



Exploring the economic value of personal information from firms' financial statements



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ARTICLE INFO

Article history:

Available online 25 January 2014

Keywords:

Personal information
Valuation of firm
Intangible asset
Online business model

ABSTRACT

Currently personal data gathering in online markets is done on a far larger scale and much cheaper and faster than ever before. Within this scenario, a number of highly relevant companies for whom personal data is the key factor of production have emerged. However, up to now, the corresponding economic analysis has been restricted primarily to a qualitative perspective linked to privacy issues. Precisely, this paper seeks to shed light on the quantitative perspective, approximating the value of personal information for those companies that base their business model on this new type of asset. In the absence of any systematic research or methodology on the subject, an ad hoc procedure is developed in this paper. It starts with the examination of the accounts of a number of key players in online markets. This inspection first aims to determine whether the value of personal information databases is somehow reflected in the firms' books, and second to define performance measures able to capture this value. After discussing the strengths and weaknesses of possible approaches, the method that performs best under several criteria (revenue per data record) is selected. From here, an estimation of the net present value of personal data is derived, as well as a slight digression into regional differences in the economic value of personal information.

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1. Introduction

Since marketing techniques initially made the importance of client-focused strategies clear, companies have been collecting customer data and using them to create value. When there was *just a real world*, those data were difficult to collect and were stored inside the firm “as the miser watches over his hoarded gold” (Douplitzky, 2009). The Internet, or rather information and communication technologies (ICTs) have radically changed this situation. Currently, data gathering is done on a far larger scale and much cheaper and faster than ever before. While we communicate, exchange and access information using electronic communications systems, data records can be and are collected on who we are, where we are, what we do, and how we do it. Even more significant, personal

data¹ are easily shared or transferred across companies, markets and industries, irrespective of geographical boundaries.

Arguably, the most striking feature of this scenario is the emergence of a particular type of company for whom personal data are the key factor of production. The business models of quite a number of companies operating in online markets – including many of the Internet giants – are based on targeted advertising, which in turn relies on behavioural profiling. Personal data are thus becoming one of the main assets of many modern markets, to the point that they can be considered “the new oil of the internet and the new currency of the digital world” (Kuneva, 2009).

¹ In this paper the terms “personal data” and “personal information” are used synonymously. For both, we assume the definition of the term according to the OECD Privacy Guidelines: “Any information relating to an identified or identifiable individual (data subject)”. Typical examples of personal data include, for instance, name and address information, social security, health or other unique identifying numbers, health records and financial information. However, these days, techniques can often enable data relating to search terms, websites visited, GPS positions, and IP addresses, to be linked back to an identifiable individual. Thus, the paper assumes a broad understanding of personal information, but does not attempt a clear delineation from non-personal information.

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Surprisingly, this type of statement is still based largely on theoretical grounds. Few would deny that personal information generates value for companies but, at the same time, almost no academic paper can be produced to help estimate how large this value is. Until now, the economic analysis of personal information has been conducted from a qualitative perspective, mainly linked to privacy issues (a review of the economic literature on information privacy can be found in [Pavlou, 2011](#)). However, there is a pressing need to progress from those qualitative statements to quantitative results. This is not least because some of the main data collectors are traded on stock markets and are quickly ascending the list of the biggest world companies.

This article seeks to shed light on this topic, trying to approximate the value of personal information for companies, in particular for those companies that make their business precisely through the handling of personal information. In the absence of any systematic research or methodology on the subject of study, an ad hoc procedure has been developed. The accounts of a number of key players in online markets have been examined. This inspection has tried first to determine whether the value of personal information databases is somehow reflected in firms' books, and second to define performance measures able to capture – alternatively or complementarily – this value. After discussing the strengths and weaknesses of these possible approaches to valuing personal data, both from a conceptual and practical (obtaining the figures for key players) perspective, the method that performs best is selected. Taking those values as a departure point, and after further processing, an estimation of the value of personal data is derived.

Along these lines, the article is structured as follows. After this brief introduction, the next section introduces the complexities involved in the valuation of personal data. The use of company reporting for the valuation of personal data, both from a theoretical and practical perspective, is analyzed in detail in the following section. From this discussion, the results obtained through the different possible methods employed are displayed, as well as discussed in terms of their different merits. Finally, the paper closes with the calculation on the net present value of personal information, a brief investigation of regional differences and some conclusions on the relevance and applicability of the valuations obtained in the paper.

