On the other hand, we do not have to use things like fuel for the car or a pencil in order to know how useful it will be.

Digital Goods. Whereas information goods *can* be digitized, it is essential for digital goods that they exist as a stream of binary data. An e-book is a purely digital good, but a printed book is "just" an information good. This differentiation is crucial for many analyses in this work. The most important features of digital goods which distinguish them from information goods are (cf. Rayna, 2008):

- Reproduction and distribution costs of digital goods are in fact negligible.
- Physical distance between seller and buyer does not play a role if the good is distributed via the internet. Digital goods are therefore *aspatial*.
- Digital goods do not depend on a specific distribution medium and their quality does not diminish by using or copying them. Copying is often even needed for consumption, e.g. if one uses streaming technologies. Thus, consuming digital goods does not reduce the consumption possibilities of other people, which is referred to

[1] Instead, he thought of intangible things like professional skills, recreation by leisure activities or beneficial relations to other people.

as *non-rivalness*. Nevertheless, the distribution medium could induce some degree of rivalness as a CD cannot be used by two customers at the same time[2].

- In general, it is possible to exclude others from consuming digital goods by technical measures. Unless sophisticated mechanisms like DRM[3] or streaming technologies are used, every customer is a *potential supplier* of the digital good after he or she has bought it[4]. If several customers offer the good on the internet, less people are excluded from using it. Of course, the good could also be provided for free. In that case, we can treat digital goods as *non-excludable*.

- If the last two features apply, digital goods are *public goods* (cf. Samuelson, 1954). The follow-ups of this fact are discussed in Chapter 3.1.

- Digital goods itself are *infinitely durable*. In practice, they have to be replicated from time to time as the medium used for storing has limited durability. One economic consequence is that these goods do not have to be replaced or renewed.

There is also a very focused definition of digital goods by Dennis Quah: "A digital good is a payoff-relevant bitstring, i.e., a sequence of binary digits, 0s and 1s, that affects the utility of or payoff to some individual in the economy" (Quah, 2003, p. 6).

2.2. Definition of E-Books and Their History

What exactly is an e-book? Vassiliou and Rowley (2008) try to find a general definition based on an analysis of existing definitions. Some of them even include the reading device and not just the digital book. Other common parts of the analyzed definitions are the digital form as well as the analogy to printed books. All things considered, they find the following two-part definition (Vassiliou and Rowley, 2008, p. 363):

1. *An e-book is a digital object with textual and/or other content, which arises as a result of integrating the familiar concept of a book with features that can be provided in an electronic environment.*

2. *E-books typically have in-use features such search and cross reference functions, hypertext links, bookmarks, annotations, highlights, multimedia objects and interactive tools.*

[2] If goods are sold on CDs or DVDs, we call them *semi-digital goods*.
[3] Digital Rights Management, a technology for copyright protection after selling the good.
[4] For example, if a customer buys an unprotected PDF file and spreads it over the internet afterwards. However, this behavior is usually illegal.

Figure 2.2.: Milestones in the history of e-books.

History. Lebert (2009) gives an overview on the history of e-books. One of the first projects dealing with e-books was *Project Gutenberg*[5], launched in 1971. Its founder Michael Hart tried to encourage the creation and distribution of e-books. He started with digitizing books which are in public domain, like the US Declaration of Independence. The first e-books were written in plain text[6] and stored on a Xerox Sigma V mainframe at the University of Illinois (Hart, 1992). Project Gutenberg evolved to a large digital library within the following decades. Nowadays, the collection includes over 30,000 free e-books in various formats.

From 1990 on, the *World Wide Web* served as a new platform for distributing e-books and projects like the *Online Books Page* were launched. The latter is basically a website providing links to free e-books. Others used the WWW as a marketing tool and provided free online versions of printed books. Interestingly, this even increased the sales figures of corresponding printed books.

The online store *Amazon.com*, founded by Jeff Bezos in 1995, started with selling conventional books over the internet. Not before the year 2000, they presented a digital library with some 1,000 e-books. From that time on, they scanned lots of books for the "Search Inside the Book" service. After launching the e-book reading device *Kindle* in 2007, e-book sales took off. Nowadays, Amazon claims to sell more e-books than printed books. Nevertheless, one has to be careful with the figures, as Biermann (2011) points out in an article for a German newspaper. He argues that Amazon compared

[5] See `http://www.gutenberg.org/`.
[6] They used the low set of the American Standard Code for Information Interchange (ASCII).

their e-book sales not with all printed books, but only those where no electronic version exists.

Amazon was not the only company which started selling digital books in 2000. Many other companies came up with their own reading device – to make matters worse, every company had its own format. To name a few examples: the Glassbook Reader, the Rocket eBook Reader and the Palm Reader. The Adobe eBook Reader was also used on PDAs like Microsoft's *Pocket PC*. Due to the multitude of formats, the publishing industry tried to find a common e-book format. Nowadays, there are still different standards, but *ePub* by the *International Digital Publishing Forum* seems to be the most promising format. However, Amazon as the undoubted market leader uses *Mobipocket* for its Kindle e-books.

While there have been technological advances for e-book reading devices in the last years[7], the pervasiveness of other devices like tablet computers and smartphones added even more convenient possibilities for reading e-books. Figure 2.2 summarizes the most important milestones in the history of e-books.

2.3. (Electronic) Markets

Market is an everyday term. However, it is not easy to give a straightforward definition. One way to cope with this issue is to describe a market's main functions. Yannis Bakos writes about the emerging role of electronic marketplaces on the internet and starts with mentioning the three constituting functions of a market in general (Bakos, 1998, p. 1f):

- *Matching buyers and sellers; this includes determination of product offerings, search and price discovery.*
- *Facilitating the exchange of information, goods, services and payments associated with market transactions.*
- *Providing an institutional infrastructure, such as a legal and regulatory framework, that enables the efficient functioning of the market.*

Although Bakos' paper is from 1998 when e-commerce had just a comparatively tiny volume, he already addresses many important implications of electronic markets, i.e. market institutions based on the internet. The following paragraphs summarize the findings and include some remarks from today's perspective.

[7] To name some important improvements: e-ink, touchscreens, backlight, advancements in production costs.

Product Offerings. Electronic markets allow for individualized presentation of products and, at least nowadays, also advertisements. Even services like search results are individualized according to the user's profile. Furthermore, these markets made room for new intermediaries offering aggregated products and services, e.g. travel services.

While one does not necessarily need electronic markets for trading with information goods, the internet is very important for purely digital goods. This includes digitized goods which already existed before like newspapers, but also new product categories like social networks or search engines.

Transaction Costs. The emergence of electronic markets led to an increase in economic efficiency due to lower transaction costs. This includes lower efforts for obtaining product and price information, i.e. lower search costs. Therefore, even new markets emerged where transaction costs had been too high within conventional markets. Recent examples are the various kinds of sharing services connecting people who are willing to share their car, tools or food with others for a small fee.

More efficient price information is not only about price comparison intermediaries, but also about auctions. With electronic markets, online auctions became popular for a wide public[8]. Furthermore, online shops can use price discrimination[9] in order to increase their revenues and profits. For example, there have been rumors that the travel agency *Orbitz.com* used a subtle way of price discrimination. They ranked offers according to the user's operating system, showing Apple users the costlier options (Mattioli, 2012).

Electronic Intermediaries. Due to the low transaction costs discussed above, matching buyers and sellers becomes easier. One the one hand, this leads to *disintermediation*, i.e. when a customer books a flight directly using the airline's website and not via travel agencies. On the other hand, new intermediaries have the chance to create value for customers. Using the flight booking example again, we could observe that many (meta) search engines for flights went online where customers can compare offers and book the best option.

Bakos closes his 1998 paper with: "Internet-based electronic marketplaces are still at a formative stage [...] it is becoming clear that they will promote greater economic efficiency, and help sustain economic growth" (Bakos, 1998, p. 13). 15 years later, we have to draw an ambivalent conclusion. The first large shock for electronic markets was the burst of the so-called *dot-com bubble* in 2000. These developments marked a phase of

[8] Nevertheless, most offers on eBay have a fixed price nowadays.
[9] Variable pricing according to the (assumed) customer's willingness to pay.

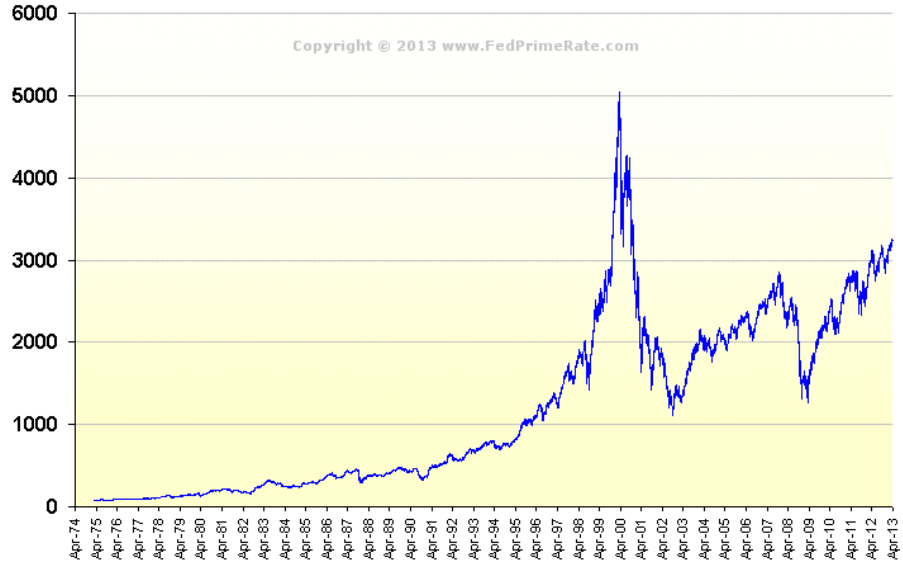

Figure 2.3.: NASDAQ Composite Index from 1975 to 2013 (Source: FedPrimeRate.com).

disillusion and many companies went bankrupt, for example *Pets.com*, *Webvan.com* or *eToys.com*[10]. Nevertheless, many internet companies with a more sustainable business model succeeded. Nowadays, some of them are among the largest companies in the world[11], for example Amazon.com, Google or eBay. The *NASDAQ Composite* stock index has a focus on technology firms and reflects this development, see Figure 2.3. These companies provide users with a large variety of exciting and useful products and services. For many of them, customers do not have to pay a single cent. These free goods are financed by advertisements and by another "currency" which is already referred to as a new asset class: personal data. This topic is discussed in Chapter 4.

2.4. Survey on the Use of E-Books

In order to supplement the theories and facts in this thesis, we conducted a short survey with 10 closed questions on the use of e-books. Here is an overview on the requested information:

- In the first section, participants provided information if they own a e-book reader

[10] For an overview on the largest dot-com flops, see e.g. `http://money.cnn.com/galleries/2010/technology/1003/gallery.dot_com_busts/3.html` from March 10th, 2010; accessed July 10th, 2013.

[11] "Largest" in terms of profits and market capitalization, not in terms of employees.

and whether they use e-books. If they use not just free e-books, but also such with costs, participants are asked if they spend more money on e-books than on printed books.

- The survey's second part is about rights in the context of e-books. We asked if consumers actually own their e-books, if there is an option to resell them and if the primary sellers are in principle able to access a consumer's e-book after downloading.

- The third section deals with usage data. We wanted to know if the reading device collects data and sends it to the seller. In addition, participants answered questions on the willingness to pay for avoidance of such data collections respectively on their willingness to provide such data for a small reduction of the e-book's price.

The questionnaire was spread via e-mail and posts on Facebook at the end of July 2013. We did not collect any demographic data. One the one hand, this helps to keep the participants' privacy. On the other hand, we can already conclude from the spreading method that most of the participants live in Austria, less than 10 percent come from other countries. The vast majority of the 84 respondents is between 20 and 30 years old. The share of university students is, compared to the population, above average.

The appendix of this work documents the survey. Table A.1 contains the questionnaire in its English version and the results. The German version of the questions is documented in Table A.2.

Use of E-Readers and Purchase Behavior. In general, the survey's results are presented and discussed within the corresponding sections of this thesis. Nevertheless, we present already here the outcomes of the questions about use of e-book readers and the participants' purchase behavior. It turned out that the e-reader penetration within the sample is relatively high: almost one fourth of the respondents owns a specific reading device for e-books, see Figure 2.4.

However, over two thirds of the respondents did not buy a single e-book within the last 12 months. Additionally, we asked those who bought e-books if they spent more on them than on printed books. About 42 % did, while the remaining 58 % still seem to prefer printed books. Figures 2.5 and 2.6 put these numbers into graphs.

