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Sharing Economy:
Exploring social media and bibliometric evidence

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Abstract

The current structural changes in the world economy have led to the emergence and rapid proliferation of a new economic model whose individuals share assets owned by others. Thus was born the concept of Sharing Economy. This concept has been applied in several sectors with success as it is the case of the transport sector and the real estate sector.

However, the Sharing Economy has become a complex phenomenon with several ramifications in different aspects, two of these same slopes are: academic and social. This thesis will focus on a big-time analysis of both strands. On the academic side, supporting a bibliometrics analysis will try to understand what the repercussions of this phenomenon at the level of academic publications, analyzing number of articles per year, authors, publications, terms and key articles. On the social side, relieving Crimson Hexagon's ForSight analysis software will analyze, number of tweets per year, authors and important events on the social network Twitter.

This analysis has three main aims: firstly, to understand the phenomenon of Economy Sharing in the two aspects studied, secondly, to perceive the differences existing in the in the two strands studied and finally, using altmetrics discovering what is the difference between social relevant articles and the academic relevant articles of Sharing Economy.

Keywords: sharing economy, bibliometrics, social media, altmetrics

JEL Codes: C89, O33

Resumo

As atuais alterações estruturais na economia mundial levaram ao aparecimento e rápida proliferação de um novo modelo económico cujos indivíduos partilham ativos detidos por outros. Assim nasceu o conceito de *Sharing Economy*. Este conceito foi aplicado em diversos setores com sucesso como é o caso do setor dos transportes e do setor imobiliário.

Contudo, a *Sharing Economy* tornou-se um fenómeno complexo com diversas ramificações em diferentes vertentes, duas dessas mesmas vertentes são: a académica e a social. Esta tese centrar-se-á numa análise de *big data* de ambas as vertentes. Na vertente académica, suportando de uma análise de bibliometria irá tentar perceber qual as repercussões deste fenómeno ao nível de publicações académicas, analisando número de artigos por ano, autores publicações, expressões e artigos chave. Na vertente social, socorrendo software de análise ForSight da Crimson Hexagon irá se preceder uma análise temporal do número de tweets por ano, autores e eventos importantes.

Esta análise tem três intuitos principais: em primeiro lugar compreender o fenómeno do *Sharing Economy* nas duas vertentes estudadas, em segundo lugar, perceber as diferenças existentes nas duas vertentes estudadas e, por fim, e usando *altmetrics*, descobrir as diferenças entre artigos socialmente relevantes e academicamente relevantes sobre *Sharing Economy*.

Palavras-chave: economia da partilha, bibliometria, redes sociais, altmetria

Códigos JEL: C89, O33

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Abbreviations

AAS ─ Altmetric Attention Score

CEO ─ Chief Executive Officer

FWCI ─ Field-Weighted Citation Impact

GS ─ Google Scholar

IoT─ Internet of Things

ITC ─ Information and Communication Technology

SE ─ Sharing Economy

WoS ─ Web of Science

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1. Introduction

Sharing Economy (SE) could be used to define an online service of coordination of the act of sharing goods and services between people. This new business approach created an opportunity to develop and boost business with a minimum amount of investment due to the replacement of ownership with access (Hamari *et al.*, 2016; Hartl *et al.*, 2016). This new form of business interaction led to the rise of such companies as Uber, in transportation, or Airbnb, in hospitality (Bradley and Pargman, 2017).

The SE is an outcome of a combination of factors from different sources. From economic factors to technological, the SE is a phenomenon of its age (Moehlmann, 2015; World Economic Forum, 2016), directly related to the Third Industrial Revolution (Freeman and Louçã, 2001) as well the emergence of the Network Society (Castells, 2010; Costa *et al.*, 2019).

Due to the complexity of the SE society in general and academic, literature had studied the subject, trying to understand, scrutinise and report essential milestones, news and events. However, is there a difference between these two types of analysis? The answer to this research question is the main purpose of this dissertation, finding and reporting the differences between the social side and the academic side of the topic sharing economic. On the social front, the analysis will be analysing what was SE on Twitter: how was the evolution of tweets and terms? What were the key moments and news in the Twittersphere? Who were the most critical Twitter users, regarding SE? In the academic side, will proceed in a bibliometric analysis of the Scopus database and an inquiry of the most important journals, authors, articles and markets. After both isolated analyses, a comparison of the results will be scrutinised, focusing on the differences.

In concerned to the relevance of the topic, this analysis is a further continuation of the bibliometric analysis of the topic such as Jerónimo (2017), with an orientation to the social side of the problem in concern altmetrics. This analysis also bridges the gap between management and economics. On one side, it gathers information in the three fields of study, business, economics and regulation. On the other side, studies a frontier topic, SE, which represents an opportunity for business nowadays and a relevant subject of economics study due to its innovation rupture with traditional elements of production factors (Hasan and Birgach, 2016; World Economic Forum, 2016).

The dissertation is structured as follows. Chapter 2 focus on the an overall look to the theme of the SE, from the different terms, markets, causes and issues which concern this problem. Chapter 3 targets the methodology and the databases, explaining how the different databases were collected and the type of analysis were made. Chapters 4 to 7 focus on the results of the analysis: 4 and 5 are targets the two main analysis, Twitter and bibliometric respectively, while chapter 6 focus on the altmetric side of the analyse which combine the social and academic side, finally chapter 7 analysis the sentiment of Airbnb. Chapter 8 focus on the main conclusions of this analysis. We should also focus on how the bibliography is divided in three different components: the main bibliography, which reunites every conference paper, article or book present in the following analysis, however not present in the different tables of analysis; the corpus which reunites every article which is mention on a table of analysis including the ones presented in the appendixes and grey literature for every non-academic literature of support mainly for question regarding the Twitter analysis.

2. Understanding the Sharing Economy

2.1. An introduction to Sharing Economy

SE is a new type of business model which is gaining attention from academics, media (see Appendix 1) and social media (Jerónimo, 2017; Martin, 2016; Laurell and Sandström, 2017). SE in its genesis is an act of sharing something (from tangible as a car, intangible as skills or in the frontier as space) with a network of actors (Qing Zhu and Lee, 2016; Schor and Fitzmaurice, 2015). The emergence of a SE, as an ecology of new interactive business processes, can be understood as structural change in the economy, which is an involving complex system (see Caraça *et al.*, 2006, 2009).

The SE as business model is a direct evolution of simple act of sharing (Belk, 2009). When comparing the SE to a traditional form of market, or the term used by Cusumano (2015), the traditional economy, the differences between both markets are evident. Mair and Reischauer (2017) compared both forms of markets, traditional economy and the SE, in five dimensions regarding one common feature, transaction (see Table 1). These aspects are forms of compensation, locus, focus, partners and infrastructures (Mair and Reischauer, 2017).

Table 1- Comparison between the Sharing Economy and the Traditional Economy

	Sharing Economy	Traditional Economy
Forms of compensation	Bartering, trading, gift giving, payment	Payment
Transaction locus	Markets	Markets
Transaction focus	Redistribution of access to resources	Production, distribution and access to resources
Transaction Partners	Individuals	Organizations, individuals
Transaction infrastructure and infrastructure provider	Digital platforms operated by organizations	Distribution channels between organizations and individuals, digital platforms operated by organizations

Source: Mair and Reischauer (2017)

As provided by Table 1, some of the differences between the two models are focusing individuals partners and digital platforms as infrastructure provider as well as more sources of compensation (Mair and Reischauer, 2017). SE companies could be divided

into two criteria, market orientation (profit or non-profit) and organisation (business-to-business or peer-to-peer) (Schor and Fitzmaurice, 2015).

This type of new business model emerged due to of the rise of digital technologies which led to digitalisation of physical and a more facilitated form of sharing, not only locally but sometimes globally (Sundararajan, 2016). This digital globalisation is one of the strengths of the SE which was capitalised for some of the most well-known companies associated with this term, Uber and Airbnb (Einav *et al.*, 2016)[1]. Until 2015, these two firms have raised 11 billion dollars in venture capital (Sundararajan, 2016). In the next chapters, will explore this business model starting with the different terms and definition for this phenomenon, following with the causes for the rise of SE, an explanation of the most common application of this business model, an analysis of the consequences of SE and will end with some of the controversies.

2.2. Sharing Economy: complexity of definitions and terms

The term SE is not a consensual term, neither have a consensual definition (Codagnone and Martens, 2016). Botsman and Rogers (2010a) referred to the conditions as "*collaborative consumption*", others authors, such as Bardhi and Eckhardt (2012), preferred the terms "*access-based consumption*". The term "*sharing economy*" is mostly used in national and international organisations such as The United States Federal Trade Commission (FTC, 2015), the Organisation for Economic Co-operation and Development (OECD, 2015), the European Commission and the European Parliament (Piaguet, 2014).

Due to this plurality of terms, this first analysis will divide two better-known terms, Sharing Economy and collaborative consumption with the objective of determining the differences between the two. In the third part of this chapter, will focus on the less known close synonyms regarding new social-economical phenomenon: "*gift economy*" (Cheal, 2015), "*on-demand economy*" (Berg, 2016), "*peer-to-peer economy*"[2] (Strulo *et al.*, 2003), "*rental economy*" (Babione, 1964), "*gig economy*" (Minter, 2017), "*access-based*

[1] That globalization is connected with science, technology and innovation is a well-known and research stylized fact (see Costa, 2015a).
[2] In the search was used "*peer economy*" which gathers the results of "*peer-to-peer economy*" and "*peer economy*".

consumption" (Bardhi and Eckhardt, 2012) and "*access economy*" (Altrock and Suh, 2017).

2.2.1. Collaborative Consumption

The term "*collaborative consumption*" was introduced by Felson and Spaeth (1978) and characterise activities of sharing consumption of goods and services. This definition suited more social events such as a washing machine use by a family or sharing a car (Albinsson and Perera, 2012). This activity will later develop a new form of services and business model, including activities of "*traditional sharing, bartering, lending, trading, renting, gifting and 'swapping'*" (Botsman and Rogers, 2010b). Belk (2014a) discussed these two perspectives which include intrinsic value to his definition, a possibility of non-monetary compensation.

This new business model has a direct origin in the Information and Communication Technology (ITC) interactions which could lead to a diminish the importance of ownership (Pazaitis *et al.*, 2017).

Therefore, this new paradigm of consumption, collaborative consumption is almost an anti-consumption behaviour, which replaces ownership for access and introduces online services and community as the mediator (Albinsson and Perera, 2012; Botsman and Rogers, 2010b; Hamari *et al.*, 2016; Hartl *et al.*, 2016).

2.2.2. Sharing Economy

This subchapter will focus on the different definitions of SE. This topic was analysed by Acquier *et al.* (2017) who studied the non-consensual question of meaning. The problem comes from SE being an umbrella construct[3] with a multidisciplinary nature with a blurred definition (Acquier *et al.*, 2017; Selloni, 2017).