2. Background – the difficulties to value personal data

Regardless of the purpose for which it has been collected, personal data that a firm holds are one of the intangible assets it administers. Therefore, at a conceptual level and in principle, the problems arising when trying to give personal data a value are the same as for any other intangible assets: mainly that the requirements for reporting them are few and often imprecise ([Cohen, 2005](#); [Hunter, Webster, & Wyatt, 2012](#)) and, when existing, place limits on the managements' ability to record them,² given the uncertainty associated with payoffs from the assets and information asymmetry surrounding managements incentives ([Wyatt, 2005](#); [Grosu et al., 2011](#)). “Even worse, much of the information that is provided is partial, inconsistent, and confusing, leading to significant costs to companies, to investors, and to society as a whole” ([Lev, 2003](#)).

Such problems and concerns have frequently led analysts to look at stock markets as an independent valuation source that provides “seemingly objective assessments of a firm's intangible assets” ([Whitwell, Lukas, & Hill, 2007](#)). Intangible assets are

one of the possible contributors to the disparity between market and book values of companies ([Hulten & Hao, 2008](#)). Therefore, market capitalization should somehow reflect the value of intangible assets. Following this reasoning, researchers and stock analysts have poured their efforts into evaluating how intangible capital shows up in the valuation of the firm without agreeing on the pre-eminence of any specific methodology. Such a task is not easy to achieve. [Gu and Wang \(2005\)](#) state that high information complexity of intangible assets increases the difficulty for analysts to assimilate information and they find that forecasting errors are greater for firms with diverse and innovative technologies. Market bubbles and volatility can also lead to mistakes or dubious outcomes ([Bond & Cummins, 2000](#)).

Among the various intangible assets, the link between R&D investments and market value has been a major focus of research and there are many studies following this avenue for research, from [Griliches \(1981\)](#) to [Hall and Oriani \(2006\)](#), [Ehie and Olibe \(2010\)](#) or [Palmon and Yezegel \(2012\)](#). In terms of customer value, the number of studies that have addressed the topic is much smaller ([Berger et al., 2006](#); [Gupta & Zeithaml, 2006](#); [Kumar & Shah, 2009](#); [Schulze, Skiera, & Wiesel, 2012](#)). All these articles study how customer equity (the total combined customer lifetime values of all of a firm's customers) contributes to market value. Note that customer equity is derived from the role of clients as present and future buyers of products and/or services from the firm. To the best of our knowledge, only one previous and very recent work has valued clients in their role of “personal data donors”. [Cauwels and Sornette \(2012\)](#) derive a valuation of Facebook and Groupon from the evolution of three scenarios for their customer base. Apart from this work, there are no studies that value personal data as an independent category of intangible assets and it can be asserted that the work of valuing personal data is by and large still to be done.

From both an academic and economic perspective, this is not an acceptable situation as a growing number of companies rely on business models that are largely dependent on the use of personal information ([Gómez-Barroso & Feijóo, 2013](#)). For those companies, personal records databases can – should – become visible in book accounts. Acknowledging the problems exposed at the beginning of this section, this is unquestionably a first immediate way to look at the value of personal data. The “market way” is also valid: regardless of decisions made by accountants, the market approach can be used in the same manner as it is used for any intangible asset. The next section explores both paths – not necessarily confronted³ – presenting a number of options for approximating the monetary value of personal data. As will be discussed later, each of the options presented potentially suffers from certain methodological biases and measurement errors. The approximations obtained are therefore not directly comparable; that is, they may complement each other rather than being substitutes. Yet, put in context and seen altogether, they can still serve as an initial basis for expanding the overall understanding of the economics of personal data.

3. Method – valuation of personal information based on company reporting

Below, six different approaches to deriving a valuation of personal information are analyzed. The analysis is undertaken with regard to those companies that ground their business entirely or to a major extent on the commercial use of personal data. In particular, the empirical part focuses in detail on five companies: Experian, Facebook, Google, LinkedIn, and Xing, although the preferred method is later extended to five additional companies in [Appendix](#)

² For instance, goodwill is permitted by most accounting standards to be recognized as an asset when it is acquired as part of another business, but this is not the case when it is internally generated.

³ [Choi et al. \(2000\)](#) state that the financial market positively values reported intangible assets.

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