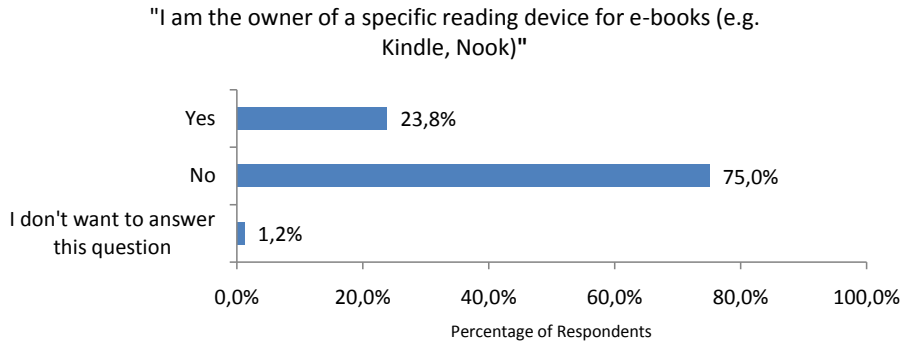

Figure 2.4.: Survey question concerning the ownership of e-readers.

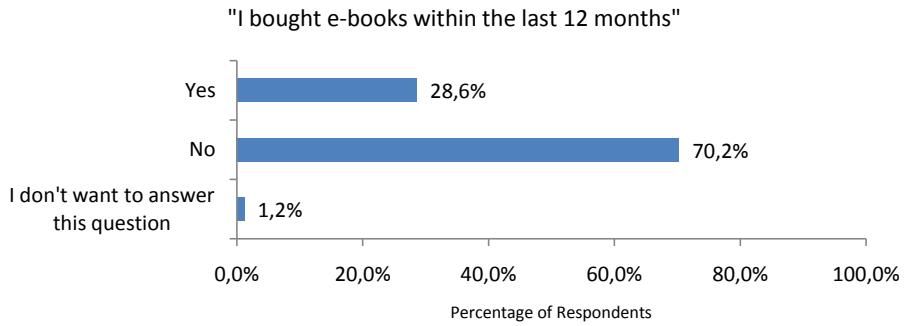

Figure 2.5.: Survey question on the purchase behavior concerning e-books.

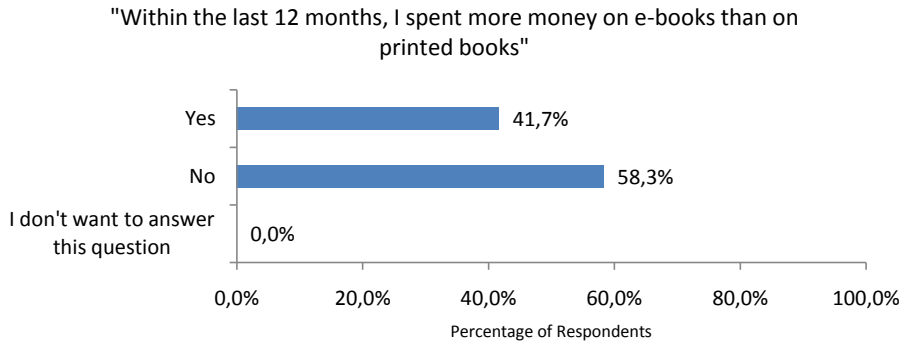

Figure 2.6.: Survey question on the amount of money spent for e-books (answered solely by respondents who bought e-books).

3. Characteristics of Markets for E-Books

Markets for digital goods like e-books have several unique features. This chapter deals with their implications and discusses the problem of piracy. It also focuses on existing and future distribution models for e-books as well as on relevant legal issues and the role of secondary markets.

3.1. E-Book Piracy

At least to some extent, digital goods are non-rival and non-excludable. Hence, they have the character of public goods (see Section 2.1). Rayna (2008) emphasizes the *free-riding* problem of such goods. As people cannot be excluded from consuming the good, they have no incentive to pay for it. Neoclassic theory characterizes this behavior as utility-maximizing and therefore rational. If too many people are not willing to pay for the good, conventional markets will not produce it, at least not with the objective to make profits[1]. However, people would be better off with the good. This is the reason why governments provide conventional public goods like parks, national defense or (toll free) roads.

Obviously, states will not subsidize digital music or e-books to a large extent. Due to the properties of digital goods, their private provision is problematic and publishers have to deal with a severe difficulty: piracy.

Thierry Rayna argues why piracy is rational: "Pirating digital goods is, in fact, free-riding. Leaving aside questions of ethics and morals, this fact is important because it means that consumers cannot be blamed for adopting such behavior, since it is the individual rational behavior in presence of a public good" (Rayna, 2008, p. 19).

Dimension of the Piracy Problem. It is not easy to determine reliable figures on the extent and the economic consequences of e-book piracy. Surveys have to deal with the issue that many participants would not admit downloading e-books from illegal sources.

[1] Especially producers of digital goods often do not have the objective to make money. Examples are open source software or many kinds of "Web 2.0" contributions.

Figure 3.1.: Most popular Google keywords related to "ebook"[4].

Measuring illegal downloads directly is hard due to the diverse and intransparent sources. One possibility to get an idea of the popularity of "free" e-books is to take a look at corresponding Google searches[2]. Figure 3.1 lists the most popular keywords which are related to "ebook"[3]. "ebook torrent" refers quite clearly to illegal sources, but the other terms do not really indicate the users' intentions. We can see that most people are interested in "ebook download" and "ebook free", but it remains unanswered whether users search for legal offers of free e-books or not.

According to a comparison conducted via the web traffic analyzer *Alexa*, search engines intended for finding illegal e-book downloads are as popular as those for legal free e-books. An example for the latter is *Project Gutenberg* (see also Section 2.2), which is one of the largest platforms for such e-books. On the other hand, *Ebookee* and *Bookfi* are popular search engines for illegal e-book downloads. The latter claims to offer more than 2.2 million e-books[5]. Figure 3.2 shows the daily global rank trend of these websites. This rank represents a site's popularity and combines unique visitors and pageviews[6].

[2]This heuristic follows Bonik and Schaale (2012), of course we use here the most recent figures.
[3]We used here "ebook" instead of "e-book" as the former seems to be more popular on the internet. However, according to several dictionaries, "e-book" is the correct spelling.
[4]Screenshot from `http://www.google.com/trends/explore?q=ebook`, accessed July 15th, 2013.
[5]As these sites are just databases with links and some metadata, it is safe to assume that the actual number of available books is much lower due to dead links and multiple entries.
[6]For a detailed description, we refer to Alexa's FAQ, see `http://www.alexa.com/faqs/?p=134`, accessed July 15th, 2013.

Figure 3.2.: Popularity of one legal and two illegal websites for free e-book downloads[7].

The comparison shows that Project Gutenberg and Ebookee have about the same rank, while Bookfi lies behind the those sites. Interestingly, the rank of both illegal download sites had a sharp increase in the first quarter of 2012 and Ebookee had the highest rank among the compared sites. From late 2012 on, the rank dropped again and has about the same level as Project Gutenberg since the beginning of 2013.

These data underline that piracy is definitely a serious issue for publishers and e-book retailers. However, we have to keep in mind that this comparison is just an illustrative example and not a complete overview on the extent of e-book piracy. Availability is not the same as download rates and there are many other download sites which offer legal or illegal e-book downloads.

3.2. Why Do Markets for E-Books Work At All?

Looking at the findings and figures stated above, one could think that markets for e-books or other digital goods cannot work at all, but this would contradict the reality discussed in the introduction of this work. The following paragraphs give some reasons why markets for digital goods do work.

Weak Free-Riding. One should not ignore that free-riding within the context of public goods is a theoretical concept. It is based on mainstream theory and therefore assumes selfish and rational behavior. In reality, people do not always free-ride when they could.

[7] Screenshot from `http://www.alexa.com/siteinfo/gutenberg.org#trafficstats`, accessed July 15th, 2013.

The online encyclopedia *Wikipedia* gives access to lots of high-quality articles[8]. The platform is even free of advertisements. Although everyone can use Wikipedia for free, they collected $25 million in their 2012 fundraising campaign from 1.2 million donors (Roth, 2012).

Haan and Kooreman (2002) provide evidence for the phenomenon of weak free-riding with an empirical study. They analyzed a large dataset containing sales data of candy bars within companies. Employees could take the candy bars out of an open box. Although they should pay for it using a separate container, nobody can be forced to do so. Hence, the candy bars have the character of public goods. The authors find that the average payment lies between 80 and 90 percent of the suggested price. The average payment decreases over time but does not go below 80 percent.

E-Book-Sales within Ecosystems. Owners of Amazon's e-reader Kindle usually buy their content via Amazon's Kindle Store which is either accessible via a web browser or directly via the Kindle. Immediately after buying an e-book, it is transmitted to the registered e-reader. Several other features like reading apps for mobile devices complete the offer. We can see that Amazon tries hard to make buying e-books as convenient as possible. Of course, this holds also for other sellers of e-books.

In economic terms we can state that the transaction costs within such ecosystems are extremely low. On the other hand, it is costly to pirate e-books (cf. Rayna, 2008, p. 20). Search costs are higher, it may need technical know-how to convert the book into an appropriate format and to transfer it to the e-reader. In addition to the higher transaction costs, the quality of pirated e-books could be low, e.g. if the e-book was scanned. Hence, pirating goods could be too costly in economic terms.

Digital Rights Management (DRM). Publishers further use technical measures to prevent users from distributing unauthorized copies of their e-books. These measures can be subsumed with the term *Digital Rights Management (DRM)* and include everything that helps to protect property rights of digital goods (cf. Seidenfaden, 2006, p. 32). For example, DRM can ensure that one needs a specific device to consume the digital contents. DRM is definitely a controversial technology. The *Electronic Frontier Foundation* argues that this set of technologies does not help to ensure digital copyright infringements. Instead, consumers face unjustified constraints in the use of their purchased media[9].

[8] These articles are written by unpaid volunteers. Nevertheless, they need to fund employees and their technical infrastructure.

[9] See `https://www.eff.org/issues/drm`, accessed July 16th, 2013.

Recently, the technology magazine *Wired* reported on a new DRM feature developed by researchers at the German Fraunhofer institute (Baldwin, 2013). The feature is called *SiDiM* and makes every sold e-book unique by altering text elements, e.g. using "not visible" instead of "invisible". The objective of this digital watermark is to identify people who share e-books online even if they remove all the other DRM layers. According to Wired, it is still unclear if the large booksellers are interested in using this new approach. It is obvious that authors will not embrace texts altered by computer algorithms. Another problem arises in particular with nonfiction books: what if modifications change the content's meaning?

Not all e-books are sold with DRM restrictions. Many publishers decided to refrain from using this technology, for example *O'Reilly*[10]. They allow users to read their books on an arbitrary device and even tolerate reselling and donating e-books. Even Amazon allows direct publishers to choose whether they want to use DRM or not: "You may choose, on a per title basis, to have us apply DRM (Digital Rights Management) technology [...]"[11]. The future will show if DRM will survive as a technical measure for restricting the use of e-books.

Legal Issues. Of course, transaction costs and technical measures are not the only reasons for imperfect but still working markets for e-books. In countries with working intellectual property rights, digital goods are protected by law (cf. Rayna, 2008, p. 20). The wordings of IPR laws differ between countries, but it is generally forbidden to sell e-books or to share copies with others. In Austria, the corresponding law states that the duplication of books requests the publisher's permission – even for private purposes. This is critical as many operations with digital goods involve duplication. For example, users are not allowed to lend e-books to friends as they could do it with physical books. Unless they lend the whole e-book reader, the procedure would require a duplication (Schachter, 2010, p. 195). Such legal restrictions clearly decrease the "degree of publicness" of e-books.

3.3. Overview on the Market for E-Books

Publishers and retailers can sell e-books in the same way as physical books, e.g. offering them for a fixed price via online stores. However, the digital nature of e-books offers new possibilities which are accompanied by new challenges. One of the trends triggered

[10] See `http://shop.oreilly.com/category/ebooks.do`, accessed July 16th, 2013.

[11] Excerpt from Amazon's Publishing FAQ, see `https://kdp.amazon.com/self-publishing/help?topicId=A36BYK5S7AJ2NQ#3-13`, accessed July 17th, 2013.