The broader concept and umbrella constructs originates challenges accuracy (Hirsch and Levin, 1999). Therefore, academics divide into two groups regarding its definition and narrow, more restricted definition and broad definition (Acquier *et al.*, 2017). The narrow

[3] "*broad concept or idea used loosely to encompass and account for a set of diverse phenomena*" (Hirsch and Levin, 1999: 200).

description is a more accurate definition, and it leads to the exclusion of parts of the complexion of an umbrella construction (Hirsch and Levin, 1999). Acquier *et al.* (2017) characterise Benkler (2004), Cockayne (2016), Eckhardt and Bardhi (2016), Frenken and Schor (2017) and Stephany (2015) as narrow definitions and Habibi *et al*. (2017), Muñoz and Cohen (2016) and Schor (2016). Acquier *et al.* (2017) also classified some authors who characterised this phenomenon as collaborative consumption.

The authors who preferred a narrow definition excluded something from the definition when comparing to a broader definition. For example, Frenken and Schor (2017) rejected production, to focus more on the consumption and classified SE as a peer-to-peer interaction for temporary access to a physical asset. This perspective is a close definition to collaborative consumption, however, restrain what could be shared in this market (only tangible assets) (Acquier *et al.*, 2017; Botsman and Rogers, 2010b). Eckhardt and Bardhi (2016) instead of emerging definitions with collaborative consumption disrupted, presented SE with an obligation of non-transference of property excluding gift giving and bartering which are shown in Botsman and Rogers (2010b) as activities of collaborative consumption in their definition. This perspective reinforces a difference between collaborative consumption and SE. If there is a problem because of the restrict nature of narrow definition, broad definitions of SE lack presuppose and become a generic term. One of the best examples is the definition from Habibi *et al*. (2017): "*suggest sharing-exchange that helps distinguish the degree to which actual sharing is being offered*" (Habibi *et al*., 2017: 115). This definition only defines SE as a concept between true-sharing and pseudo-sharing and not characterise the business model itself (Acquier *et al.*, 2017; Habibi *et al.*, 2017).

So, a problem remains, what is SE? Due to the complication between narrow and broad definition, probably one of the most accurate interpretation comes from Mair and Reischauer (2017) which focus on the way the market is structured in this type of model. In this perspective, SE could be defined as: "*a web of a market in which individuals use various forms of compensation to transact the redistribution of and access to resources, mediated by digital platform operated by an organization*" (Mair and Reischauer, 2017: 12). This definition is neither a pure definition nor a pure broad definition. It is general enough in the market eligible for this type of business model since it is a web of individuals non-specifying if it is a business-to-business, business-to-consumer or consumer-to-consumer market. In contrast, Frenken and Schor (2017) extend the type of

options which could be shared in this kind of markets, yet presents some restrictions to what SE should be, by mentioning the digital platform aspect as mediator. This digital importance for SE will be later discussed as well as two other important aspects of SE introduced by Hamari *et al.* (2016), sustainability and green consumption.

2.2.3. Other terms

This part of the chapter will focus on other terms related to the SE used in the search query of the bibliometric and Twitter analysis. Starting with "*access-based consumption*" that was first introduced by Rifkin (2000) and refers the term as activities different from ownership and sharing where ownership transference does not occur and is mediated in markets (Bardhi and Eckhardt, 2012). "*Access economy*" is the term used to describe the application of sharing something in content-based services (video, books, etc.) (Van Der Weel, 2014). The "*on-demand economy*" was introduced by Cockayne (2016) as a synonym of SE, which leads to a greyer area of this chapter, the four terms related to SE presented in the introduction of the "*rental economy*", "*peer-to-peer economy*", "*gift economy*" and "*gig economy*". These expressions are not complete synonyms for the SE. However, as proven in the analysation bellow, they have some points of connection to the SE.

Firstly, the "*rental economy*" could be used for describing this complex reality due to one of the definitions of collaborative consumptions presented before, the Botsman and Rogers (2010b)'s definition which include rental of activities. Even, for example, Airbnb likes to define their business model as a short-term "*rental economy"* in contract to traditional rental industries (McNamara, 2014). Therefore, the "*rental economy*" could be considered a part of the SE and is an expression of a trend toward globalization in consumer services (see Costa, 2015b, Costa and Mendonça, 2018).

Secondly, the "*peer-to-peer economy*" could be considered a SE when analysing the work of Einav *et al.* (2016), which compares peer production, such as Airbnb and Uber, against traditional production. The same characteristics of SE were presented in the peer-to-peer markets of Einav *et al.* (2016): from the usage of an online network to the analysation and importance of big data for these businesses. The core of a peer-to-peer network is the matching of a two sides markets using a network (Einav *et al.*, 2016). The importance of

the network and connectivity was reinforced in the definition of SE of Mair and Reischauer (2017) presented in subchapter 2.1.

Thirdly, the comparison between the "*gift economy*" and SE is studied in one of the chapters of Sundararajan (2016). The term "*gift economy*" was popularised by Hyde (1983) and it is economically different from the market economy where there a gift exchange with an emphasis on community. This community is the basis of repayment of gifts previous giving which is similar to what a peer-to-peer market is, and therefore platforms, such as Amazon and Airbnb, due to this reciprocity paradigm could also be considered "*gift economy"* (Sundararajan, 2016).

Fourthly, "*gig economy*" could be considered an interchangeable term as reported by Martin (2016). "*Gig economy*" can be divided into two versions: crowd work which uses online platforms for completing assignments; and using applications for otherwise activities which not require any technology of this calibre such as transportation (Bergvall-Kåreborn and Howcroft, 2016; De Stefano, 2016).

Due to the plurality number of terms in relating to the business model, companies, such as Uber, have been considered SE by Schor (2014) and gig economy by De Stefano (2015) and even collaborative consumption by Belk (2014). For these reasons, this dissertation will consider all the previous expressions mentioned as synonyms and used in the search query for the elaboration of the databases (bibliometric and Twitter).

2.3. Factors behind the Sharing Economy

Fine (1980) presented two principal reasons for sharing: surviving and as a social act of altruism. Nonetheless, when discussed the topic of sharing as a business model, other factors are comelier attributed to its genesis, namely socioeconomic and technological factors (Sundararajan, 2016; World Economic Forum, 2016). This chapter will focus on these two matters.

2.3.1. Socioeconomic reasons for Sharing Economy

There are some socioeconomic reasons factors for the SE. Sundararajan (2016) traces this cause back to the creation of the large metropolitan areas after the Industrial Revolution.

The lead to the sharing of some aspects, such as transportation (taxis, buses) and spaces (gardens, community areas in apartments buildings), are the genesis of SE model without the digital aspect (Sundararajan, 2016). This digitalization of the economy led to transformation of the standards in innovations leading to an open source community view of technology (Teece, 2018). The SE also has a two-sided market or multi-sided market-based origin (Tirole, 2017). This type of markets focuses on one or multiple platforms in which interactions between the users occurs (Rochet and Tirole, 2006). The emergence of SE models and urban areas was reinforced in the creation of sharing cities which are integrated systems of sharing (Agyeman *et al.*, 2013; McLaren and Agyeman, 2015). A representation of the different dimensions of a sharing city is represented in Table 2.

Table 2- Sharing aspect of a sharing city

Sharing aspect	Concept	Examples
Material	Recovery and recycling	Glass and paper banks, scrapyards
Product	Redistribution markets	Flea markets, charity shops, freecycle
Service	Product service systems	Zipcar, Netflix, fashion and toy rental, libraries
Wellbeing	Collaborative lifestyles	Errand networks, peer-to-peer travel/accommodation (Airbnb)
Capability	Collective commons	The internet, safe streets, participative politics

Source: Agyeman *et al.* (2013)

Chase (2015), on the other hand, presents SE as a direct answer to a possible ecological crisis. The overconsumption of resources of the latest years could lead the world to a severe extinction of essential resources which could be solved by an SE business model (Chase, 2015).

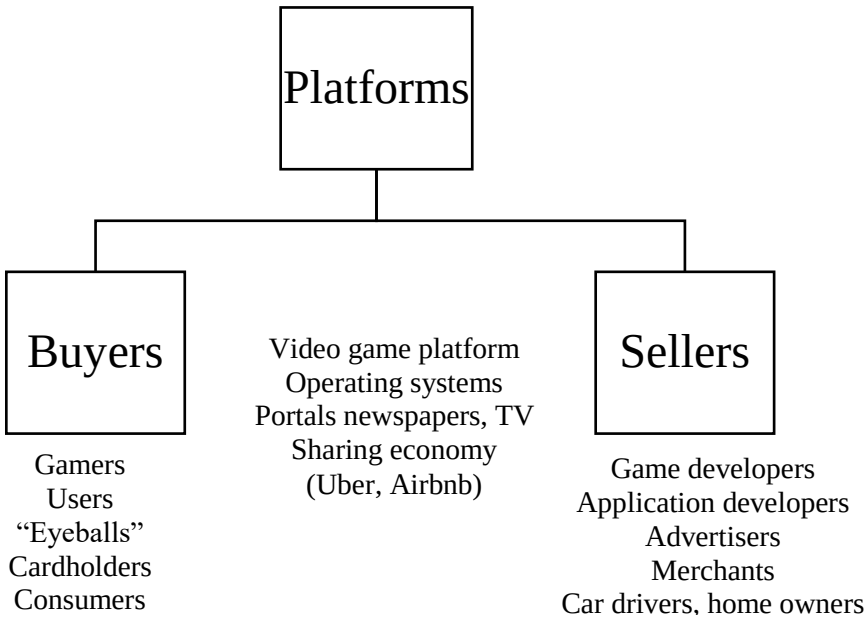
2.3.2. Technological factors for Sharing Economy

SE is, besides a socioeconomic phenomenon, a technological phenomenon. SE only was achievable due to some of the innovations of the latest years (Hamari *et al.*, 2016). In this

chapter will focus on the technological forces which enable the emergence and spread of SE markets and companies.

One of the first and most important aspects which lead to this phenomenon is digital platforms. Digital platforms are "*complicated mixtures of software, hardware, operations, and networks*" (Kenney and Zysman, 2016: 64). These multidimensional platforms provide the user with a set of techniques and technologies (Kenney and Zysman, 2016). The importance of these services led to the creation of the term platform economy which is a type of interactions between agents in a platform based market (Jullien, 2011; Kenney and Zysman, 2016). When we look at this platform base market, four companies stand out from the other: Facebook, Amazon, Netflix and Google, collectively they have been named by Eric Schmidt in 2011 as the Gang of Four in 2011 but lately has been referrer as FANG (Hern and Fletcher, 2017; Schonfeld, 2011; Simon, 2011). The reasons for not considered the term platform economy in the search query are: firstly platform economy focus on the platform instead of the activity, while SE and related terms focus on some sort of activity, secondly some authors such as Tirole (2017) prefers to use the term SE as one of the examples of a two-sided platform market, therefore using the platform base market or economy to broader scenarios such as demonstrated in Figure 1.

Figure 1- Two sided-platforms



Source: Tirole (2017)

The digital platform is another factor in the emergence of the SE is the digital consumption (Sundararajan, 2016). The growth of smart devices launched the apps markets and therefore SE platforms. The social media platforms, such as Facebook, enable a more accessible way to use this platform (Belk, 2014a; World Economic Forum, 2016). Besides this importance of digital consumption, there is also a preponderance in the collection and further analysis of big data (World Economic Forum, 2016). Big data is a driver of these types of companies due to their application in marketing, most especially product development, consumer service, target recognition and analysis and even managerial use which could result in competitive advantages (Erevelles *et al.*, 2016; Sivarajah *et al.*, 2017). With also a significance for the rise of SE is the Internet of Things (IoT) as reported by Rifkin (2000). IoT is the connectivity between objects of everyday life. This connectivity increases the performance of an object enabling improvements in efficiency (Rifkin, 2014).