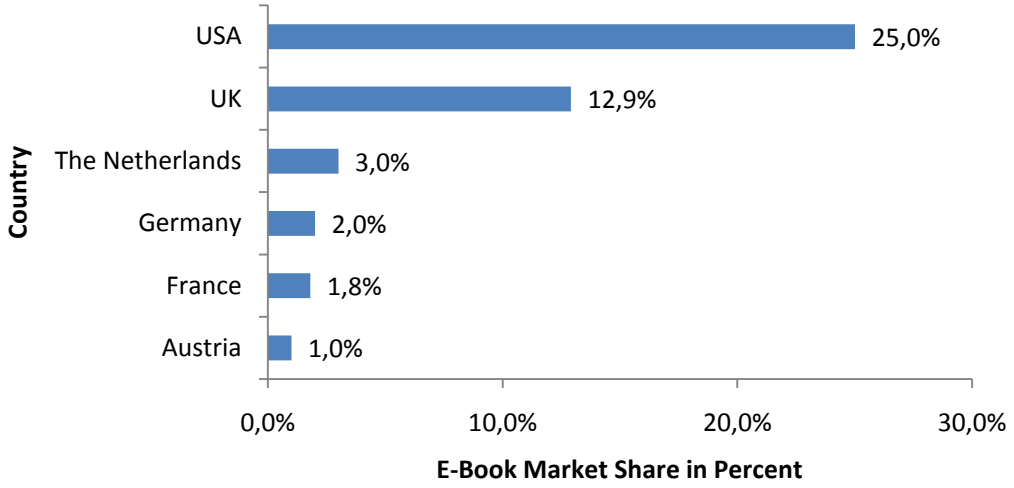

Figure 3.3.: Market share of e-books in selected countries (data taken from Wischenbart, 2012).

by e-books is *self-publishing*, which is a challenge for established publishers, but an opportunity for new authors. Examples for very successful, at least initially self-published e-books are *My Blood Approves* by Amanda Hocking or *Fifty Shades of Grey* by E.L. James (Wischenbart, 2012, p. 60f). The latter is also an example for another trend: globalization. Due to virtual word-of-mouth recommendation and later on also professional marketing on a global scale, this book became a worldwide bestseller very quickly.

Globalization in the e-book industry also stands for the dominance of just few retailers giving them the power to control prices. This led to a recent controversy between Amazon and Apple: in 2010, Amazon sold e-book bestsellers for just $ 9.99. At this time, Apple launched the iPad and planned to introduce an e-bookstore. They wanted to enforce higher prices, so Apple talked to major publishers in order to find a solution. Recently, a federal judge decided that Apple is liable for conspiring with those publishers (Holpuch, 2013).

E-Book Penetration. In Europe, e-books and the corresponding reading devices spread quickly, but the penetration is still low (see Figure 3.3). The market share of e-books is expected to continue its growth, reaching 10 to 15 percent in 2015 (Wischenbart, 2012, p. 74). The vast majority of available e-books is published in English. Correspondingly, the USA and UK with 25 % and 12.9 % clearly have the highest market share of e-books. One reason is the comparatively high acceptance of electronic books by readers in these markets, another is the willingness of publishers to sell e-books. In countries like China,

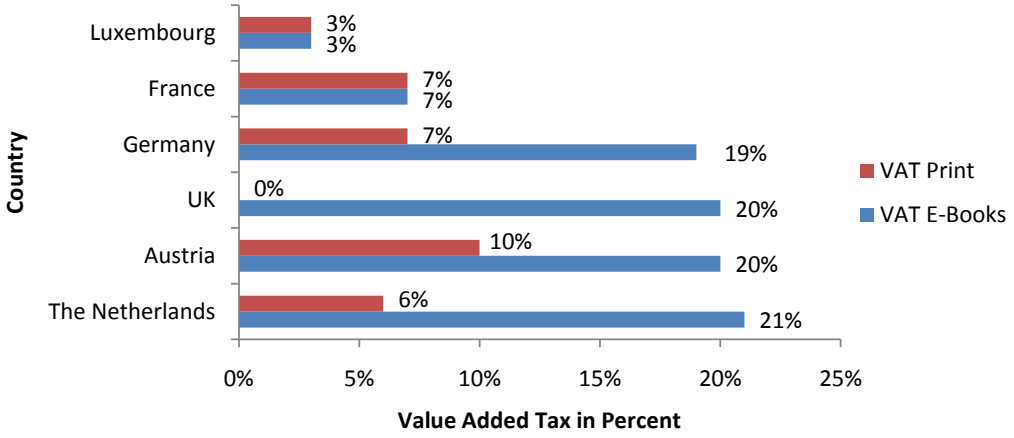

Figure 3.4.: Value Added Tax for printed books and e-books in selected countries (data taken from Wischenbart, 2012).

e-books are not widely used yet, but there are already distribution platforms of relevant size (Wischenbart, 2012, p. 50).

Taxes on E-Books. Printed books are subject to a reduced Value Added Tax (VAT) in many European countries. In most countries, there is a difference between the VAT for printed books and the one for e-books (see Figure 3.4 for an overview). The reason for this difference is that e-books are not treated as books within tax regulations. Especially in the UK, the difference is huge as there is no tax on printed books. In France, e-books are taxed like printed books since 2012 (Wischenbart, 2012).

An interesting case is the small state Luxembourg with its low tax of 3 % on e-books. Although they already had an attractive tax environment for companies, Luxembourg lowered the VAT on e-books from 15 % to 3 % in 2011. Many global e-book sellers[12] have their headquarters in this state since the low tax gives them a significant competitive advantage: consumers do pay the VAT rate of the country where the retailer resides. Thus, sellers earn the highest profit if they operate out of Luxembourg, but this will change in 2015 due to the EU Directive 2002/38/EC. From that time on, the VAT will be charged according to the state where the customer belongs (European Commission, 2013b). Additionally, it seems that France and Luxembourg will have to revoke their reduced VAT on e-books. The European Commission referred them to the Court of Justice for the following reason: "EU law is very clear on which goods and services are eligible for a reduced VAT rate. The provision of ebooks is an electronically provided

[12]Namely Amazon, Apple, Kobo, Barnes & Noble

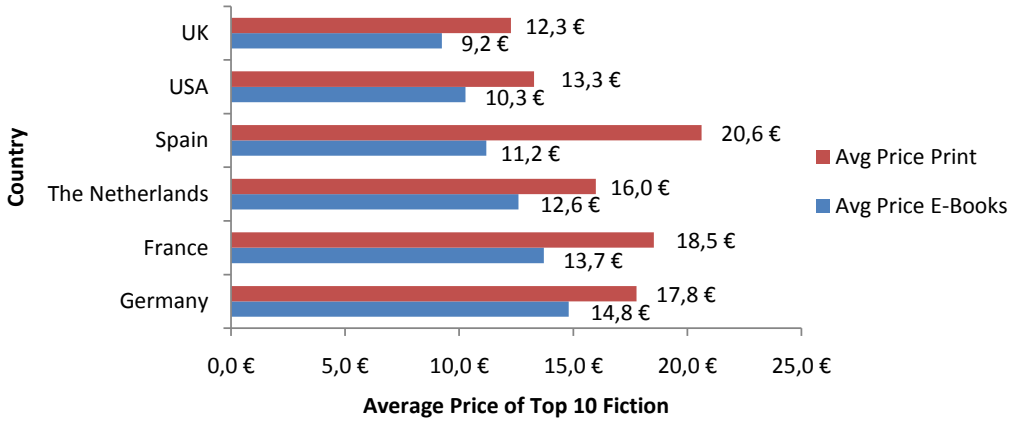

Figure 3.5.: Average price of printed books and e-books in selected countries (data taken from Wischenbart, 2012).

service and as such cannot benefit from a reduced rate" (European Commission, 2013a).

Pricing Strategies. E-books can be reproduced extremely cheap, so the marginal costs of producing an additional unit of the good is almost zero. Standard economic theory would therefore suggest that the price is zero within a perfectly competitive market. In reality, most European countries have fixed book prices set by the publisher and retailers cannot compete via prices. In other countries, prices of e-books are set on the basis of printed books with a discount applied. Figure 3.5 compares average consumer prices for fiction titles in September 2012 showing huge differences. Especially in Spain, e-books are much cheaper than printed ones (Wischenbart, 2012, p. 62f).

3.4. Alternative Approaches for Distribution

Selling single e-books is not the only way for publishers to utilize them. It can be reasonable to distribute them for free. Additionally, there are rental models.

Distributing E-Books for Free. In 1994, some publishers started to use the internet as a marketing tool. They provided the full text of some books free of charge. For example, over 1,000 books were available in the *NAP Reading Room* – in several formats, including PDF. This seemed to be a good marketing tool as there was an increase in sales although internet users could access them for free. The publisher *MIT Press* made similar experiences at that time (Lebert, 2009).

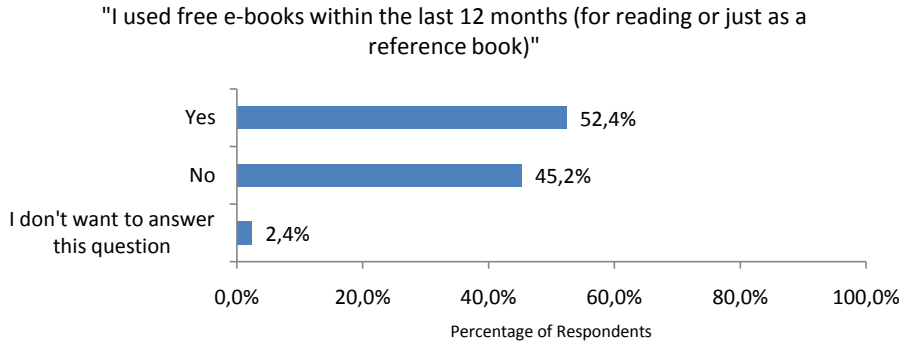

Figure 3.6.: Survey question on the use of free e-books.

Nowadays, even more free e-books are available. Besides *Project Gutenberg* (discussed in 2.2), there are many other sources for e-books which are free of copyright, e.g. *Open Library*[13]. Even online stores like Amazon provide free e-books. In addition to copyright-free classics, users can choose out of many free recent books, as a look at the list *Top 100 Free*[14] in Amazon's Kindle Store shows. The purpose is quite clear: authors provide their e-books for free in order to promote themselves. The author with the current #1 free e-book, Susan Fleet, offers her other e-books for $ 3.49. It is plausible that the free book will boost sales of her non-free books.

Another example for a free e-book is Cory Doctorow's *Little Brother*. Interestingly, it is published under a *Creative Commons*[15] license giving users the right to share and to adapt the work. Adaption means also converting in other formats, so users give others the chance to read the book on various devices[16].

Our survey included a question about the use of free e-books. The results underline the popularity of free e-books: Figure 3.6 shows that more than 50 % of the respondents used them within the last year.

E-Book Rentals. Varian (2000a) analyzes the implications of renting information goods in a theoretical way. He finds that producers will sell less goods if users have the opportunity to rent them. However, the good's price will rise, so it remains unclear if the producer will make less or more profit. Varian identifies several situations where

[13] See `http://openlibrary.org/`.
[14] See `http://www.amazon.com/Best-Sellers-Kindle-Store/zgbs/digital-text/ref=zg_bs_fvp_p_f_digital-text?tf=1`, accessed July 23rd, 2013.
[15] Precisely, it is a *Creative Commons Attribution-Noncommercial-ShareAlike* license, see `http://creativecommons.org/licenses/by-nc-sa/3.0/`, accessed July 23rd, 2013.
[16] See `http://craphound.com/littlebrother/download/`, accessed July 23rd, 2013.

profits would go up. For the case of purely digital goods, he states: "The impact of sharing on profits depends on how the value of the shared good increases as compared to how the number of copies sold decreases. If the first effect outweighs the second, profits will increase, otherwise they will decrease" (Varian, 2000a, p. 6).

There are already several services for renting e-books. Examples from the German market are *Onleihe*[17] and *Skoobe*[18]. The former is a service by public libraries where members can lend e-books for free[19]. As libraries have a limited amount of licenses for each book, the number of simultaneous borrowers is limited too. Therefore, Onleihe.net uses DRM technology by Adobe where the file becomes unusable when the rental period expires.

Skoobe's model is based on a monthly fee. Users have three options with different fees. The cheapest one is currently € 9.99 per month, users can borrow 3 books at the same time. The rental period is unlimited, but customers have to go online at least every 24 hours if they use the basic offer. One has to distinguish such offers from illegal flatrate shops like *online-library.ws*, where books are not licensed by the copyright holders (cf. Bonik and Schaale, 2012, p. 8).

3.5. Legal Aspects: Ownership and Secondary Markets

The analysis of markets for e-books also raises many legal questions which are often directly related to economic aspects. This section discusses ownership issues and gives an overview on the current situation regarding markets for "used" e-books.