There is also another factor presented by authors, such as Pazaitis *et al.* (2016) and Huckle *et al.* (2016), which help and continues to support SE platforms, blockchain. The blockchain is a part of a more significant phenomenon which was the digitalisation of trust or semi-anonymity of the internet (Sundararajan, 2016). While Blockchain offers trust in transactions, Bitcoin offers an opportunity for exchanges without the need of a third member due to the digital aspect of this currency (Eyal and Sirer, 2014).

The previously mentioned reasons even though have consequences in the industrial sector, they are more associated with services. Nonetheless, one innovation concerning the SE transformed the industrial production, 3D printing (Prince, 2014). The differences which 3D printing bring to traditional industrial production are, as referred by Rifkin (2014), a decrease in the interaction of the human in production, only focusing his work in design and software development; the open source software of 3D printing facilitate the creation of new objects for all creators; a reorganization of the process of multiple pieces object production to a solid one peace object production; saving in reparations because new parts could be print in these printers itself; interactions with other objects with the IoT characteristics and, finally; a possibility of a less costly centralization of operations.

2.4. Applications of the Sharing Economy

In the latest years, SE has been applied to a large number of markets (Schor and Fitzmaurice, 2015). One of the first markets using the internet as a sharing device was the music industry, which had the first platform of its kind with Napster (Becker and Clement, 2006; Giesler, 2006). However, Napster was an illegal form of sharing media. Illegal ways of sharing music produced a loss in revenue between the year 1999 and 2009 of 8.3 billion dollars, decreasing the industry value from 14.6 billion dollars in 1999 to 6.3 billion dollars in 2009 (Goldman, 2010; Sanders, 2005). Despite this original loss, the illegal online sharing of music enables the emergence of a new form of music delivering system and a new market, the online music market. Firstly, iTunes, an online platform developed by Apple, for buying music, secondly other sources of media such as movies, and, thirdly, music streaming platforms such as Spotify (Johnson *et al.*, 2008; Wagner *et al.*, 2014).

After the success of the application of these online peer-to-peer model of sharing, this model market was replicated in multiple markets. Throughout the mini-case which will be addressed in this study, the focus will be on the accommodation/hospitality market and the transportation market. In the case of hospitality, companies such as Airbnb bring a lot of innovation to their market (Guttentag, 2015). The disruptive approach to a rental of space between peers on an online base as well a cheap alternative to some otherwise market dominated by hotels is some of the critical features of this new major player (Guttentag, 2015). Regarding the transport industry, this was the application of a business model to an activity with an already widespread appeal, car sharing (Cohen and Kietzmann, 2014).

2.4.1. Transport industry

This subchapter will focus on the application of SE to the transport industry, more specifically car sharing. The need for a more sustainable source of transportation has been one of the critical issues for organisations such as the European Commission (Loose, 2010). Car sharing could be traced back to the carpooling as social production, a non-market activity (Benkler, 2004). This type of activities reaches pick in the United States in the decade of the 70's due to the oil crisis (Ferguson, 1997).

In Europe, the car-sharing business is growing, and the latest forecast for 2020 in the Deloitte Monitor (see Appendix 2) presents an exponential growth of users and cars Pottebaum *et al.* (2017). Relating to the most important markets in Europe are the United Kingdom, France, Italy, Germany and the Scandinavia (Pottebaum *et al.*, 2017).

Some studies have analysed the reasons behind people access to a peer-to-peer network for sharing a car. Bardhi and Eckhardt (2012) and Wilhelms *et al.* (2016) use the same methodology to answer this question, using interviews with users of peer-to-peer networks. Wilhelms *et al.* (2016) divide the reasons as functional and psychosocial. The functional is related to economic values, such as a new source of income, reduction of costs or merely to circumvent an instinct problem of owning a vehicle and depreciation of the value (Wilhelms *et al.*, 2016). The psychological reasons are related to the sense of being part of a community as well of curiosity and an environmental awareness (Wilhelms *et al.*, 2016). Environmental awareness is also a reason according to Moeller and Wittkowski (2010) for people preferring renting to ownership. Therefore, due to the similarities between renting and sharing, we could speculate that there is a similar reason in the demand side and supply side of the car-sharing market, an environmental awareness (Moeller and Wittkowski, 2010; Wilhelms *et al.*, 2016).

One of the platforms for car sharing is Zipcar, and the database of users of this platform is used in Wilhelms *et al.* (2016). This commercial car sharing platform operates in North American and European cities (Belk, 2014a). The success of platforms like Zipcar led to automobile manufacturers such as Mercedes, BMW, Volkswagen and Peugeot to adopt this business model (Belk, 2014a). The most controversial company of SE related to car sharing is Uber due to the question of regulation (Einav *et al.*, 2016).

2.4.2. Lodging industry

The lodging industry is also going importance due to the rise of Airbnb (Rowe, 2017). The company itself, like Airbnb, will be introduced later in the mini-case of this dissertation. Therefore, this part will focus on studies reading the lodging industry and not the company Airbnb itself. The lodging industry is different from the others in the factors of satisfaction and the possibility of reuse the platform. Möhlmann (2015) compares elements of the transport industry, such as monetary reasons, a sense of

community or environment and adds others determinants as familiar, internet capacity, quality of the service, smartphone application, affinity, trust and utility of the service.

The accommodation platforms can be divided in three groups: rental (such as 9flats and Airbnb) which are one side short-term rental services, reciprocal (such as Behomm and Guest to Guest) which are two sides exchange house between peer platforms, and free (such as BeWelcome and Trustroots) which are accommodation sharing platforms with no monetary transaction (Zvolska, 2015).

In the lodging industry, the SE model could lead to structural consequences in this market. Some studies, as Tussyadiah and Pesonen (2016), defends that SE could lead to an overall reduction of cost and changes in travel patterns, like increasing more prolonged periods of stay and opens the opportunity for other travelling destinations. These new destinations originated because of the lower amount of money required to become hospitality friendly; there is no need for the construction of a hotel for example (Tussyadiah and Pesonen, 2016).

2.5. Consequences of Sharing Economy

Every application of SE has effect in its respective market. Some of which were discussed in Subchapter 2.4.. In contrast, this chapter will focus on the implications of the business model itself for the economy and not for a specific market. These consequences are transversal between all markets.

2.5.1. The economic consequences of Sharing Economy

SE is a rupture with previous economics models of sustainability and efficiency. Before starting, we should address an issue regarding economies of scale, the problem of imperfect divisibility of factors. Due to some factors only have discrete units or a large scale there is a need to achieve the optimum proportion which in the pass was believed to only revolve with large-scale companies (Chamberlin, 1948). However, when in some markets, due to their dimension, this results in the creation of natural monopolies, the consequence is the least efficient market structure (Berg and Tschirhart, 1988). So, what could SE bring to this question? What are the economic effects of SE? There are four significant economic consequences of SE: increase in efficiency, the network effects, an

increase in consumption, variety and quality and, finally, a democratisation of the opportunity (Sundararajan, 2016).

Efficiency is consequently the centre of most studies like in Daunorienė *et al.* (2015), Hasan and Birgach (2016), Martin (2016) or Parguel *et al.* (2016). Sustainability as a broader term has applications in society, sociology, technology and economy (Daunorienė *et al.*, 2015; Martin, 2016). This part will only focus on the economic side. A misconception about the SE may be taken. A transition from a traditional concentrated market with large companies to a spread of micro-entrepreneurs, a more conventional sight of a SE market, could be seen as an efficiency loss (Krugman, 1979). The studies previously mentioned try to answer these misconceptions. However, the use of production factors in sharing economies platforms, like in the case of labour TaskRabbit and the case of capital, most specific financial capital, Funding Circle, can occur an increase of productive in a *ceteris paribus* situation due to capacity usage approaching installed capacity, leading to scale economies (Sundararajan, 2016).

Secondly, concerns the network effects throughout the dissemination of "*learning by doing*" in a network of peers and as a consequence of the two-sided market nature of SE. SE is a type of peer-to-peer market as previously discussed when it introduced the term peer-to-peer economy, and therefore some of the consequence of a peer-to-peer marketplace are presented in SE (Codagnone *et al.*, 2016). In the first part, peers may learn from the experiences of each other. In the second part, the success of a two-sided market depends on the number of the user on both sides of the network (Eisenmann *et al.*, 2006).

Thirdly, an increase in variety and consumption because of the origin of new experiences of consumption and higher quality. As presented by Krugman (1979), this diversification and differentiation of products led to higher economic activity.

Lastly, a democratisation of the opportunity empowering individuals with new forms of micro-entrepreneurship which enable return rates only reached, until now, by a small portion of the population, rejecting the idea presented by Piketty (2014) of a *status quo* regarding return rates for the different segments population.

The concertation of markets and sources of revenue is another consequence represented in some studies, that has been reinforced in the latest year (Murillo *et al.*, 2017). For authors such as Katz (2015), SE has incentives to eliminate competition because

companies source a way to dominate the value chain and it is more accessible if the companies control the peer-to-peer network. This is why most SE market segments are more than 50% dominated by one firm (Murillo *et al.*, 2017).

2.5.2. Other consequences

Due to the complicity of the SE, the effects are not restrictedly economic or ecological, SE have consequence in multiple venues, from the labour market to the interactions between transactions. This part will make a general overview of other consequences of SE. Mair and Reischauer (2017), as well as Sundararajan (2016), studied the consequences relating to market dynamics. For these authors, SE questions, previous well define frontiers, due to the proximity of the interactions. The blurring of production and consumption, private and public, leisure and work, finally, full employment and part-time employment creates not only opportunities to the market but also challenges for established companies (Mair and Reischauer, 2017; Sundararajan, 2016).

2.6. Controversies surrounding the Sharing Economy

The SE is embraced with debates, in the matter of fact, some studies in this area concluded that even the majority of consumers are in favour of the introduction of some governance system in this business model (Hartl *et al.*, 2016). The reason is mostly as protection of the egoistic and profit-driven attitudes by corporations. The conversation about the regulation of this type of markets has been a focal point of the study of this phenomenon (Miller, 2016).

These controversies surrounding the regulation of the SE creates two distinct narratives. Some defenders of the SE as an economic opportunity providing a more sustainable form of consumption and guiding the economy for a more equitable, decentralised and sustainable structure or the defenders of the SE as a creator of unregulated. Some of these controversies will be discussed in the Twitter analysis. Problems of regulation regarding companies, such as Uber, are well addressed in the public domain.

In the chapter regarding the Twitter's study will try to answer the question: what were the impacts of controversies around the public? Did it have a negative consequence one the image of some of the companies? Which companies suffer the most?