3.5.1. Ownership and E-Book Licensing

Who owns the e-books read by consumers on their devices? The answer is usually given in the retailer's fine print, precisely the terms and conditions. Although users "buy" the e-book, they do not acquire ownership. Instead, they buy just a license to read and become possessors of the e-book. Here are some examples of the corresponding terms:

- Barnes & Noble Nook Book Store: "Barnes & Noble.com grants you a limited, nonexclusive, revocable license to access and make personal, non-commercial use of the Digital Content in accordance with these Terms of Use"[20].

[17] See `http://www.onleihe.net/`.
[18] See `https://www.skoobe.de/`.
[19] They have to pay a yearly member fee.
[20] Terms and Conditions of Use, section XII (Digital Content), see `http://www.barnesandnoble.com/include/terms_of_use.asp`, accessed July 24th, 2013.

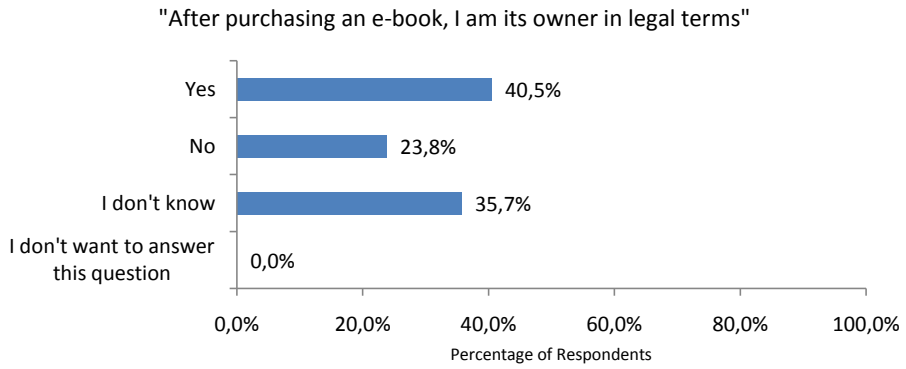

Figure 3.7.: Survey question concerning the ownership of e-books.

- Amazon Kindle Store: "Kindle Content is licensed, not sold, to you by the Content Provider"[21].
- Thalia / Buch.de: "buch.de verschafft dem Kunden an Downloads kein Eigentum. Der Kunde erhält das einfache, nicht übertragbare Recht, die angebotenen Titel zum ausschließlich persönlichen Gebrauch gemäß Urheberrechtsgesetz in der jeweils angebotenen Art und Weise zu nutzen"[22].

The latter straightforwardly states that users do not become owners of the digital goods, indicating that such licensing agreements are common in the German speaking area as well. Nevertheless, the awareness of these facts is low. Figure 3.7 shows the outcomes of the corresponding survey question: over 40 % of the respondents are confident that they own their e-books in legal terms. The share of respondents who are unsure about this question is quite high as well (36 %), while just almost one fourth answered the question correctly. Surprisingly, the share of customers who are aware of the licensing model drops to 17 % if we restrict the dataset to respondents who "bought" e-books within the last year. 50 % of them stated to own e-books in legal terms, the remaining respondents selected the answer "I don't know".

Restrictions On the Use of E-Books. Furthermore, consumers are usually not allowed to sell or rent e-books, to print them or to give them away. The allowed usage is very restricted and basically includes just displaying and reading the content. An implication

[21] Kindle Store Terms of Use, section 1 (Kindle Content), see `http://www.amazon.com/gp/help/customer/display.html/ref=hp_left_sib?nodeId=201014950`, accessed July 24th, 2013.
[22] Allgemeine Geschäftsbedingungen, §2 (1), see `http://www.thalia.de/shop/hilfe_agb/show/#2b`, accessed July 24th, 2013.

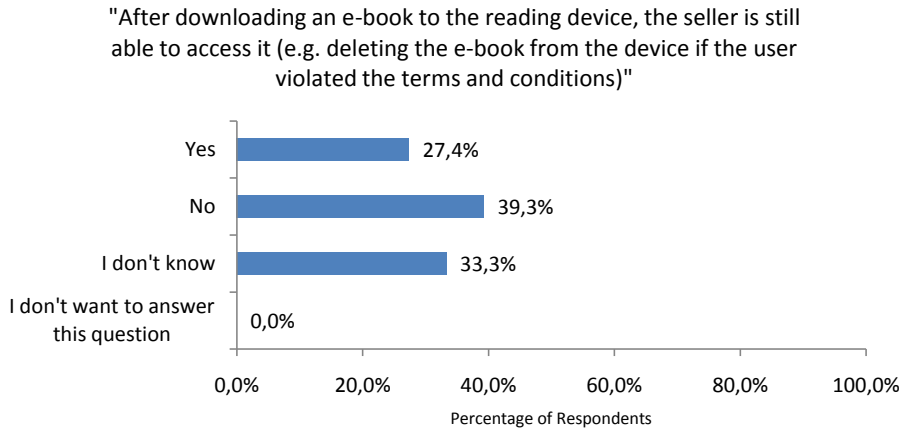

Figure 3.8.: Survey question on the seller's means of access after the sales process.

of licensing instead of selling the e-books is the possibility for retailers to control use of the sold contents. For example, Amazon has the right to "modify, suspend, or discontinue the Service, in whole or in part, at any time" which would highly restrict the Kindle's usability. Furthermore, they can block access to all services if a user fails to comply with a single item of the Terms of Use. It that case, the user's rights terminate and "Amazon may immediately revoke your access to the Service without refund of any fees"[23]. Amazon already made use of these rights, for example in October 2012, when the account of a Norwegian woman was wiped without any warning (King, 2012). Their explanation left many questions unanswered as they just stated that her account is "directly related" to another account which was closed recently due to disregarding of policies.

At least some of the survey respondents seem to have heard about such incidents. Figure 3.8 shows that over one fourth knows about the sellers' possibility to access e-books remotely after the sales process.

Should E-Books Be Treated as Books? These facts and examples demonstrate the large difference between printed books and e-books in legal terms. However, they fulfill the same function, so we should question this practice. Seringhaus (2009) argues why e-book transactions should be treated as sales and not merely as licenses: Sold e-books would become the buyer's personal property, but would still be protected by copyright laws. Seringhaus states: "Wireless e-book delivery is a technological leap and a paradigm

[23] Both citations come from the Kindle Terms of Use, section 3 (General), see `http://www.amazon.com/gp/help/customer/display.html/ref=hp_left_sib?nodeId=200506200`, accessed July 25th, 2013.

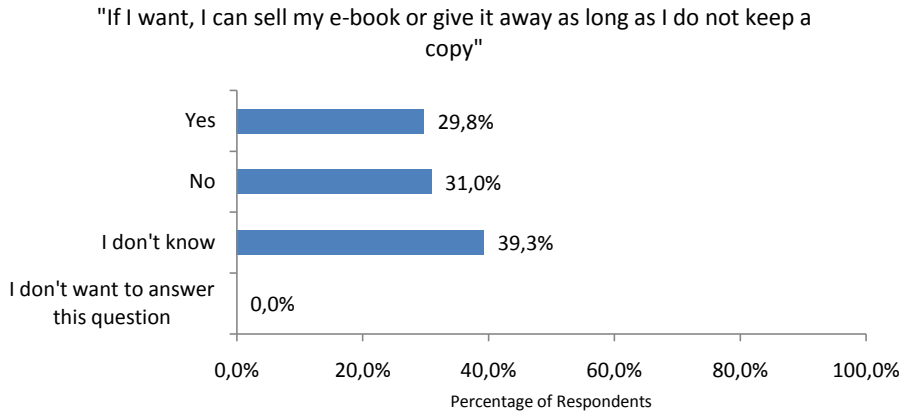

Figure 3.9.: Survey question on secondary markets for e-books.

shift of sorts, but it does not change what a book is, or what personal property is" (Seringhaus, 2009, p. 200).

In fact, online stores treat e-books as a piece of software although we use the latter in a different way than books. An early reason for software licensing was the threat of rentals. Before the US Congress prohibited commercial software rentals in 1990, firms could buy a program and rent copies to many customers. Nowadays, software licensing can be justified with greatly varying valuations between private and commercial users as well as with liability issues in case of malfunction. Both apply only for software and should not be extended to other digital goods (Seringhaus, 2009, p. 164 and p. 201).

Seringhaus suggest retailers should protect e-books with DRM and address the multi-copy problem with technological approaches like registries which ensure that no duplicates can be produced. With these measures and the protection by copyright laws, it should be possible to sell e-books instead of licensing them (Seringhaus, 2009, p. 207). Nevertheless, this approach is not easy to implement as there are (illegal) ways to remove DRM and one has to rely on centralized registries.

3.5.2. A Marketplace for Second-Hand E-Books?

Currently, there is no way to resell previously purchased e-books. When buying e-books from an online store, customers have to consider that they cannot transmit them to another person, regardless if that person would pay for it or not. Everyone has to buy a "new" e-book. Of course, as digital goods do not degrade over time, "used" e-books have the same quality as new ones. That is one of the reasons why publishers and music labels fear massive losses in sales if second-hand marketplaces would emerge, see

e.g. Voss (2012). Despite these facts, people are unsure about the current situation. Almost 40 % of the respondents of our survey do not know if they have the option to sell their e-books. Approximately 30 % think this is possible, while about the same share of respondents knows that there are no secondary markets for used e-books (see Figure 3.9).

Ishihara (2011) argues that depreciation of consumption values of entertainment goods like books, music or videos comes primarily from satiation (*satiation-based depreciation*) and not from physical depreciation. This is a plausible argument. One just has to think of reading a book. With exception of reference books, the individual valuation of a book will decrease after using it. In other words, the marginal value plunges rapidly with the number of consumptions. For some goods, the consumption value goes even down over time without owning it. Ishihara denotes this as *freshness-based depreciation*. He finds that this kind of depreciation rate seems to be very high in the Japanese market for video games, where the willingness to pay is very high in the first few days after introducing the game and decreases quickly afterwards.

The following paragraphs give an overview on further relevant facts within the context of second-hand markets for digital goods, starting with related economic theory.

Economic Theory: Resale and Substitution Effect. Most likely, users would resell used digital goods for a lower price than the retailer does, giving customers the opportunity to buy the same good for a lower price. Hence, used goods are a perfect substitution of new ones, giving the *Substitution Effect* its name (Glatthaar, 2012). Due to this effect, demand for new goods decreases as they face direct competition through used goods. As a follow-up, retailers have to reduce prices.

As depicted in Figure 3.10, the *Resale Effect* works in the opposite direction. If consumers are forward-looking when purchasing digital goods, they will consider the possibility of reselling them later on. As the goods are not "used" in the traditional meaning, the reseller can expect a relatively high price[24]. Hence, his or her willingness to pay will rise, which increases the retailer's sales figures (Glatthaar, 2012).

To sum it up, the resale effect has an influence on the customer's willingness to pay, this holds both for potential buyers of new and used digital goods. On the other side, the substitution effect influences the decision whether the customer buys new or used goods. Both affect the retailer's sales figures, but in the opposite direction. Therefore, it depends on the extent of the respective effect if retailers benefit from second-hand markets or not (cf. Nopp and Hötzendorfer, 2013).

[24]It will be lower than the original price due to freshness-based depreciation.

Figure 3.10.: The opposite effects on prices in second-hand markets.

Further Facts to Consider. There are no doubts that secondary markets for e-books would be a threat for retailers, especially if the substitution effect outbalances the resale effect. Nevertheless, the price is not the only attribute to consider for a customer who has to decide between buying new or used digital goods:

- Transaction costs: again, there is the transaction costs argument, similar to the one in Section 3.2. Unless large retailers like Apple or Amazon integrate marketplaces for used digital goods in their ecosystems, users would have relatively high transaction costs to copy the bought goods onto their devices.
- Not sold in the primary market: like in the market for printed books, it could be the case that retailers simply do not offer an e-book anymore, e.g. due to clearing up the product portfolio. A secondary market would give customers a chance for finding and buying the desired product (Reese, 2003). As a follow-up, discontinued products would not stop circulating in the market.
- Not sold in secondary market: while the item above argues with availability of goods in second-hand markets, it could be the other way round. Especially brand new products will not be sold immediately in secondary markets. Additionally, the amount of offered goods in the secondary market is limited as the sellers are not allowed to reproduce goods. Thus, products could be out of stock. In contrast, retailers in primary markets can sell as much as customers demand.
- Privacy issues: *ReDigi*[25] is an online marketplace for used MP3 music files. Second-hand marketplaces like ReDigi have to ensure that sellers do not have the chance to retain a copy of the sold digital good. ReDigi's client software works as follows (cf. Glatthaar, 2012, p. 13ff): after installation of the local client and registering an

[25] See `https://www.redigi.com/`.

account, users are eligible to upload music files bought either from Apple iTunes or directly via ReDigi. Subsequently, the software inspects whether the uploaded file was bought from one of these sources[26] and deletes all local copies. This is a crucial privacy problem as the software has to scan the reseller's hard disks. After this procedure, resellers have the option to offer it to other users. However, it is not clear if ReDigi offers a legal service. The corresponding issues are discussed in the next paragraph.