2.6.1. Regulatory issues

The regulation issues surrounding the SE could be the divided into two different points: the question of the regulation itself and the problems with taxation (Murillo *et al.*, 2017). The central question of this topic is: should the SE platforms be regulated? The main arguments for a non-regulated SE market are: the efficiency in the allocation of resources in comparison to other markets and the fact regulation is a barrier to the growth of SE firms (Cannon and Summers, 2014; Murillo *et al.*, 2017). Nonetheless, arguments for the regulation of these industries could also be presented. One of these cases is the differences between regulation of the players, namely, between traditional players and the SE players and none of these issues is more represented than the Taxi Uber situation (Cannon and Summers, 2014). One of the complaints of taxi drivers is the fact that in comparison to Uber, the number of law and legal requirements that they need to comply with are significantly more than Uber, making unfair competition (Cannon and Summers, 2014). Regarding taxation, the issue is no different than all the big corporation and its tendency to advantage loopholes in taxation legislation (Murillo *et al.*, 2017).

2.6.2. Other issues

One of the other controversies regarding the SE is the usage of independent contractors as a cost-saving matter (Murillo *et al.*, 2017). The SE is for some authors an opportunity in the labour market and as the previous mention blurred lines between employment and part-time employment (Mair and Reischauer, 2017; Sundararajan, 2016). However, some authors defend that this type of contracts only creates the worst work situation for the employees, removing benefits and money (Collins, 1990; Davis-Blake and Uzzi, 1993; Minter, 2017). Estimations from Srnicek (2016) says that Uber could lose 852 million dollars in lawsuits if they do not use independent contractors.

3. Methodology

3.1. Social Media Big Data

3.1.1. Social Media and Twitter

Social media is a multidimensional source of information. For Murthy (2013), social media is an electronic tool which enables the access to information, collaborations and relationships with an inexpensive aspect.

It is crucial to differentiate the social media's definition from social networks' definition. Social networks, such as Facebook, are platforms and focus on the creation of communities, while social media channels, like Twitter, emphasis on the diffusion of content (Murthy, 2013). This frontier is blur, for some authors such as Nielsen and Schrøder (2014), Facebook is, besides a social network, a social media platform. The importance of the role of social media as a source of information led to a reframing of the notion of information literacy[4] to a *metaliteracy* or *transliteracy*, this is a combination of diverse sources of literacy: media, digital, visual and *cyberliteracy*, therefore the ability to use all sources of information (Alonso-Arévalo, 2014; Ipri, 2010; Mackey and Jacobson, 2014).

This research will focus on Twitter which is "*a microblogging website that allows users a limit of 140 characters*[5] *per post, or 'tweet'*" (Kim *et al.*, 2016: 431). According to the study *Demographics of Social Media Users* in 2016, 24% of Internet users have a Twitter account (Greenwood *et al.*, 2016). Since Twitter is a way of propagating influential and relevant information, some studies emerged with the purpose of comprehending if Twitter is a social media or a news platform (Kim *et al.*, 2016). In 2017, *News Use Across Social Media Platforms* report discovered that Twitter had gained a share of users who use social media as a news form (Shearer and Gottfried, 2017). Twitter also evolved in the way in which the users of the platform interact. In the begging, it was a status update of a base network where the user reported what was happening to him in that specific moment. Nowadays, Twitter is mostly used for public self-expression of themes and topics (Wu, 2017). Twitter also has a possibility of "*instant dissemination*" (Hermida, 2010: 299) of information where official sources and the public interact freely (Hermida, 2010). There

[4] Information literacy could be defined as "*to represent the ability to use information, or possibly the possession of a knowledge of information*" (Owens, 1976: 27).
[5] Since September of 2017, the number of character of English language increase to 280 characters (Rosen and Ihara, 2017).

is also questions about the legitimacy of the big data and therefore social media big data. Authors such as Lazer *et al.* (2014) focus on this difficulty and the necessity to a careful analysis.

3.1.2. Twitter as an academics' source

Twitter has influence academic researchers in two different ways: as a new form of research source and how investigations are evaluated in with altmetrics (Alonso-Arévalo, 2014). This chapter will focus on the resource source thereby, leaving the altmetrics analysis to the bibliometric chapters. Recent research elaborates on the study of Twitter base academic research uncovering disciplines, method of analysis and number of data used. Zimmer and Proferes (2014) takes the investigation of Williams *et al.* (2013) further and focus on Twitter base academic between 2006 and 2012, in a total of 382 academic publications. The research concluded that the top 5 disciplines of Twitter studies were: computer sciences, information science, communication, economics and business. Most of the investigations used databases comprise up to 10 million tweets using usually content analysis methods (Appendix 3, 4 and 5).

There is also an investigation regarding specific journals. Erdt *et al.* (2016) applied scientometrics to collect and scrutinise some of the use of this source of information. Predominantly, the studies concerning Twitter in this journal emphasis on the spread and publicity of scientific work through this platform (Erdt *et al.*, 2016; Vainio and Holmberg, 2017). This scientific works led Twitter to be considered an essential tool for web mining[6] (Lorentzen, 2014).

When analysing Twitter, some variables are usually studied. Table 3 synthesise the variables investigated by Suh *et al.* (2010) that will be examined in this dissertation.

[6] Web mining is the application of data mining techniques to web-based information (documents or services) (Singh and Singh, 2010).

Table 3- Twitter variables

Variable	Explanation
URL	The URL (internet link) in a tweet
Hashtag	Introduced by the symbol # is used to index keywords and topics of conversation on Twitter
Mention	Introduced by the symbol @ following the username in the Twitter (e.g. @username) to begin a public discussion on Twitter
Follower	A user who follows the tweets of a particular author
Retweet	A retweet is a republication of a previous tweet. This function is used to share a tweet with the followers of a user. Some users use the abbreviation RT to symbolise content from someone else. However, is not an official function of Twitter.

Source: Adapted from Suh *et al.* (2010) with information from Twitter (2018)

3.1.3. Crimson Hexagon and the application for this research

For the Twitter analysis, a search query was made concerning the content analysis of a Crimson Hexagon's software, Foresight. Crimson Hexagon oversees social media to recognised linguist patterns of specific concepts identified by human coders (Kim *et al.*, 2016). The type of algorithm in the was is presented by Daniel J. Hopkins and Gary King's Automated Nonparametric Content Analysis for Social Science (Hopkins and King, 2010).

Other tools have the same functionalities that Foresight like theme, sentiment, demographics and influence analysis, this is the case of Sysomos, MAP and NetBase, that consequently can be compared with Foresight (Halfpenny and Procter, 2015). The Crimson Hexagon's software is adopted by academic researchers in several domains, including to discover the public's reaction to the themes or the evolution of public response over time (Breese, 2016).

One of the principal features of Crimson Hexagon is the sentiment analysis. These feature has been applied as a proxy of sentiment of the population for topics such as the opinion of significant political figures (European Journalism Observatory, 2018; Santos, 2016;), sociologic circumstances toward a current of thought such as Anti-Americanism and Anti-Interventionism by Arabic language speakers as study by Jamal *et al.* (2015) or the

study of Runge *et al.* (2013) sentiment towards nanotechnology. In this research will focus content analysis, event detection and user analysis for the main topic and sentiment analysis for Airbnb.

3.2. Bibliometrics

3.2.1. An introduction to a bibliometric analysis

The term bibliometrics was introduced by Pritchard (1969) to define: "*application of mathematics and statistical methods to books and other media of communication*" (Pritchard, 1969: 238). Also presented as scientometrics[7], bibliometrics gained importance with the introduction of electronic resources and the creation of multidisciplinary databases such as Science Citation Index (Andrés, 2009). This study will focus on the sub-area of bibliometrics of scientific disciplines, the application of bibliometric indicators to SE and its synonyms (Andrés, 2009).

3.2.2. Bibliometric studies on Sharing Economy

This study will not be the first application of bibliometric analysis to Sharing Economy. There were identified four relevant studies in this area: Cheng (2016), Oh and Moon (2016), Jerónimo (2017) and Dillahunt *et al.* (2017). Appendix 6 compares those studies with the bibliometric analysis of this thesis. This study will complement a substantial number of research articles and focus on a different form of article analysis, altmetrics. This social impact of articles analysis will be necessary as a complement to the Twitter analysis previous made.

3.2.3. Importance of Scopus and articles in bibliometrics

This dissertation will use Scopus as the primary source of bibliometric data for the bibliometric analysis. Web of Science (WoS) was the most common and use source of bibliometric data, until 2004, the creation of the two most spread alternatives in

[7] Term introduce by (Andrés, 2009) to an application of quantitative methods to the analysis of scientific output. Firstly, the term was only used in the science of communication, however now is used in as a synonym of bibliometrics without the restriction of communication sciences (Andrés, 2009).

bibliometric field, Scopus by Elsevier and Google Scholar (GS) by Google (Norris and Oppenheim, 2007).

Scopus and WoS are the most similar databases of the three due to indexes used and the journals which comprise them. Most studies report the high correlation in most areas: Biomedical Research, Natural Sciences, Social Sciences, Engineering, Art and Humanities, etc. (Abrizah *et al.*, 2013; Mongeon and Paul-Hus, 2016) However, Social Sciences, the core of the topic SE, most articles are or exclusive from Scopus or appeared in both databases (Mongeon and Paul-Hus, 2016). Also to referred Scopus present a more updated database and due to this topic being more recent, a better solution is Scopus for the analysis (Abrizah *et al.*, 2013, Harzing and Alakangas, 2016; Mongeon and Paul-Hus, 2016; Vieira and Gomes, 2009).

Regarding GS is the most complete databases of the three regarding a number of articles and publications (Amara and Landry, 2012; Harzing and Alakangas, 2016; Mongeon and Paul-Hus, 2016). However, GS presents some problems which prevent an individual analysis without a comparison with one of the other bibliometrics databases. One of the problems is not having an index, such as SCImago Journal Rank in the case of Scopus (Abrizah *et al.*, 2013), to delimit which articles or journals are presented in the database as quality control (Ball and Tunger, 2006; Mongeon and Paul-Hus, 2016). Other problems studied by Jacsó (2005a, 2005b, 2008, 2009, 2010) are related to missing information (such as authors) or incorrect information (such as year, issue etc.).

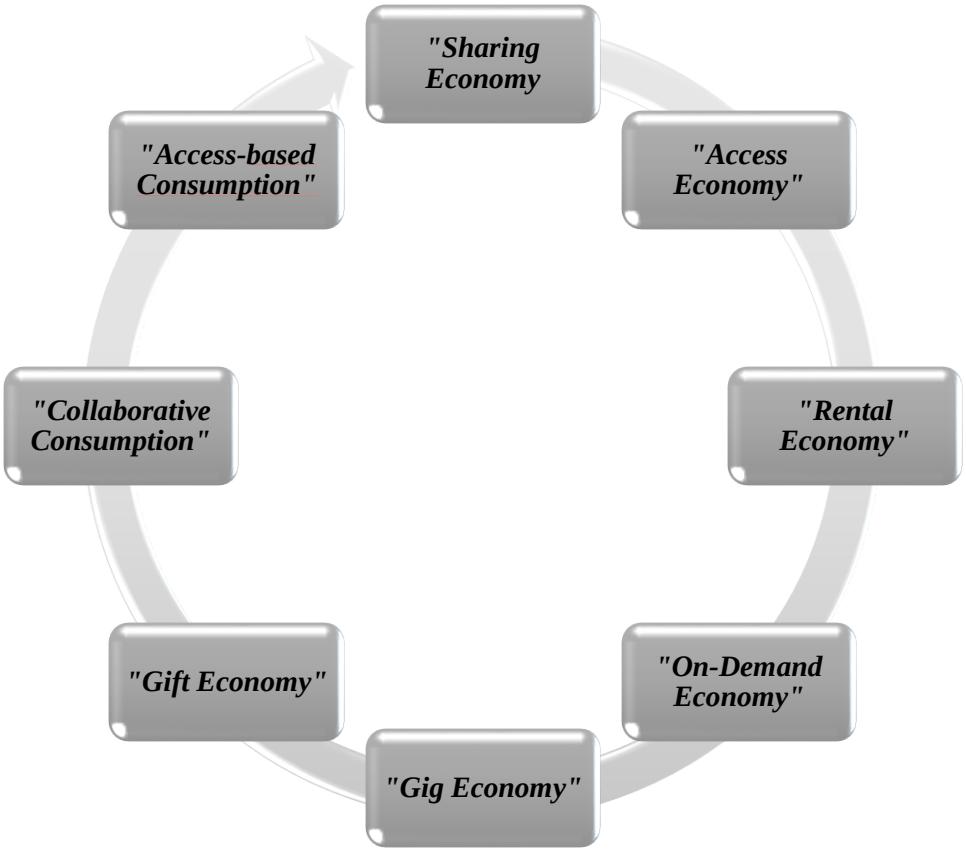
Regarding the decision to study articles from academic journals is motivated by the fact that this type of bibliometric data is considered the focal point of most bibliometric analysis (Hicks, 2004; Bar-Ilan, 2008). The reasons for this importance comes from the widespread and amount of articles in comparison to books (Hicks, 2004; Nederhof, 2006, 2011). Most of the bibliometric analysis is made with Scopus or WoS for metrics such as authors productivity, both Scopus and WoS lacks information in of some books (Mongeon and Paul-Hus, 2016). Furthermore, the SE topic is a recent topic of academic discussion, the research books on the topic are few and unessential in comparison to the journal articles. We decide to discard conference papers due to the lowest percentage citations and minimum age of cited literature (Lisée *et al.*, 2008).

3.3. Databases

3.3.1. Twitter's main Sharing Economy database

This study focuses on tweets and retweets regarding SE. The database for this analysis was created with a search query was made using the terms presented in Figure 2.

Figure 2- Evolution of the number of tweets between 2009 and 2017



Source: Author's source

For each of these terms was created a category for an isolated analysis with at least 20 tweets as an example, each example only features one term. It was also created two extra categories for "*Uber*" and "*Airbnb*"[8] also with at least 20 tweets as an example. For a better control of the data, the query was limit to English based tweets and also was added to the search query the expression ubercode as an exclude expression to eliminate every

[8] These categories will be analysed separately.

tweet of Uber's publicity. The data was collected in two different stages: first general data, searching all terms simultaneous for overall result of analysis featuring information of the number of tweets per day; list of top URLs, hashtags and mentions; topic wheel[9], post list[10] examples and author's data (number of tweets and most influential) for the total amount of tweets, the day of the first tweet and the days with the most number of tweets. The same data collection was replicated for every single term and both Uber and Airbnb tweets. Every single data collection was made separately and verified manually searching for errors[11].

Regarding a sentiment analysis of Airbnb, a new database will be created. The company transcended the terms related to SE to the public. For this reason, some people may tweet about Airbnb without knowing these are an example of sharing economies or the content of the tweet may concern another aspect of these companies, like controversies. These will be analysed in a sentiment analysis case later this dissertation, and the presentation of the respective database is presented in the next subchapter. The central database is composed of 1,910,411 tweets divided in the following order from May 23rd, 2008 until January 4th, 2018 (Table 4).

Table 4- Sharing Economy's Twitter Database

	Term			***Company***	
Number of tweeets	**"*Sharing Economy*"**	**"*Access Economy*"**	**"*Collaborative consumption*"**	**Airbnb**	**Uber**
	759,989	37,159	85,604	112,450	116,505
	"*Gift Economy*"	**"*Gig Economy*"**	**"*On-Demand Economy***		
	38,843	576,061	86,691		
	"*Peer economy*"	**"*Access-Based Consumption*"**	**"*Rental Economy*"**		
	33,048	54	64,890		

Source: Author's source using Crimson Hexagon (2018) database

[9] Text mining technique of Crimson Hexagon (2018) aggregation of topics using a sample of tweets 10,000 tweets.
[10] Random sample of 100 post made available by Crimson Hexagon (2018).
[11] Mainly by the analysis of the post list.

3.3.2. Airbnb sentiment analysis case

In the case of the mini-case, there was created one independent databases for Airbnb tweets, focusing on the sentiment analysis. The tweets were divided into three categories made with a minimum of 20 tweets as examples for each database, positive, negative and neutral[12]. The positive category represents positive news (such as favourable evaluations, profits and the arrival to new markets) regarding one of these companies or positive remarks about the companies by a Twitter user. The negative category includes negative news (for example, scandals and regulation wars) or negative comments about the companies. Lastly, the neutral regards neutral news regarding these companies. Table 5 represents some examples of tweets considered in the different categories. The Airbnb database includes 6,926,845 tweets from May 24th, 2008 to January 12th, 2018. This database was divided by the Crimson Hexagon database in the following (Table 6).

Table 5- Types of tweets considered tendentiously negative, positive and neutral

Category	***Positive***	***Neutral***	***Negative***
Examples	"*Airbnb raises $1.5 bn, valued at $25.5 bn: source http://t.co/SioFJE4VQ2*" by @jutipydidaga from June 28th, 2015 "*thanks for the birthday home, @airbnb https://t.co/NjlMbq7B8p* by @KylieJenner from August 15th, 2016	"*The who, what, when, where, why of #TripsOnAirbnb. https://t.co/mygGHVPBUz*" *by @Airbnb from in November 18th, 2016*	"*I hate Airbnb Seriously they just cancelled our reservation fml less than one month before our trip*" @aylinu from November 28th, 2017 "*Airbnb cracking down on illegal hosts in San Francisco https://t.co/do99ilXW4Z https://t.co/liu7MBVozP* " by @photojourn_rr from April 3rd, 2016

Source: Author's source using Crimson Hexagon (2018) database

[12] The categories represent a sentiment trend due to the fact that, firstly as a machine learning technique, there is no guarantee of flawless results and, the ambiguity sometimes of the language in a tweet.

Table 6- Airbnb's Twitter database

Number of tweets	Positive	Neutral	Negative
	3,754,973	1,950,616	1,231,256

Source: Author's source using Crimson Hexagon (2018) database

3.3.3. Bibliometrics' Sharing Economy database

The database in this analysis was extracted from Scopus and collects articles from 1978 to 21st of April of 2018. In total, the database includes 545 articles gathered in two phases: firstly, it was collected in October of 2017 articles from years previous of 2017 and, later, articles between 30th of March and 20th of April 2018 the articles from the year 2017. Between the same period information for the benchmark analysis was retreated, both the Atlmetric Attention Score and the Field-Weighted Citation Impact. The query used to produce the Twitter database was used to create this database, this implied that both would use in the abstracts, keywords or title using the same terms as the Twitter database (see Figure 2). This feature is crucial to make a comparison between the two analyses. Manually, every article was verified to ensure that the expressions applied were not missed used, that is, the database was only composed by articles regarding the topic and not articles that using the two words together were considered by the method. For research purposes what was considered journal articles by Scopus was the base of the analysis however the Economist, a newspaper from the United Kingdom with significance to the academic sphere was discarded. The distribution of articles per expression is presented in Table 7. Also mention that in June 2018 the database was once again verified and discard academic pieces previous considered articles and now considered by Scopus as conference papers, the symposium articles.

Table 7-Number of articles per term

	"*Sharing Economy*"	"*Collaborative Consumption*"	"*Gift Economy*"
Number of articles	330	99	139
	"*Gig Economy*"	"*On-Demand Economy*"	"*Access-Based Consumption*"
	25	13	18

	"*Peer Economy*"	"*Access Economy*"	"*Rental Economy*"
	6	9	3

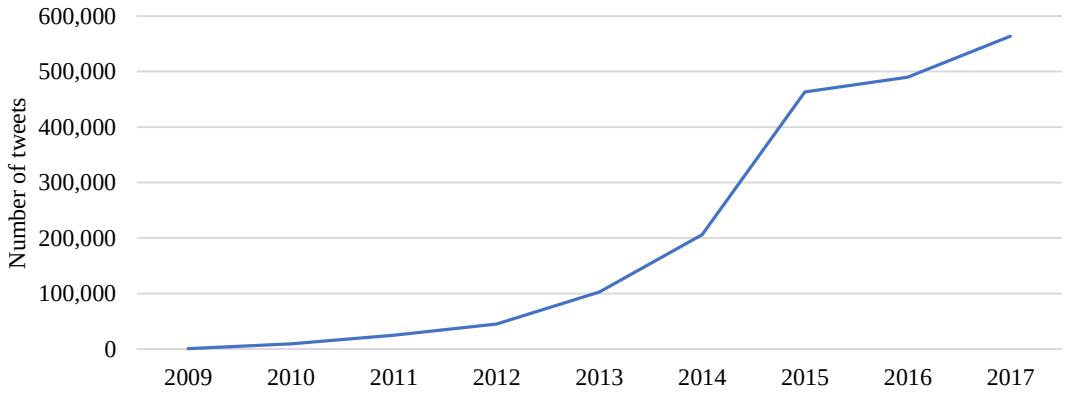
Source: Author's source using Elsevier B.V. (2018a) database

4. Sharing Economy on Twitter

4.1. Evolution of tweets regarding Sharing Economy

The number of tweets is an important metric of analysis. The number of tweets is related to the importance of a topic for the public (Jansen *et al.*, 2009). If an issue is increasing in tweets, this could be an indication of a growth in the importance of this topic in the social environment. The first tweet about this subject was released in 2009, as it is possible to uncertain by Figure 3. Throughout time the number of tweets regarding this subject has increased drastically between 2009 and 2015 and steadily from 2015 to 2017. The most significant increase, in numbers, occurs between 2014 and 2015. In just one year, the number of tweets increased from 205,787 to 463,019, an increase of 257,232 tweets. This analysis includes retweets.

Figure 3- Evolution of the number of tweets between 2009 and 2017



Source: Author's source using Crimson Hexagon (2018) database

4.2. Authors

Will focus on authors analysis in two aspects, firstly the number of tweets per user regarding SE and secondly the analysing the most relevant accounts of Twitter who tweeted or retweeted topics related to SE. With over 20,000 tweets and retweets regarding SE until 2017, the Rideshare Justice Project is the Twitter account that contributes the

most to the number of tweets of this topic. Rideshare Justice Project focuses on a fair implementation of technology in the transport industry with a focus on SE technologies (Rideshare Justice Project, 2018).