Legal Disputes in the US and Europe. One reason why there are no marketplaces for used e-books are the restrictions in the retailers' terms of use discussed above. Customers do not own the e-books they read, so they cannot sell it. In addition, there is also a legal issue with the *First Sale Doctrine*, which is a fundamental part of copyright law. It states that "[...] the owner of a particular copy or phonorecord lawfully made under this title, or any person authorized by such owner, is entitled, without the authority of the copyright owner, to sell or otherwise dispose of the possession of that copy or phonorecord"[27].

Several papers dealing with the applicability of the First Sale Doctrine on digital goods[28] point to the *DMCA Section 104 Report*. Beside other things, this report deals with changes due to electronic commerce and advancing technology. It states that the First Sale Doctrine does not hold for digital goods as transmitting such goods always involves the creation of a new copy: "Unlike the traditional circumstances of a first sale transfer, the recipient obtains a new copy, not the same one with which the sender began. [...] This copying implicates the copyright owner's reproduction right as well as the distribution right. Section 109 provides no defense to infringements of the reproduction right. [...] We therefore conclude that section 109 does not apply to digital transmission of works" (U.S. Copyright Office, 2001, p. 79f).

Despite these legal views, ReDigi tries to establish its second-hand marketplace. One of the producers which fear losses in the light of secondary markets is *Capitol Records*. They filed a lawsuit against ReDigi in January 2012 for various kinds of copyright infringements. ReDigi admits that its process involves the creation of copies – this is an absolute necessity for transferring a digital good. Nevertheless, they emphasize that copying is not directly related to the resale procedure. The file is copied when the user

[26] Hence, users cannot resell ripped music from (legally) bought CDs or from other online stores like Amazon MP3.

[27] § 109(a) of the Copyright Law of the United States of America, see `http://www.copyright.gov/title17/92chap1.html#109`, accessed July 29th, 2013.

[28] For example Reese (2003), p. 582f.

uploads it to the ReDigi cloud. Afterwards, he or she can release the file for sale. The sales procedure itself involves just the modification of a pointer[29] and not copying the file (Glatthaar, 2012, p. 14ff).

According to ReDigi, copying the file on its servers is justified by the *essential step doctrine*. Thus, it is no copyright infringement if "such a new copy or adaptation is created as an essential step in the utilization of the computer program [...]"[30]. Of course, the applicability of this law requires to treat MP3 files or e-books as a computer program. Glatthaar finds justifications to do that, but it is difficult to argue why uploading the file to ReDigi is necessary for utilizing the digital good (Glatthaar, 2012, p. 18f).

ReDigi did not prevail in court. In late March 2013, Judge Richard Sullivan ruled that ReDigi's business model is not protected by the First Sale Doctrine. The technical process involves producing a new file on ReDigi's servers which infringes Capitol Record's reproduction rights. This decision shows that it is still a long way to go until the establishment of secondary markets for digital goods in the United States (Stempel and Barr, 2013). However, ReDigi seems not to abandon the field. The website is still online and they even claim to come soon to the EU[31].

In Europe, a similar case attracted attention of the software and digital goods industry. The IT corporation *Oracle* sued the German company *UsedSoft* for selling used licenses for downloaded software. Since 2003, the latter have been buying used software licenses which are not needed anymore by companies and resell them. They advertise with savings up to 30 % of the original price although buyers get the same quality as the first-time buyer[32]. While this business model works fine with software purchased on media like CDs, legal questions arise when the distribution is carried out immaterially, e.g. via downloads from the producer's website. These questions are strongly interlinked with the European equivalent of the First Sale Doctrine, the *Principle of Exhaustion*[33]. In a noteworthy decision from June 2012, the European Court of Justice ruled that trading with used software licenses is legal, even if the software was originally distributed via the internet: "[...] in the event of the resale of a user license entailing the resale of a copy of a computer program downloaded from the copyright holder's website, [...] the second acquirer of the license, as well as any subsequent acquirer of it, will be able to rely on the exhaustion of the distribution right under Article 4(2) of that directive, and

[29] Before selling the file, the pointer points to the seller's cloud locker. Afterwards, it points to the purchaser's cloud locker.

[30] § 117(a) of the Copyright Law of the United States of America, see `http://www.copyright.gov/title17/92chap1.html#117`, accessed July 30th, 2013.

[31] See `https://www.redigi.com/`, accessed July 30th, 2013.

[32] See `http://www.usedsoft.com/en/company/business-idea/`, accessed July 30th, 2013.

[33] The Principle of Exhaustion translates to *Erschöpfungsgrundsatz* in German speaking countries.

hence be regarded as lawful acquirers of a copy of a computer program [...]"[34].

As an aftermath of this decision, several jurists dealt with the question whether this ruling would hold for other digital goods as well[35]. Their findings are widely consistent: the UsedSoft ruling is not directly transferable to other digital goods because it decided on the interpretation of Directive 2009/24/EG, which is a *lex specialis* for the legal protection of computer programs. Nevertheless, it would be plausible to apply the decision's principles on other digital goods like music or e-books. The court's ruling is therefore a first step towards the extension of the principle of exhaustion to such goods.

For the sake of completeness, we want to note that the legal dispute between Oracle and UsedSoft did not end with the European Court of Justice's ruling. Currently, the Higher Regional Court of Munich[36] has to assess whether UsedSoft complies with the ruling's conditions (Bayer, 2013).

Second-Hand Marketplaces by Amazon and Apple? Presumably, Apple and Amazon are attentively monitoring the legal disputes around secondary markets for digital goods. Apparently, they think of building up own marketplaces for reselling digital goods – at least, they filed patents describing a corresponding approach. For example, here is an excerpt of Amazon's patent description: "When the user no longer desires to retain the right to access the now-used digital content, the user may move the used digital content to another user's personalized data store when permissible and the used digital content is deleted from the originating user's personalized data store"[37]. Furthermore, it seems like they want to imitate the limited durability of physical goods by restricting the number of moves between the data stores.

Amazon won approval for the patent in February 2013. As the online media portal *paidContent.org* reports, Apple filed its similar patent in March 2013 (Owen, 2013). In contrast to Amazon, Apple integrated a possibility to reward publishers if a digital good was resold. Furthermore, customers could review the list of the good's previous owners. A reason for the potential interest in such information is that previous owners could have inserted relevant notes: in case of an university textbook, they may have noted helpful information or marked important paragraphs.

ReDigi sees these recently issued patents as a signal that "the secondary market is the

[34] Judgement of the Court (Grand Chamber) in Case C-128/11, see `http://curia.europa.eu/juris/document/document.jsf?docid=124564&doclang=EN`, accessed July 30th, 2013.
[35] See e.g. Appl and Schmidt (2013), Bisset (2013) or Nopp and Hötzendorfer (2013).
[36] Oberlandesgericht München.
[37] United States Patent 8,364,595, see `http://patft.uspto.gov/netacgi/nph-Parser?patentnumber=8364595`, accessed July 30th, 2013.

future of the digital space and that there is no turning back" (ReDigi, 2013). In addition, they emphasize to reward all parties, including the copyright holders. According to ReDigi, Amazon never compensated copyright holders for sales on their second-hand marketplace for tangible goods.

As a conclusion of this section, we want to state that it should be possible for customers to resell their products. Glatthaar (2012) highlights that secondary markets with cheaper products could even be an alternative to illegal file sharing platforms for customers with a low willingness to pay. In addition, fundamental rights like the possibility to resell owned goods should not be limited by technical details like the production of temporary copies within the sales process.

4. Personal Data in the Context of E-Books

We do not have to look far in the past to see an entirely different world in terms of creation and utilization of personal data. Even during the evolvement of the internet in the 1990s, most websites were static and contained hardly any data generated by its users. This changed rapidly when interactive websites emerged, where users could publish self-generated content and interact with each other. In addition, more and more data-generating devices are connected to the internet. This development led to an exploding volume of user generated data, which also includes metadata on how consumers use services, media and devices.

In 2012, *The Boston Consulting Group* published a study on the value of our digital identity (Rose et al., 2012). They expect a growth of the global data transaction volume of stunning 45 % each year until 2015 (see Figure 4.1). BCG identifies four main drivers for this development:

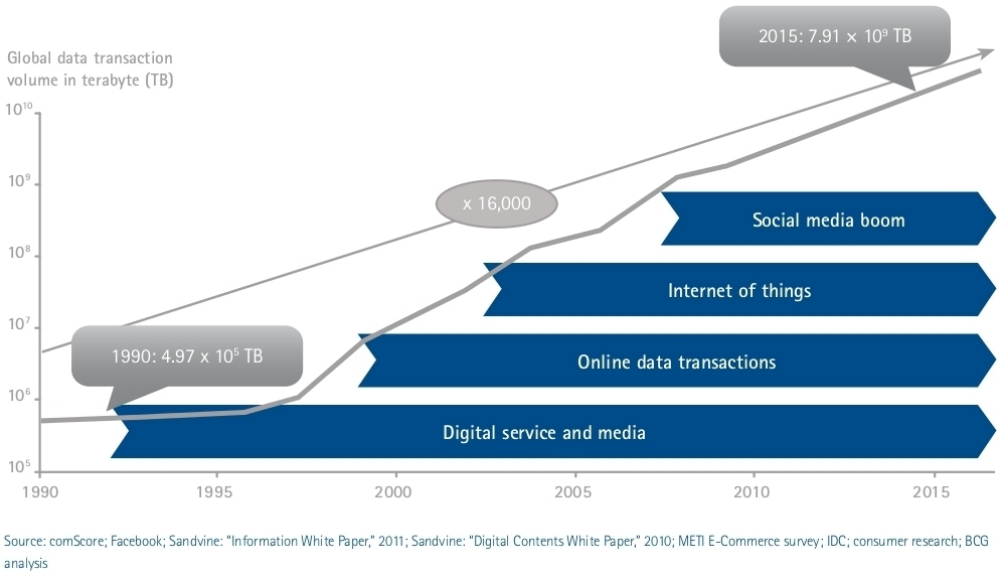

Figure 4.1.: Development of the global data transaction volume (taken from Rose et al., 2012).

- Social media boom: about 1 billion users have a Facebook profile. Many of them share a lot of information like demographic data, what they are doing, where they are and what they like. Another popular social media service is Twitter. Furthermore, LinkedIn and Xing are large networks for business contacts where people search for new professional opportunities by presenting themselves with a résumé-like profile.

- The "Internet of Things": many products of everyday life are connected to the internet or to other (wireless) networks, one just has to think of smartphones, TVs, computers and e-readers. BCG expects another 75 million connected devices until 2015 – in addition to lots of phones and PCs.

- Online data transactions: users continuously generate data by accomplishing online transactions. Examples are payments, purchases, but also logins and search queries. All these data are stored by the service providers for a wide range of potential uses.

- Digital services and media: more and better services accompanied by faster and cheaper internet connections led to a vast increase in the volume of music streams, consumption of videos and other multimedia contents. Some services are new, others replace traditional counterparts[1].

The large quantity of user generated data is very valuable for companies. Therefore, these data can be seen as a new asset class, see Section 4.1. The subsequent section discusses the capture of usage data by reading devices for e-books. Finally, Section 4.3 presents some thoughts on integrating the value of personal data into pricing schemes.

4.1. Personal Data as a New Asset Class

Politicians use spectacular phrases to emphasize the importance of personal data. The former European Consumer Commissioner Meglena Kuneva remarked in a speech: "Personal data is the new oil of the internet and the new currency of the digital world" (Kuneva, 2009). This statement is based on the fact that many internet services are financed by personalized advertisements and, subsequent thereof, on user profiles reflecting their preferences and needs. Kuneva highlights the immense possibilities for individuals which arise due to the new digital technologies, but also the need for protecting users against abuse of their personal data and giving them the chance to keep

[1] For example *Netflix*, a streaming alternative to video rental stores.

a check on their public exposure. In addition, users should be aware of the fact that they "pay" for online services with data and by consuming advertisements. According to Kuneva, this is currently not the case. Users do not know what companies do with their personal data and they have currently no chance to shed more light on this matter.