Table 8-Top Twitter users in posts regarding the Sharing Economy

Handler	User	Followers[13]	Description	Posts
@drivingjustice	Rideshare Justice Project	731	Project focus on fair implementation of technology in the transport industry (Rideshare Justice Project, 2018)	23,692
@economy_sharing	-	-	* Disable Twitter account as of 21/06/2016	9,783
@CahootHeroes	Cahoot Heroes	407	On on-demand workers platform (Cahoot heroes, 2018)	8,347
@CarNDriver1	Car-N-Driver	1,667	Online peer-to-peer marketplace that connects driver and travellers (Car-N-Driver, 2018)	4,694
@MashupTweet	Billee Howard	32,682	Chief Executive Officer (CEO) of BRANDthropologie (Howard, 2018)	4,585
@ajain31	Ajay DTLiar In Chief	15,918	Citizen	2,716
@jlievens	Jean Lievens	1,274	Deceased member of P2P Foundation (Bauwens, 2016)	2,613
@agami	Eddie Cejvan	2,000	Twitter profile of Eddie Cejvan, and investor and entrepreneur form Melbourne with focus on hardware and software systems (Cejvan, 2018)	2,223
@SharingEconRR	-	-	* Disable Twitter account as of 21/06/2016	2,215
@neighborrow	neigh*borrow	7,068	Company focusing on the free use of items under $500 for a maximum period of two weeks (neigh*borrow, n.d.)	1,636

Source: Author's source using Crimson Hexagon (2018) database

[13] As of 21 of June 2018.

For analysing influence will used the klout score metric. This metric analysis daily over 750 million profiles over nine different platforms: Twitter, Facebook, LinkedIn, Google +, Foursquare, Instagram, YouTube, Lithium Communities and Wikipedia (Rao *et al.*, 2015). Besides followers, the Klout Score also analyses the impact of each post form five dimensions: the characteristics of the audience who reacts to the post, the time leading to a reaction, where the reaction occurs, the original content that the reaction causes and the type of reaction (Rao *et al.*, 2015). Regarding SE, 20 Twitter users who tweeted or retweet regarding the topic gathered a klout score of 99 (Table 9).

Table 9- Twitter users which tweet or retweeted regarding Sharing Economy with klout score of 99

Author	Name	Media form	Followers[14]	Post text
@AP	The Associated Press	Newspaper	11,921,176	*RT @AP_Europe UK ruling against Uber has broad implications for entire gig economy. https://t.co/jDaYy9CTuD (11/11/2017)*
@BBCNews	BBC News (UK)	Televsion	8,950,265	*Fresh call for crackdown on gig economy https://t.co/kg9c1uDVn0 (20/11/2017)*
@CNN	CNN	Television	22,688,596	*America's job market will officially include workers in the "gig economy" next year https://t.co/bGOHItNLtC https://t.co/q5vLLG2zXI (26/01/2016)*
@Forbes	Forbes	Magazine	13,878,748	*These Are The Highest Paying Jobs In The Gig Economy https://t.co/oRPGcnaFhR (23/10/2017)*
@guardian	The Guardian	Newspaper	6,970,878	*It's time to face the facts about our digital world | John Naughton https://t.co/yIwVzu65vw (31/12/2017)*
@Harvard	Harvard University	University	568,198	*Research shows the Sharing Economy may not be equal for all users https://t.co/EqxHw5GQkU (04/01/2016)*
@HuffingtonPost	Huffington Post	Newspaper	6,124,557	*Bill Maher blasts today's "Sharing Economy" http://t.co/M7jPpuR3oY http://t.co/Z8FfX9M6PP (22/08/2015)*
@Independent	The Independent	Newspaper	2,100,836	*London bike courier wins 'gig economy' legal battle https://t.co/Pl0o88Cem1 (07/01/2017)*
@latimes	Los Angeles Times	Newspaper	2,418,949	*How Trump and an Obamacare rollback could affect the growing gig economy in 2017 https://t.co/BFO6Fqe1tn (29/12/2016)*
@Microsoft	Microsoft	Technology	8,283,518	*RT @MSFTnews #AI's Sharing Economy: Why Microsoft creates publicly available datasets and metrics https://t.co/8QQSF9dmwE https://t.co/83oLkTVpDs (17/11/2017)*
@nytimes	The New York Times	Newspaper	40,132,440	*RT @noamscheiber A gig economy company figured out how to get workers to work obsessively--and love the company even more for it. https://t.co/Usml8gZaj9 (12/11/2017)*

[14] As of 4th of January

@nytimesworld	New York Times World	Newspaper	1,856,226	"*In a job you can negotiate with the boss. We can't do that.*" *How will Europe regulate the gig economy? https://t.co/QeyhSbhJPK (02/10/2017)*
@nytopinion	NYT Opinion	Newspaper	648,409	*Are disabled people being left out of the booming Sharing Economy? https://t.co/46yA6ptluU (22/11/2017)*
@Reuters	Reuters Top News	News agency	18,274,676	*Eyeing sleepy office workers, China's 'Sharing Economy' opens nap capsules https://t.co/DvcraqoAFj https://t.co/uk2MLupwrU (11/07/2017)*
@TIME	TIME	Magazine	14,735,884	"*Hey! You! Get off of my cloud! And other tales from the family-data-Sharing Economy*" *https://t.co/LIRjchJHF9 (28/09/2017)*
@UN	United Nations	Intergovernmental organization	4,368,103	*.@ILO: Sharing Economy needs a new set of rules to make sure jobs it creates are good ones. http://t.co/6hSMb2sR3a http://t.co/ha3rnlNers (21/07/2015)*
@USATODAY	USA TODAY	Television show	3,464,995	*RT @USATODAYmoney Tax issues await Uber drivers, Airbnb landlords and other gig-economy workers https://t.co/P5hXNQVp64 https://t.co/pKDXc0ZANr (29/09/2017)*
@washingtonpost	Washington Post	Newspaper	9,731,799	*The next phase of the on-demand economy: Haircuts by delivery https://t.co/2UdS8Wr5Ze (10/04/2017)*
@WIRED	WIRED	Magazine	8,876,431	*RT @WIREDTransport Yep, the Sharing Economy looks pretty different from the window of a Gulfstream https://t.co/yG1HR5YCfd (18/05/2017)*
@WSJ	The Wall Street Journal	Newspaper	15,157,124	*RT @WSJCS Paid Program for VistaJet: High-net-worth consumers turn to the on-demand economy for luxury retail and services. https://t.co/gt7WIv4CL3 via @vistajet (24/11/2017)*

Source: Author's source using Crimson Hexagon (2018) database

4.3. Important events on Twitter

One of the questions of this analysis is to determine some of the most important events regarding SE on Twitter. As an answer to this question, there is a need to define what will consider an important event in this analysis using unspecified event detection techniques. Unspecified event detection techniques are techniques where there is no information about the event before the analysis, therefore are techniques to detect an event through the research analyse temporal patterns (Atefeh and Khreich, 2015). In this analysis will be analysed what the first tweet, the two days with the highest number of tweets and the top three tweets with the most retweets were. In total will be examined six different events, presented in Table 10.

Table 10- Important events on Twitter

Important event	Story[15]	Term
First Tweet	Mini-documentary about Mali gift-giving *Dama*	"*Gift Economy*"
Second day with the most tweets	Impact of Sharing Economy in marketing	"*Sharing Economy*"
Day with the most tweets	Release of Matthew Taylor, *Good work: The Taylor review modern working practices* report and comments by Owen Jones and Theresa May	"*Gig Economy*"
Third highest tweet in terms of retweets	Food delivery project Swiggy raises 35 million dollars	"*On-Demand Economy*"
Second highest tweet in terms of retweets	Kickstar project for application of Sharing Economy in commercial kitchen	"*Sharing Economy*"
Highest tweet in terms of tweets	Negative backlash for a Fiverr campaign	"*Gig Economy*"

Source: Author's source using Crimson Hexagon (2018) database

[15] Appendix 7 presents all the stories in detail.

This group of stories is well diverse in multiple parameters, firstly the term used, the six stories used four different terms (Sharing Economy, gig economy, on-demand economy and gift economy). Regarding the stories itself, three centres in companies or project of applications of SE in different markets (commercial kitchen, food delivery, gig economy platform) and two stories focus on the impacts of the SE, one in marketing the other in the workers.

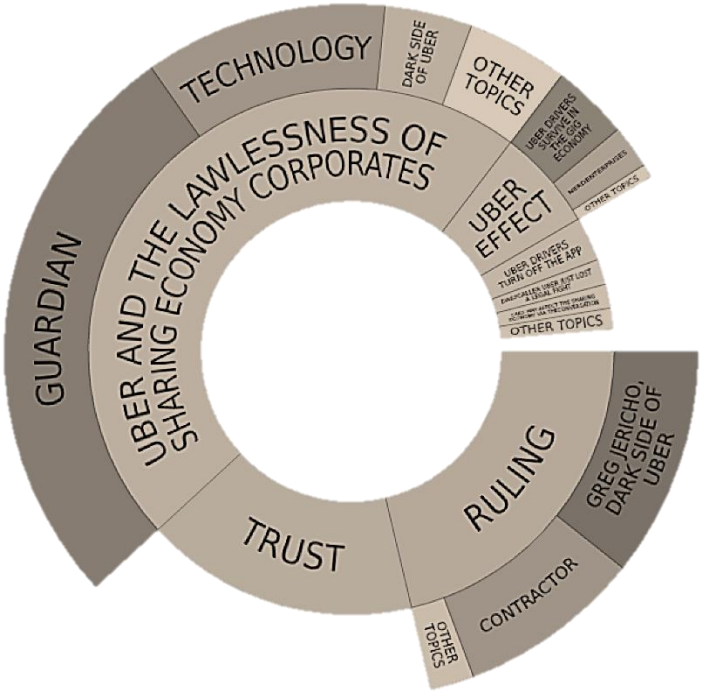
4.3.1. Important events of Uber and Airbnb in the database

Uber and Airbnb are some of most prominent companies in Sharing Economy in its respective markets, Uber with 1,250 million dollars at 2018 and Airbnb with 447.8 million dollars in 2017 with venture capital (The Next Web, 2018). Despite, the database not including all the tweets from both companies it still gives important data about the company and the stories through the years. Will focus what was associated with Sharing Economy regarding this two companies, analysing topic wheels, a feature of Crimson Hexagon which provides the most important topics of discussion on Twitter of a given topic. The same feature will be use on the sentiment analysis of Airbnb. Uber is a transportation company created by Travis Kalanick and Garrett Camp which start operation in the city of San Francisco in 2009 (Uber, 2018). The first name of the company was UberCab and in 2010 the name was shortened to Uber (Uber, 2018). Uber mission is to solve the question of "*how do you get a ride at the push of a button*" (Uber, 2018). Uber[16] is a company with 75 million riders, 3 million drivers, 4,000 million trips in 2017 in 65 countries (Uber, 2018) As provided by Figure 4, the topics related to Uber and SE center on the technology side, trust and three topics will focus more deeply, two articles from the Guardian: "Uber and the lawlessness of 'Sharing Economy' corporates" and "The dark side of Uber: why the Sharing Economy needs tougher rules" and the Uber effect. "Uber and the lawlessness of 'Sharing Economy' corporates" focus on the ways the SE companies circumvent the law, giving examples of multiple companies such as Uber when use model Kate Upton to protest the mayor Bill de Blasio law of limiting the number Uber cars and Uber continue to operate with UberPop regardless of being illegal in some cities (Pasquale and Vaidhyanathan, 2015). "The dark side of Uber: why the Sharing Economy needs tougher rules" targets the principal conclusions of Minifie (2016)

[16] See Appendix 8 for an overall look at the most important event in Uber history.

regarding the concern for regulation of the SE workers due to the possibility of an overall reduce wage situation if the model continues to spread (Jericho, 2016). This has been call the Uber Effect[17] (Berger *et al.*, 2018).