A publication by the *World Economic Forum* in collaboration with *Bain & Company* shares this view and states that giving individuals more control on how their personal data are used would be beneficial for online services and applications. Finally, personal data would "emerge as a new asset class touching all aspects of society" (World Economic Forum, 2011, p. 5).

4.1.1. Stakeholders

Several parties with diverging interests play a role within the context of the new asset class. Another study by the World Economic Forum[2] on personal data distinguishes the following stakeholders (cf. World Economic Forum, 2012):

Individuals. Although people have worries about the misuse and uncontrolled trading of their personal data, they share their data voluntarily on a large scale with providers of social networks and many other services. Hence, they provide the "raw material" of the digital economy. In addition, users are hardly informed on how their data are protected and used. Just a negligible share of users reads and understands privacy policies – they are simply too nebulous.

This group of stakeholders is not homogeneous. According to World Economic Forum (2011), the personal data consciousness differs demographically. Younger individuals generally have a higher willingness to share information on social networks, while older ones are more cautious.

Government Policy-makers. On the one hand, they have to care for a pro-business institutional framework in order to foster innovation and growth. On the other hand, individuals' privacy has to be protected by appropriate and effective laws. An agitating example for this discrepancy is the current discussion on a new data protection regulation on EU level. In January 2012, a proposal for a new regulation was published (see European Commission, 2012). The Austrian project *LobbyPlag.eu* reports that over 3,000 amendments were submitted since the proposal's presentation. LobbyPlag provides very interesting facts and figures in order to give an overview whether the amendments promote a better privacy policy or not, see Figure 4.2.

[2] In collaboration with The Boston Consulting Group.

Figure 4.2.: Amendments for a stronger or weaker privacy policy in the new European data protection regulation (Screenshot from `http://lobbyplag.eu/map/countries`, taken on August 1st, 2013).

One of the most controversially discussed points deals with enhanced control over personal data. The proposal from January 2012 included a regulation that would give users the right to explicitly decide upon the use of their data. Lobbyists try to achieve a weaker regulation, but EU Justice Commissioner Viviane Reding warned that being silent is not the same as explicitly saying "Yes" (see e.g. Kannenberg, 2013). Issues like that are still in discussion, so one cannot seriously say how the new EU regulation will look like.

Organizations. The third group of stakeholders are private organizations. Because of legal uncertainties and other issues, some of them currently do not utilize the personal data they hold. For other firms, however, personal data are at the core of their business model.

While regulators discuss legal reforms, some industry sectors try to agree on common behavior guides. For example, the *GSM Association* published a set of *Mobile Privacy Principles* which should help to promote a user-centric privacy framework for mobile systems (cf. GSMA, 2012).

4.1.2. Towards a Balanced Personal Data Ecosystem

The study "Personal Data: The Emergence of a New Asset Class" puts the current state of the personal data ecosystem in a poor light: "For many participants, the risks and liabilities exceed the economic returns. Personal privacy concerns are inadequately addressed. Regulators, advocates and corporations all grapple with complex and outdated regulations" (World Economic Forum, 2011, p. 8). In order to establish a well-

functioning digital economy, several issues have to be addressed. The following three components should guide the discussion towards a balanced personal data ecosystem (cf. World Economic Forum, 2012).

Protection and Security. Especially since cloud services became popular, personal data are usually redundantly stored at different places, even if a user gives the data to just one company. It is therefore crucial for data security that companies use reliable encryption techniques and other security measures. However, a secure environment for data cannot be established solely by technology. Human errors need to be minimized through security policies and limited access to systems.

Rights and Responsibilities for Using Data. We need a balance of rights and responsibilities for the collection and use of personal data. There are three different ways for collecting data. *Volunteered data* are provided intentionally by individuals, e.g. uploaded pictures or tweets. *Observed data* are metadata created in the course of transactions. Examples are location data from GPS receivers or a history of search terms. The third way creates *inferred data*. This term covers sophisticated methods like data mining or the deduction of preferences and needs. While users can widely control the provision of volunteered data, they usually do not know which metadata are observed and stored by companies. Inferred data are those where customers have the lowest awareness of. Modern data mining techniques can even reveal secrets[3]. Hence, customers tend to mistrust organizations which obviously collect and analyze data in an extensive way.

If we talk about rights and responsibilities, it is also important to consider the sensitiveness of personal data. Information on health and finances is usually more sensitive than data on the field of studies. The more sensitive data are, the more important are appropriate usage permissions. However, one must not ignore that even the combination of uncritical data can uncover individuals without their knowledge.

Finally, it is important for which purposes the data are used. Consumers have certain expectations about how their personal data are used. For example, they will anticipate that smartphone apps providing location-based services have to use their GPS data. Nevertheless, things are different if the app creates movement profiles for alternative commercial purposes. Doing so would breach the trust of customers.

The stakeholders have to find a balance between competing interests. For example, digital medical data can be used for a better and more efficient treatment of diseases.

[3] A popular example is the identification of pregnant women by their purchasing behavior, even if they do not buy dedicated products. Duhigg (2012) reports on this and related examples.

On the other side, the same data could harm individuals via discrimination by employers or insurance companies. In cases like this, it may not be sufficient to use anonymized data. Nowadays, cross-referencing a set of related data can de-anonymize individuals (cf. World Economic Forum, 2012, p. 20).

Accountability and Enforcement. The way of reacting to revealed breaches or misuses of data is critical for trust in the digital economy. It is not enough to "apologize for any inconvenience" or to present just weak concepts. BCG postulates in its study for the WEF that "[...] accountability requires enforcement mechanisms, if it is to be more than a hollow organizational promise. There is a need to avoid accountability concepts that sound good politically but are not enforceable in practice" (World Economic Forum, 2012, p. 21).

So which options do we have? In addition to voluntary policies, public audits[4] could help to raise confidence on how data is used in the supply chain. Tougher measures are financial penalties if guidelines are not met. For example, the new EU data protection regulation proposes fines up to 2 % of a company's annual profit[5]. Another approach brings in individuals. Users should build up a "global digital neighborhood" observing the adherence of norms of behavior.

4.2. Usage Data through Consumption of E-Books

The previous chapter covered conditions for a balanced ecosystem where personal data acts as a new asset class. Now we are revisiting the general topic of this work: e-books. In particular, the analysis focuses on usage data collected by reading devices, reading apps and online shops for e-books. As Schorre and Schafer (2011) state in the introduction of their paper on data protection, the differences between printed books and e-books lie not just in haptics and technology, but also in privacy issues.

According to our survey, many people do not seem to be aware of the fact that e-book readers usually collect data on the reading habits, see Figure 4.3. Over 40 % don't know a definite answer to this question. Together with the respondents who think reading devices do not collect usage data, over two thirds did not choose the "right" answer. If we restrict the data set to respondents who own a specific reading device for e-books,

[4] They could be similar to industry standards like ISO9000.

[5] The original proposal stipulated a fine of 5 %, which was reduced later on due to massive pressure by large companies and its lobbying organizations, see e.g. `https://www.unwatched.org/EDRigram_11.11_Wird_das_neue_Datenschutzgesetz_schlechter_als_das_alte`, accessed August 2nd, 2013.

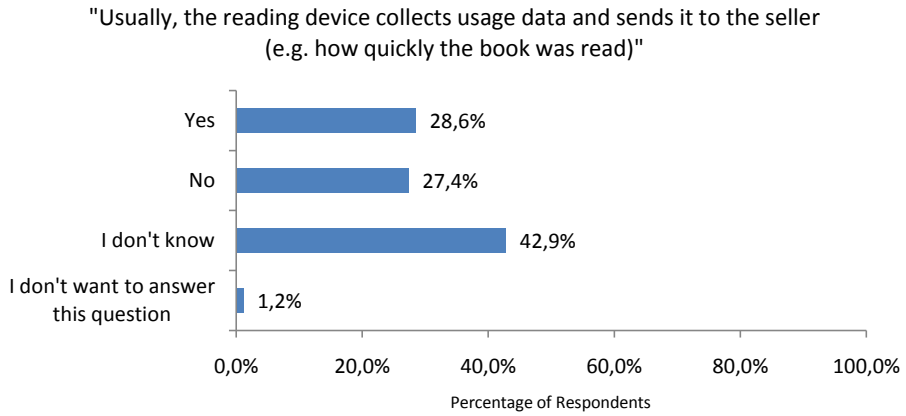

Figure 4.3.: Survey question on the collection of usage data by e-book readers.

there are still 60 % who do not know an answer or think there are no data collected. Correspondingly, 40 % know about the collection of usage data.

4.2.1. Potential Features of E-Readers

Modern "electronic paper" displays widely provide the appearance of printed pages. However, a view under the hood of e-readers reveals that such devices collect a wide range of usage data. Using the categorization of the previous section, which classifies data into *volunteered data*, *observed data* and *inferred data*, we will see that data are collected both voluntary[6] and by observation[7]. It remains unclear to what extent retailers and publishers infer additional data, but they actively promote the range of new features which can be used for an enriched reading experience. The paragraphs below give an overview on potential features of e-readers (cf. Schorre and Schafer, 2011).

Reading Habits. Almost all online shops are able to track and analyze the buying habits of customers, which reveals valuable information for sellers. Of course, the same holds for e-books, but tracking does not stop when the sales procedure is completed. Additionally, retailers are able to collect data on the *reading habits*. From time to time, newspapers cover this topic in a scary manner: "Your e-reader knows how long it took you to finish A Game of Thrones, where you stopped reading Wolf Hall, how many pages of Fifty Shades of Grey you read an hour. It knows what you've highlighted or bookmarked [...]" (Flood, 2012). As this citation suggests, the technical possibilities

[6] e.g. bookmarks, comments, posts in social networks.
[7] e.g. read pages per hour, favorite genres, data on reading breaks.

Figure 4.4.: "Track your Stats with Reading Life" (Screenshot from `http://www.kobo.com/readinglife#trackYourStats`, taken on August 3rd, 2013).

for collecting data are manifold. Retailers can levy information about the duration of reading a certain part of a book at which point in time. By aggregating data, even more information can be derived, e.g. if a user's speed of reading is below or above average. Many e-book retailers advertise with providing statistics on the reading habits, for example *Kobo*. Their feature *Reading Life* reveals data on the users' prime reading time (see Figure 4.4), his or her share of read books in the Kobo library or the average number of pages per reading session.

Many of the mentioned functions would not require to send information back to the retailer. For example, it would be sufficient to store bookmarks and comments just locally on the e-reader. The justification for sharing all the data with the retailer lies in another feature: reading on different devices. It is convenient to read e-books across several devices without having to search for the furthest page read. Amazon describes its corresponding technology *Whispersync* as follows: "Whispersync synchronizes the bookmarks and furthest page read among devices registered to the same account. Whispersync is on by default to ensure a seamless reading experience for a book read across multiple Kindles"[8]. It is save to presume that most users will not change this standard setting. Hence, a tremendous amount of usage data is regularly transferred to Amazon.

Bookmarks, Comments and Highlighted Text. These data are volunteered, but not necessarily intended for sharing with others. Bookmarks are used for relocating specific passages in the text. Usually, a bookmark denotes that the user interrupted reading for some reason. For publishers and retailers, it could therefore be interesting how often and at which passages bookmarks are set by readers.

Most e-book reading devices are capable of storing comments. These could also be

[8]Excerpt from Amazon's webpage "Wireless, Whispernet and Whispersync", see `http://www.amazon.com/gp/help/customer/display.html?nodeId=200375890`, accessed August 4th, 2013.

valuable for publishers. Taking comments in university textbooks as an example, publishers could use text mining algorithms for finding passages which are difficult to understand for many students. As a follow-up, authors could rewrite them for the next edition.

Another function is highlighting of text passages. Users do this if they find it interesting or remarkable for some reason. By aggregating such data, it turns out that *The Holy Bible* is currently the most highlighted book of all time and the sentence "Because sometimes things happen to people and they're not equipped to deal with them" in the second book of the *Hunger Games* by Suzanne Collins is the most highlighted single passage. It was marked by nearly 18,000 Kindle users. Furthermore, information on "recent highlighting trends" is available[9].

Reviews and Social Networks. Of course, the features of e-book reading devices also include reading and composing reviews as well as an integration in social networks. Reviews and ratings are not a unique feature of e-books, they have been very popular for years in online stores for printed books. However, linking data allows for additional conclusions. Retailers could assess the significance of reviews by including usage data. Did the reviewer actually read the book and if yes, how fast?