Figure 4- Topic wheel for Uber tweets in the database



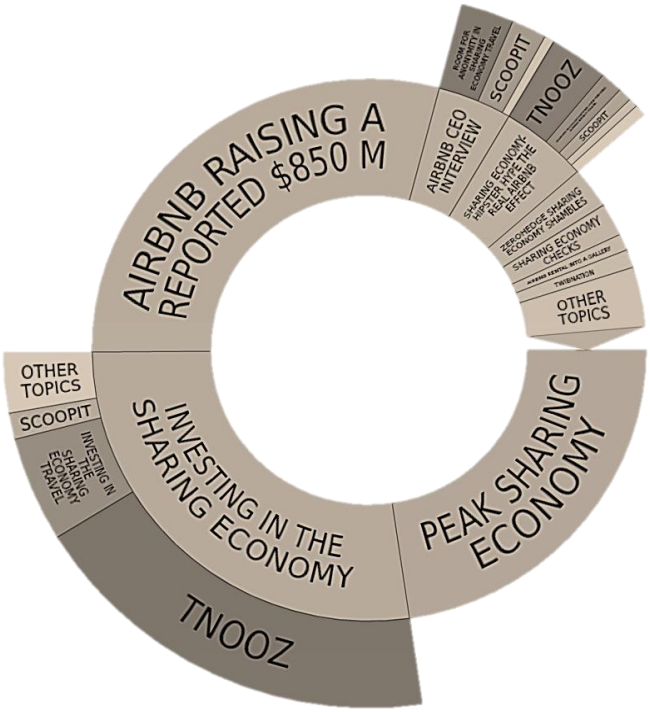
Source: Crimson Hexagon (2018)

Airbnb[18] describes itself as a "*global travel community that offers magical end-to-end trips, including where you stay, what you do and the people you meet*" (Airbnb, 2018). This new definition differs from the definition from the company in 2003[19] that focussed on the marketplace for and the core business of accommodation. Nonetheless, Airbnb is basically a marketplace for owners to rent their accommodations places to tourists (Guttentag, 2015). Authors such as Guttentag (2015) considered the most prominent company of this type of renting (short-term renting of primary homes), nonetheless, with competitors such as Windu, 9flats, HouseTrip or CouchSurfing.[20]. Regarding the topic

[17] This aspect of sharing economy is also being called the false hope of sharing economy (Berger *et al.*, 2018).
[18] See Appendix 9 for an overall look at the most important events in Airbnb history.
[19] "*a trusted community marketplace for people to list, discover, and book unique accommodations around the world*" (Guttentag, 2015: 1193).
[20] Windu and 9flats focus on primary homes as Airbnb, while HouseTrip focus on vacation homes and CouchSurfing is a free of charge hospitality network (Guttentag, 2015).

wheel (Figure 5) of Airbnb there are four aspects to highlight, an interview with the CEO of Airbnb, raised of 850 million dollars in funding, one article from Mashable regarding what as been describe as the "*Airbnb for Airbnb*" (Plautz, 2014) and an article from Tnooz written by the CEO of Skoosh reporting the benefits of investing in business models such as Airbnb. Starting with the raised of capital, this capitalization of 850 million in 2016 led to a 30,000 million dollars evaluation of the company, which was an important milestone (Newcomer and Huet, 2016). The inverview with CEO of Airbnb and funder Brian Chesky focus on the question of how Airbnb creates trust by erasing the anonymity, creating confidence. The piece from Mashable "Is this peak Sharing Economy? Presenting the Airbnb for Airbnb" presents the platform Can I Stay With You While I Rent My Place On Airbnb?, which is a project for people funding a house when they rent their personal house in Airbnb. Lastly, the piece of Tnooz focus on the economic benefits such as reduction of cost of companies such as Airbnb which use the SE business model, in market such as accommodation and the way that this market has change to adapt to Airbnb (Skoosh, 2014).

Figure 5- Topic wheel for Airbnb tweets in the database

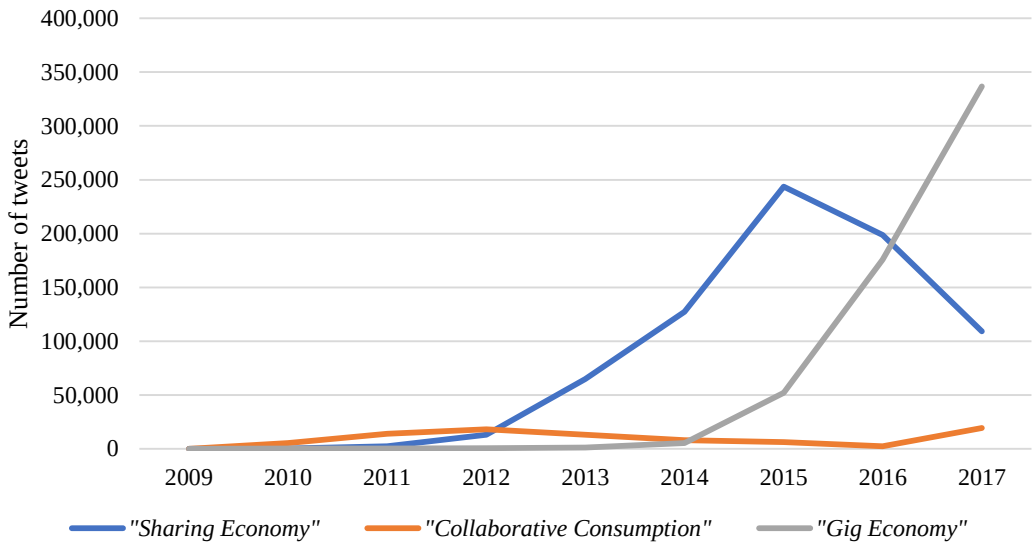


Source: Crimson Hexagon (2018)

4.4. Evolution of terms of Sharing Economy

A critical discussion of this dissertation is to understand the evolution of the different terms regarding SE on Twitter. Analysing Figure 6 and Appendix 10, there were three key terms *"sharing economy*", "*collaborative consumption*" and "*gig economy*". In different periods of analysis, each term was the most use on Twitter. Between 2009 and 2012, the expression more used is "*collaborative consumption*". From 2012 to 2016, there is a dominance of the term *"sharing economy*", which picked in 2015. Moreover, finally, in the last two years of analysis, 2016 to 2017 the terms with more tweets related to is "*gig economy*", which since 2015 have witnessed significant growth. This information is presented in Figure 6 (see Appendix 10 for the rest of the terms).

Figure 6- Evolution of the main terms regarding Sharing Economy in Twitter



Source: Author's source using Crimson Hexagon (2018) database

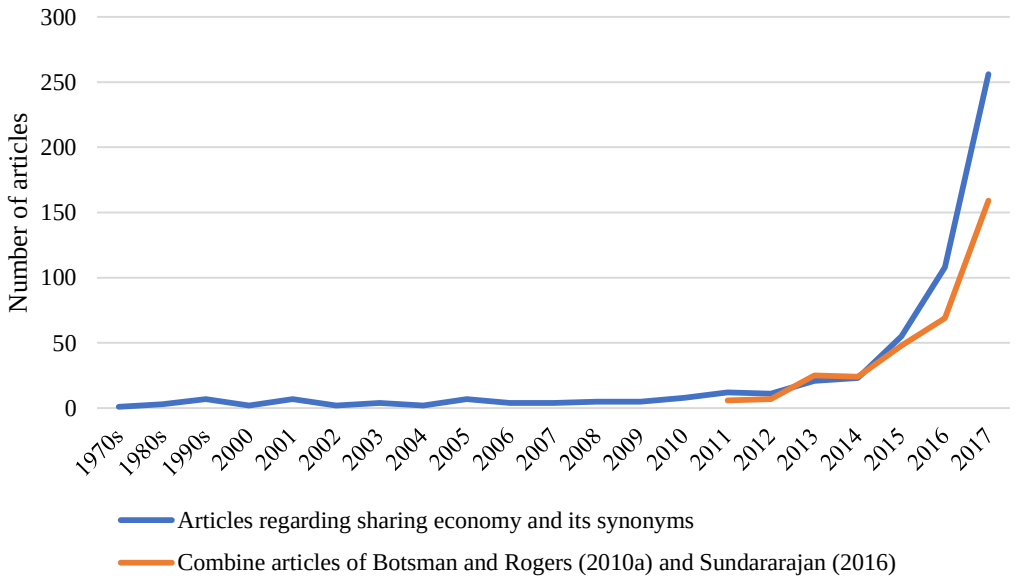
5. Sharing Economy in bibliometrics

This chapter will focus on some components of a standard bibliometric analysis: evolution of the number of articles and the number of citations; an author's analysis and journal analysis. This analysis was made to show the growth and the overall look of what has been the scientific production of articles regarding this topic.

5.1. Evolution of the number of articles

The first bibliometric analysis regarding SE and its synonyms examined how the number of publications evolved throughout the years. As seen in Figure 7, the number of SE publications started in the decade of 1970s, with an article published in the *American Behavioral Scientist* by Felson and Spaeth (1978). This previously mentioned article focus on the sharing consumption of goods and services and it is considered the first literature is mentioning the term "*collaborative consumption*" (Albinsson and Yasanthi Perera, 2012). The number of articles starts to increase at a quicker rate in 2015 and in 2017 it is more than quadruple the number of articles in 2014. The book of Botsman and Rogers (2010a) and Sundararajan (2016) follows a similar pattern to the number of articles. It is also important to mention that until April 20th, 2018 Scopus presented 97 articles concerning this topic which reinforce the continued and increasing academic importance of this topic.

Figure 7-Evolution of the number of articles and comparison with Botsman and Rogers (2010a) and Sundararajan (2016)



Source: Author's source using Elsevier B.V. (2018a) database

5.2. Authorship

Regarding the authorship, two different criteria was introduced, the number of articles produced concerning the topic of analysis and the most cited authors. In both analyses, each contribution and each citation were considered the same way, regardless if the author is the first author or not. The position of the author's name in the article may be explained beyond his portion of contribution, as the recognition of the author or a choice of alphabetical order (Andrés, 2009).

Regarding the number of articles participated, Karen Lijia Xie was the only author who produced until 2017, 5 articles about the SE, according to Table 11, all of which in the last year of analysis. Karen Xie is an Assistant Professor of Hospitality Management at Daniels College of Business in the University of Denver with a research focus on the usage technologies and data analytics in a business problem with subareas such as digital transformation in services and platform-based market (Daniels College of Business, 2018).

Table 11- Top authors per number of articles

Authors	Number of articles	H index[21]	Studies participated	Areas of expertise
Xie, Karen Lijia	5	8	Xie and Kwok (2017) Chen and Xie (2017) Xie and Mao (2017) Wu *et al.* (2017) Young *et al.* (2017)	*Business, Management and Accounting* *Computer Science* *Decision Sciences* *Social Sciences*
Martin, Chris J.	4	6	Martin *et al.* (2017) Martin and Upham (2016) Martin (2016) Martin *et al.* (2015)	*Psychology* *Business, Management and Accounting* *Engineering* *Computer Science* *Social Sciences* *Environmental Science* *Energy*

[21] H-index or Hirsch index is a metric of scientific output of an author or journal. The metric means that the author/journal have at least h articles with h citations (Andrés, 2009).