The social network boom does not stop at e-books and the corresponding reading devices. Users can share what the read and which authors they like. This ends up in "social reading" where (virtual) friends see what a user is currently reading, where readers discuss chapters and share recommendations. Kobo takes this to extremes: readers can earn "awards" by linking their account to Facebook, by reading a certain amount of books or by reading at midnight – this results in the "Witching Hour" award[10].

While readers may find some of the presented features useful, they are questionable in terms of privacy. In addition to the problems with "anonymous" profiling, Schorre and Schafer (2011) emphasize the issue with identification systems like *Adobe ID*, which are used in DRM systems. With such systems, users are identifiable and the collection of usage data may conflict with laws like the German right of *informational self-determination*. The authors further demand more and better understandable information on the utilization of readers' personal data.

[9] Information taken from Amazon's webpage `https://kindle.amazon.com/most_popular`, accessed August 5th, 2013.

[10] Information taken from Kobo's webpage `http://www.kobo.com/readinglife#earnAwards`, accessed August 5th, 2013.

4.2.2. What do Privacy Policies Reveal?

The last section showed that e-readers collect lots of usage data for the purpose of additional features which should enrich the reading experience. But what else could retailers do with the data? Every year since 2009, the *Electronic Frontier Foundation* tries to shed light on such questions by publishing its *E-Book Buyer's Guide to Privacy* (Cohn and Higgins, 2012). In this guide, the EFF analyzes privacy policies of popular e-book platforms. They find that the answers to frequently asked questions on privacy are usually "frustratingly vague and long-winded". In nearly any case, reading e-books implies giving up some privacy. The paragraphs below quote the EFF's questions and summarize their findings[11].

"Can they keep track of searches for books?" For *Google Books*, *Kobo*, *Sony* and *Amazon Kindle*, the answer is Yes. These platforms collect information on searches, at least if the user is logged in. For *Barnes & Noble Nook*, the answer is partially unclear. While they do log data on searches, their privacy policy does not indicate whether they associate the data with a user's account. The less known services *OverDrive*[12], *Internet Archive*[13] and *Adobe Content Server*[14] seem not to be capable of monitoring book searches.

"Can they monitor what you're reading and how you're reading it after purchase and link that information back to you? Can they do that when the e-book is obtained elsewhere?" The answer is never an unrestricted Yes, but for *Google Books*, *Kobo* and *Amazon Kindle* it is clear that they log viewed pages, annotations and highlightings. As they advertise with additional features related to such data (see section above), they definitely make use of these possibilities. The privacy policies of *Barnes & Noble Nook* and *Sony* are not very informative, but presumably B&N stores the last opened page. Free e-books obtained via *Internet Archive* are not subject to the collection of user-specific information[15]. The *Adobe Content Server* also does not monitor reading.

[11] The complete e-reader privacy chart (2012 edition) including the cited questions can be found on EFF's website, see `https://www.eff.org/pages/reader-privacy-chart-2012`, accessed August 5th, 2013.

[12] An e-book distributor working together with libraries, schools and retailers, see `http://www.overdrive.com/`.

[13] A digital library of free e-books and other media, see `http://archive.org/index.php`.

[14] A software which adds Digital Rights Management to e-books and works together with the distribution platform Adobe Digital Editions, see `http://www.adobe.com/de/products/contentserver/`.

[15] However, it is unclear what happens if a user uploads the free e-book to his or her Kindle account.

"What compatibility does the device have with books not purchased from an associated eBook store?" This is primarily a question of supported formats. For example, *Amazon Kindle* distributes e-books using the proprietary AZW format, which cannot be read via other platforms except *OverDrive*. In contrary, Kindle users cannot read e-books using the open format ePub, while the other platforms do support it. Almost all platforms support established formats like TXT or PDF, but devices using an electronic ink technology may not display graphics properly.

"Do they keep a record of book purchases? Can they track book purchases or acquisitions made from other sources?" Most sellers require that purchases are made from a logged-in account. In general, they track purchases from their own bookstore. For *Amazon Kindle* and *Kobo*, it is unclear whether they track purchases from other stores or not. *Sony* refrains from tracking such content.

"With whom can they share the information collected in non-aggregated form?" *Google Books*, *Amazon Kindle*, *Barnes & Noble Nook*, and *Sony* state in their privacy policies to share non-aggregated information with law enforcement, civil litigants and of course their own services. B&N, Kobo and Sony also list third parties and publishers of newspapers[16]. The other platforms do not share personally identifiable data or are not capable of collecting them.

"Do they have mechanisms for customers to access, correct, or delete the information?" This question deals with the demand for extended control discussed above. At this point, *Kobo* collects bonus points as this platform allows users to access, correct and change personal information at any point in time. For the other platforms which are able to collect information, EFF's conclusion is "Somewhat". *Amazon Kindle*, for example, lets users alter the information but they store prior versions. *Barnes & Noble Nook* and *Sony* do not allow users to delete search and purchase information.

"Can they share information outside the company without the customer's consent?" *Internet Archive* and *Adobe Content Server* do not collect any data, therefore they cannot share it outside the company. Users of *Google Books* are protected by default as they have to opt-in for allowing Google to share information with other parties. On the other hand, users of *Amazon Kindle* and *Barnes & Noble Nook* just have the option to opt-out for certain promotional and marketing purposes. Furthermore, *Sony* users have

[16] In case of B&N only if the user subscribed to the corresponding magazine or newspaper.

either an opt-in or an opt-out option in order to refuse sharing information collected in their bookstore.

4.3. The Value of Usage Data and its Influence on Pricing

Jim Hilt is Barnes & Noble's vice president of e-books. In an article by *The Wall Street Journal* from July 2012 he states that the company is starting to share insights from analyzing usage data with publishers in order to help them "create books that better hold people's attention" (Alter, 2012). According to Mr. Hilt, Barnes & Noble was 2012 just in "the earliest stages of deep analytics", but publishers are interested in data like the identification of text passages where readers usually get bored and tend to stop reading. Presumably, publishers and retailers could increase their sales through such data-driven "book optimization".

It seems like many e-book readers are happy with the status quo. They are sharing personal data in exchange for additional services. For example, a user comment beneath an article dealing with data collection by e-readers states that he or she uses the synchronization service because it is convenient. As it is not necessary to remember the last page when continuing to read on another device, he or she is willing to pay this service with personal data[17].

But what would be the case if customers had the option to "buy" or "sell" their privacy? What if companies would not store any usage data by default while offering customers a discount in exchange for providing these data? In the context of e-books, this would simply mean that single books have a lower price or rental fee. However, it is not easy to answer such questions. The following paragraphs discuss related issues.

4.3.1. Personal Data Ownership

The discussion about trading with personal data should start with a seemingly simple question: who owns the data? Intuitively, one would most likely assume that personal data are owned by the respective individuals. But what about observed data like a list of viewed items in an online store or even inferred data like the average time period needed by users to finish an e-book? Bain & Company concludes in its study for the WEF that there is no one-size-fits-all approach for assigning ownership of personal data.

[17] The original comment in German is: "Ich nutze den Sync jedoch aus Bequemlichkeit. So kann ich Bücher direkt nach dem Kindle auf meinem iPad oder iPhone weiter lesen ohne das ich mir merken muss, wo ich doch war. Dieser (sic) Service zahle ich gerne mit den Daten über meinen Lesestand", see `https://netzpolitik.org/2012/ebook-lesen-oder-gelesen-werden/#comment-468164`, accessed August 5th, 2013.

They suggest to define different classes of information and to protect them according to their sensitivity (World Economic Forum, 2011).

BCG argues in another study for the WEF that several parties are involved in the creation of data about an individual (World Economic Forum, 2012). These parties accordingly have rights and responsibilities. However, these rights are usually not exclusive. This leads to the statement that, in most cases, no one has complete control over the data. The authors compare the situation to that of musicians. Although they composed e.g. a song and its lyrics, they usually have to share the rights on it with music labels and retailers[18].

It is also remarkable that companies actively sell and buy personal data in exchange for money, while customers usually provide their data in exchange for services or even voluntarily. Generally, this includes giving up at least some rights on the provided information. Nevertheless, figures about the personal data business are impressive. While traditional businesses stagnated or even lost revenues between 2008 and 2011, data-driven businesses like Web 2.0 communities skyrocketed with a growth of 100 % within that period of time (World Economic Forum, 2012).

4.3.2. How Do Customers Value Privacy and Personal Data?

If personal data are traded between companies, they have an accurate market price. The recent OECD study "Exploring the Economics of Personal Data" (OECD, 2013) presents some corresponding figures. For example, one could derive valuations of a single user's data set based on a company's market capitalization. According to this method, a Facebook profile was valued between 40 and 300 US Dollars within the time period from 2006 to 2012. Interestingly, the annual revenues per profile just range between 4 and 7 US Dollars. The OECD also presents current market prices for personal data items in the United States[19]. Accordingly, a date of birth costs USD 2, an individual's employment history USD 13 and a social security number USD 8.

But how do individuals value their personal data? As already mentioned, the exchange of personal data between companies and individuals usually does not involve payments. Instead, companies provide services free of charge. However, one way for examining these individual valuations are economic experiments and surveys. According to the OECD, research in this field is still at an early stage, but there are two general messages (OECD, 2013, p. 5):

[18] We think it is important to annotate the difference that musicians will most likely negotiate their contract with the labels, while providers of personal data have to accept terms and conditions.

[19] They use figures from various online data warehouses like Aristotle, Experian or Merlin Data.

- People are heterogeneous in their valuation of personal data. In other words, people quote different prices if they are asked to sell a specific personal data set. Their individual valuation of privacy is heterogeneous as well.
- Empirical studies find that valuations of both privacy and personal data are extremely sensitive to contextual effects. Hence, privacy preferences cannot be determined precisely – most likely, individuals simply do not have definite valuations of privacy. For example, Acquisti et al. (2009) find that such valuations are highly influenced by non-normative effects, i.e. factors which actually should not affect decision making.

Bounded Rationality. Acquisti et al. (2009) question individuals' ability to make rational decisions on privacy issues. Especially online, we continuously make decisions which affect our privacy. For example, registering for a service often involves revealing an e-mail address and other personal data. In the offline world, joining a grocery loyalty program involves the decision whether we are willing to enjoy discounts in exchange for being tracked. The authors ran several experiments within this context and found that individuals tend to make inconsistent decisions.

Valuation of Facebook Profiles. Spiekermann et al. (2012) investigated on how Facebook users value their personal information. In an survey-based experiment, they set up a hypothetical scenario where Facebook's founder Mark Zuckerberg announces to close down the service. Users have the option to offer him money in exchange for preventing their personal data[20] from being deleted. The advantage of this setting is that participants have to decide on information which is already revealed, while previous studies usually analyzed the situation at the moment of revelation.

The authors' main findings are that both *asset consciousness* and the *psychology of ownership* heavily influence the users' valuation of personal data. The former term stands for "a person's awareness of owning something valuable for which there is a market; in our case, asset consciousness involved being aware of owning a Facebook profile that is desired by a data marketer" (Spiekermann et al., 2012, p. 4). The experiments demonstrated that if individuals learn about the existence of markets for their personal information, they value it 3.4 times higher than others who did not learn about these markets.

Psychology of ownership is about the possessive feelings of individuals. It answers the question "What do I feel is mine?" and has to be distinguished from legal ownership as

[20]This includes friends, posts, pictures etc.

people could feel that something belongs to them, even if they do not own it in legal terms (Pierce and Jussila, 2011, p. 16). Spiekermann et al. (2012) showed that Facebook users develop ownership feelings for their profiles. For the valuation of personal information, this concept seems to be much more important than privacy considerations.

4.3.3. Influence on E-Book Pricing

The sections above discussed the valuation of personal data. But how do customers value usage data generated by reading e-books and could that influence e-book prices? Again, one cannot clearly assign ownership. Besides comments and interactions with social networks, users create the data just in a passive way[21]. Retailers are involved as well by capturing and storing the data. Both parties have associated rights and responsibilities concerning the data.

Our survey showed that most of the respondents are not aware of the collection of usage data, see Figure 4.3. Hence, they are not able to consider this issue for determining their willingness to pay. Let us assume that people have a higher awareness about the collection of usage data and that they learn about their data's value for publishers. In that case, users could develop *asset consciousness* regarding their data. In accordance to the Facebook study presented above, this would most likely raise their valuation.

Referring to the concept of *psychology of ownership*, we do not think that people would develop possessive feelings for most of their usage data. In contrast to "emotional data" like pictures or likes on Facebook, a large share of e-book usage data are merely statistics. However, people could feel that comments stored in the e-book or related posts on social networks belong to them.

It is not easy to assess the role of privacy within this context. The Facebook study showed that privacy considerations do not heavily influence the valuation of personal data. However, the surveyed sample hardly posts sensitive information on Facebook (Spiekermann et al., 2012, p. 14). In contrast, readers of e-books may provide information on sensitive subjects like health or sexuality, as Alter (2012) points out in her article for *The Wall Street Journal*.

Usage Data and the Willingness to Pay. We asked our sample whether they would be willing to provide usage data in exchange for a discount of 5 to 10 percent. As Figure 4.5 depicts, it turned out that over one fourth would accept such a deal, while the others would not provide their data for this price. Hence, most respondents seem to value

[21] For example, if they stop reading, the device automatically stores the last viewed page.

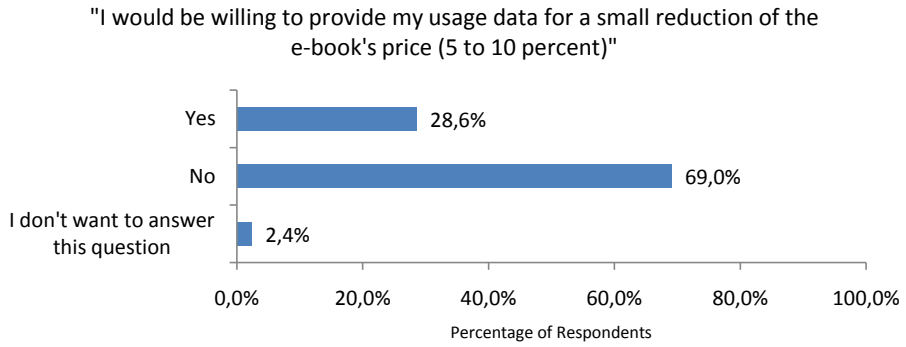

Figure 4.5.: Survey question on the willingness to provide usage data.

privacy *higher* than 5 to 10 percent of the e-book's price. This question is related to the *willingness to accept (WTA)*, which can be explained as "the lowest price a person would be willing to accept to part with a good (protection of her personal data) she initially owned" (Acquisti et al., 2009, p. 9).

In their study "What Is Privacy Worth?", Acquisti et al. found evidence supporting the hypothesis: "The fraction of consumers who will reject an offer to obtain money in exchange for reduced privacy (WTA) is larger than the fraction of consumers who will accept an economically equivalent offer to pay money in exchange for increased privacy (WTP)" (Acquisti et al., 2009, p. 14). We tried to reproduce their findings by examining the *willingness to pay (WTP)* a small premium, again 5 to 10 percent, in exchange for the avoidance of collecting usage data.

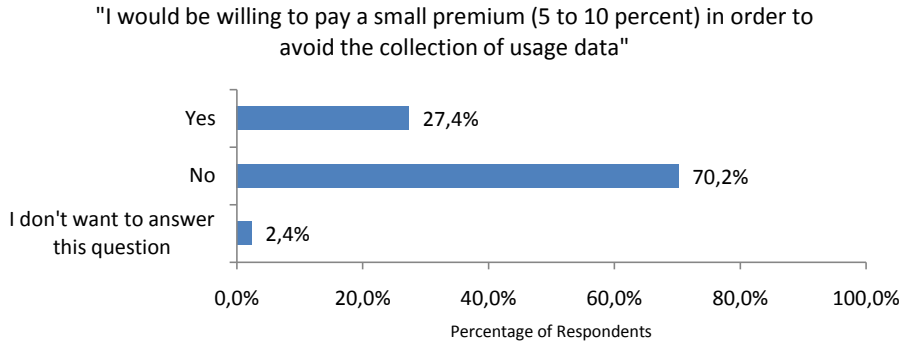

Figure 4.6.: Survey question on the willingness to pay for more privacy.

Over two thirds of the respondents would not be willing to pay the premium in exchange for more privacy, see Figure 4.6. Hence, they seem to value privacy *lower* than 5 to 10 percent of the e-book's price, which is inconsistent with the outcome above and

is therefore in accordance with the findings by Acquisti et al.

This inconsistency is often explained with the psychological phenonemon of *loss aversion*: individuals tend to overweigh losses relative to gains (Kahneman and Tversky, 1979). In case of Figure 4.5, most respondents would not accept the monetary gain because this would result in a loss of privacy. On the other hand, it follows from Figure 4.6 that the majority would not accept losing money although there would be a gain in privacy (cf. Acquisti et al., 2009, p. 9).

Options for E-Book Pricing. Although the survey results on WTA and WTP are inconsistent, they do not disprove that some individuals are willing to pay for more privacy. A closer look on the survey's data reveals that about 40 % selected the answer "No" in both questions, which is inconsistent. However, all of the respondents who would accept the discount in exchange for usage data (almost 29 %) would not pay the premium for avoidance. These answers are consistent and reveal that the respective respondents do not mind providing their usage data. Conversely, all of the respondents who are willing to pay a premium for more privacy (about 27 %) would not provide their data in exchange for the discount. These answers are consistent as well, showing that the respective respondents do care about their usage data.

In addition, other factors like asset consciousness could justify alternative approaches of e-book pricing. An option would be to build up an e-bookstore where consumers pay slightly more for e-books, but have the guarantee to enjoy "private reading". This should be realized with open source e-readers in order to ensure credibility[22]. However, such a bookstore would most likely be a niche product. Many people are simply not concerned about privacy or see the provision of usage data as a fair "payment" for additional services like synchronization and "social reading".

Of course, the established retailers like Amazon or Barnes & Noble could offer such a "private reading" option as well. Indeed, it is possible to deactivate synchronization on their e-readers. Nevertheless, no one can be sure that turning off such features really inhibits the collection of usage data.

[22] Using an open source operating system for e-readers respectively open source reading software for other devices like tablets would give independent developers the chance to verify that the software does not collect any usage data.

5. Conclusion

The present thesis tried to give an comprehensive overview on implications, challenges and opportunities in the context of electronic markets for e-books. In the United States and in England, e-books have market shares between 15 and 25 percent. Continental Europe lags behind, but the growth rates are impressive. These facts underline the relevance of a corresponding economic analysis.

E-books can be classified as digital goods. At least to some extent, such goods are non-rival and non-excludable. Hence, they have similar properties to traditional public goods, which leads to free-riding behavior – in this context, this is another word for piracy. However, there are several reasons why markets for e-books do work, although standard economic theory would predict an unsustainable equilibrium price of almost zero. One of these reasons is that closed ecosystems for selling e-books have extremely low transaction costs, another one is the enforcement of copyright laws via technical measures like Digital Rights Management (DRM).

Markets for e-books are still developing – not just in terms of sales figures, but also in their institutional frameworks. In many European countries, e-books are not treated like printed books as they are not subject to a reduced VAT. Nevertheless, the small country Luxembourg taxes printed books as well as e-books with just 3 %. Therefore, the major global e-book sellers operate from this country, but this competitive advantage is going to vanish in 2015 when the VAT will be charged according to the state where the customer comes from.

Another development in the context of markets for e-books is the discussion of secondary markets. 40 % of our survey's respondents think that they own their e-books in legal terms, and about 30 % believe it is possible to resell them. In fact, both does not apply. Customers do not own the e-book itself, but only a license for reading it. The license does not allow them to resell e-books or to give them away. Furthermore, copyright laws usually contain regulations like the European *Principle of Exhaustion*, which allows customers to resell their purchased products – but such laws are currently not applicable to digital goods. In 2012, the European Court of Justice ruled that re-selling downloaded software is legal, but this ruling is not directly transferable to other

digital goods. Nevertheless, Amazon and Apple filed patents for digital second-hand marketplaces, so they may consider building them up if laws change.

Finally, this work dealt with personal data in general and with the collection of usage data in particular. Less than 30 % of the survey's respondents know that e-readers usually collect data on reading habits, bookmarks, comments and highlighted text. These data give publishers and retailers the possibility to offer additional features like synchronization, but also to "optimize" books by aggregating and analyzing the data. For example, they could identify passages where people usually get bored and stop reading. Besides the question whether we endorse such optimizations, we should emphasize the fact that customers provide these data voluntarily, most of them even without being aware of it. However, personal data are already referred to as the "currency of the digital world", so people should be conscious of their data's value. Our survey revealed that 40 % of the respondents answered the questions on the valuation of personal data inconsistently, which is known as *loss aversion*. Another 27 % seem to care about their usage data as they would pay a small premium for avoiding the collection, so there could be the need for a open-source marketplace for e-books which does not collect any data.

For future work in this context, it would be helpful to conduct a more comprehensive and representative survey in order to determine the accurate willingness to pay and other factors. For example, it would be interesting to find out which data are perceived as sensitive by customers. It remains to state that digital goods already play a very important role in our economy. Hence, they are an interesting and promising field of research.

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A. Documentation of the Survey

This survey was conducted between July 26th, 2013 and August 5th, 2013. In total, 84 respondents completed the questionnaire, which was spread via e-mail and Facebook posts. They were asked to answer the questions spontaneously. Thus, it took the respondents just between 45 seconds and 5 minutes to complete the survey, most of them needed less than 2 minutes. The majority of the respondents is between 20 and 30 years old and lives in Austria. The share of university students is, compared to the population, above average. For conducting the survey, we used an online tool provided by the Austrian National Union of Students[1].

Questions and Results. Table A.1 lists the English version of the survey's questions and the aggregated answers. Please note that question A4 was only presented to respondents who have chosen the answer "Yes" in question A3. Hence, there are just 24 answers to question A4. The answer "I don't know" was not available for the questions in section A as well as for C2 and C3. Therefore, the corresponding cells do not contain any number.

Table A.2 lists the German version of the survey's questions. The ID links them to the English version and the results presented in Table A.1.

[1] ÖH WUmfrage, see `http://umfrage.oeh-wu.at/`.

Questions		***Answers and Quantities (n=84)***			
ID	*Text*	*Yes*	*No*	*I don't know*	*I don't want to answer this question*
A1	I am the owner of a specific reading device for e-books (e.g. Kindle, Nook)	20	63	n/a	1
A2	I used free e-books within the last 12 months (for reading or just as a reference book)	44	38	n/a	2
A3	I bought e-books within the last 12 months	24	59	n/a	1
A4	Within the last 12 months, I spent more money on e-books than on printed books *)	10	14	n/a	0
B1	After purchasing an e-book, I am its owner in legal terms	34	20	30	0
B2	If I want, I can sell my e-book or give it away as long as I do not keep a copy	25	26	33	0
B3	After downloading an e-book to the reading device, the seller is still able to access it (e.g. deleting the e-book from the device if the user violated the terms and conditions)	23	33	28	0
C1	Usually, the reading device collects usage data and sends it to the seller (e.g. how quickly the book was read)	24	23	36	1
C2	I would be willing to provide my usage data for a small reduction of the e-book's price (5 to 10 percent)	24	58	n/a	2
C3	I would be willing to pay a small premium (5 to 10 percent) in order to avoid the collection of usage data	23	59	n/a	2

Table A.1.: Overview on the survey's questions and results.

Questions	
ID	*Text*
A1	Ich besitze ein spezielles Lesegerät für E-Books (z.B. Kindle, Oyo, Tolino)
A2	Ich habe in den letzten 12 Monaten kostenlose E-Books verwendet (zum Lesen oder auch nur als Nachschlagewerk)
A3	Ich habe in den letzten 12 Monaten E-Books gekauft
A4	Dabei habe ich mehr Geld für E-Books als für gedruckte Bücher ausgegeben
B1	Mit dem Kauf eines E-Books werde ich dessen Eigentümer im rechtlichen Sinn
B2	Bei Bedarf kann ich mein E-Book verkaufen oder verschenken, sofern ich keine Kopie davon behalte
B3	Nach dem Herunterladen eines E-Books auf das Lesegerät kann der Anbieter nach wie vor darauf zugreifen (z.B. die Löschung des E-Books veranlassen, falls gegen die Nutzungsbedingungen verstoßen wurde)
C1	Üblicherweise werden beim Lesen von E-Books Nutzungsdaten erhoben und an den Anbieter gesendet (z.B. wie schnell das Buch gelesen wurde)
C2	Ich wäre bereit, meine Nutzungsdaten gegen eine geringe Reduktion des E-Book-Kaufpreises (5 bis 10 Prozent) zur Verfügung zu stellen
C3	Ich wäre bereit, beim Kauf von E-Books einen geringen Aufpreis (5 bis 10 Prozent) zu bezahlen, um die Erhebung von Nutzungsdaten zu verhindern

Table A.2.: German version of the survey's questions.