				Mathematics *Physics and Astronomy* *Economics, Econometrics and Finance* *Medicine*
Shaheen, Susan A.	4	24	Shaheen *et al.* (2016) Shaheen and Chan (2016) Shaheen and Bansal (2015) Shaheen *et al.* (2012)	*Engineering* *Social Sciences* *Computer Science* *Energy* *Environmental Science* *Decision Sciences* *Business, Management and Accounting* *Economics, Econometrics and Finance* *Physics and Astronomy* *Mathematics*
Schor, Juliet B.	4	15	Frenken and Schor (2017) Schor (2017) Schor and Attwood-Charles (2017) Schor *et al.* (2016)	*Social Sciences* *Business, Management and Accounting* *Economics, Econometrics and Finance* *Environmental Science* *Arts and Humanity* *Agricultural and Biological Sciences* *Energy* *Medicine* *Earth and Planetary Science*

Source: Author's source using Elsevier B.V. (2018a) database

The most cited authors are Doug Guthrie and Russel Belk according to Table 12. Gutherie Doug was a former Dean and Professor of International Business and Management at the George Washington University whose research focused on the economic reform in China, leadership, corporate governance and corporate social responsibility (HuffPost, n.d.; Palin, 2013). Russel Belk[22] is a Professor of Marketing and Chair in Marketing of Kraft Foods Canada, and his research focuses on possessions, collecting, gift-giving, sharing and materialism (The Schulich School of Business - York University, n.d.). Belk was the author with more citations gathered from three articles (Belk, 2014b, 2014a, 2017) being the most cited Belk (2014a).

[22] We should mention that due to Belk (2010) uses only the term sharing is not included in the database.

Table 12- Top authors per number of citations

Authors	Citations	H index[23]	Number of articles	Studies participated	Studies participated
Guthrie, Doug J.	319	10	1	Guthrie (1998)	*Social Sciences* *Business, Management and Accounting* *Engineering* *Computer Science*
Belk, Russell V.	271	29	3	Belk (2014a) Belk (2014b) Belk (2017)	*Business, Management and Accounting* *Economics, Econometrics and Finance* *Psychology* *Social Sciences* *Arts and Humanities* *Agricultural and Biological Sciences* *Veterinary*
Bergquist, Magnus	236	7	1	Bergquist and Ljungberg (2001)	*Computer Science* *Social Sciences* *Business, Management and Accounting* *Engineering* *Medicine* *Psychology* *Decision Sciences* *Nursing* *Health Professions*
Ljungberg, Jan	236	8	1	Bergquist and Ljungberg (2001)	*Business, Management and Accounting* *Computer Science* *Social Sciences* *Decision Sciences* *Engineering* *Mathematics*
Hamari, Juho	233	18	2	Hamari (2013) Hamari *et al.* (2016)	*Computer Science* *Psychology* *Social Sciences* *Arts and Humanities* *Business, Management and Accounting* *Engineering* *Economics, Econometrics and Finance* *Decision Sciences* *Mathematics*

Source: Author's source using Elsevier B.V. (2018a) database

[23] H-index or Hirsch index is a metric of scientific output of an author or journal. The metric means that the author/journal have at least h articles with h citations (Andrés, 2009).

5.3. Journals

As seen in Table 13, eleven journals have more than six articles regarding SE and its related terms. The two journals with most number of articles are *International Journal of Contemporary Hospitality Management* with 12 articles, a management of hospitality based journal, follow closely by *Technological Forecasting and Social Change*, a journal focused on foresight and practice in relation to social, environmental and technological factors (Elsevier B.V., 2018b, 2018c). Most of the articles that form this database came from journals in Business and International Management or Geography, Planning and Development[24] (see Appendix 11).

Table 13- Top journals regarding Sharing Economy in a number of articles

Journal	Number of articles	H index[25]	SJR[26]	Areas and subareas
International Journal of Contemporary Hospitality Management	12	60	1.452	**Business, Management and Accounting** • *Tourism, Leisure and Hospitality Management*
Technological Forecasting and Social Change	11	86	1.380	**Business, Management and Accounting** • *Business and International Management* • *Management of Technology and Innovation* **Psychology** • *Applied Psychology*
First Monday	10	60	0.563	**Computer Science** • *Computer Networks and Communications* • *Human-Computer Interaction* **Social Sciences** • *Law*
Journal of Cleaner Production	10	132	1.467	**Business, Management and Accounting** • *Strategy and Management* **Energy**

[24] The score was made by the number or articles and not by the number of journals therefore multiple articles from the same journal inflates the areas.
[25] H-index or Hirsch index is a metric of scientific output of an author or journal. The metric means that the author/journal have at least h articles with h citations (Andrés, 2009).
[26] Scimago Journal Rank

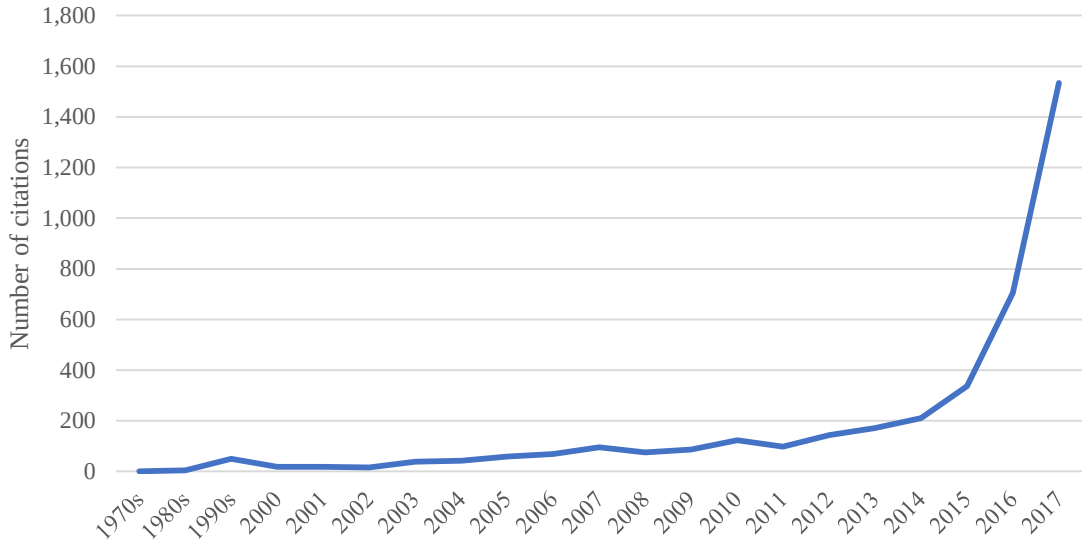
				• *Renewable Energy, Sustainability and the Environment* **Engineering** • *Industrial and Manufacturing Engineering* **Environmental Science** • *Environmental Science (miscellaneous)*
Cambridge Journal of Regions	9	32	0.767	**Economics, Econometrics and Finance** • *Economics and Econometrics* **Social Sciences** • *Geography, Planning and Development* • *Sociology and Political Science*
Environmental Innovation and Societal Transitions	8	24	2.140	**Energy** • *Renewable Energy, Sustainability and the Environment* **Environmental Science** • *Environmental Science (miscellaneous)* **Social Sciences** • *Social Sciences (miscellaneous)*
Journal of Business Research	7	144	1.260	**Business, Management and Accounting** • *Marketing*
Sustainability (Switzerland)	7	42	0.537	**Energy** • *Renewable Energy, Sustainability and the Environment* **Environmental Science** • *Management, Monitoring, Policy and Law* **Social Sciences** • *Geography, Planning and Development*
Annals of Tourism Research	6	132	2.262	**Business, Management and Accounting** • *Tourism, Leisure and Hospitality Management* **Social Sciences** • *Development*
Journal of Marketing Channels	6	16	0.367	**Business, Management and Accounting** • *Marketing*
European Journal of Risk Regulation	6	12	0.309	**Social Sciences** • *Law* • *Safety Research*

Source: Author's source using Elsevier B.V. (2018a) database and information from Scimago Lab (2018)

5.4. Citation analysis

Of the 545 articles from the database, 289 articles gathered at least one citation excluding self-citations[27] until 2017. The decision to exclude self-citations was made due to the potential artificial inflation of an article, and therefore, the topic. The evolution of citations follows the same tendency of the number of articles, as presented in Figure 8. The database gathered 3,892 citations until the year 2017.

Figure 8-Evolution of the citations of the articles in the database



Source: Author's source using Elsevier B.V. (2018a) database

5.5. Content analysis

This section will focus on the content of SE articles. It starts with a term analysis, where the results presented in the Twitter analysis of the previous report are compared with the articles with more citations in a study of article's bibliometric propagation. Afterwards, it will be examined the field importance of an article in comparison to the social significance of the same.

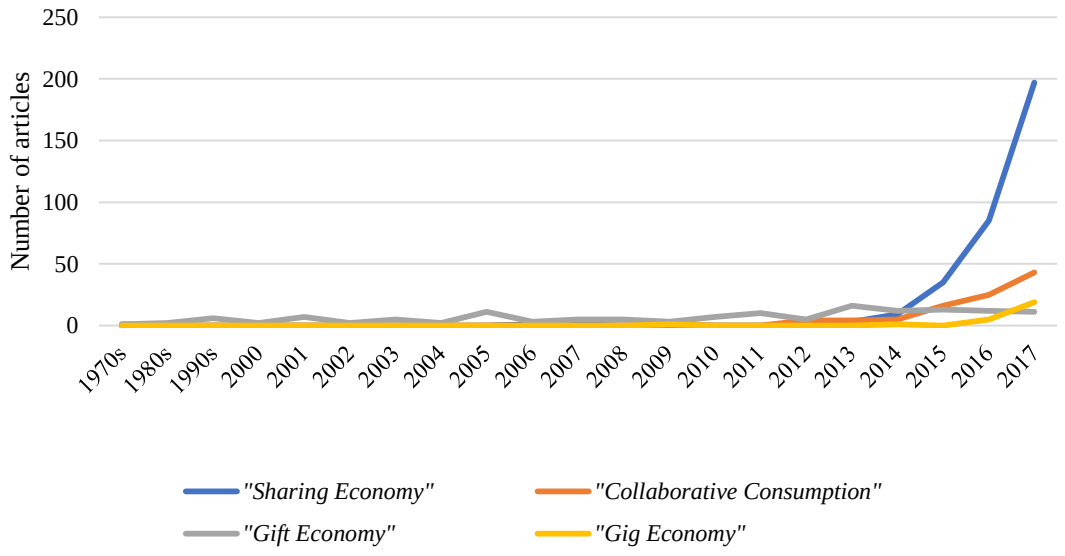
[27] Self-citations is when one of the co-authors of an academic piece is cited in that particular academic piece (Andrés, 2009).

5.5.1. Term analysis

This subchapter will focus on how the terms related to SE evolve throughout the years in abstracts, keywords and titles of articles. In opposite to the Twitter analysis, this subchapter will examine, firstly, the usage of the terms in the articles, regardless if is used multiple terms. Secondly, in the multiple terms articles, it is discarded the synonym considered in the search query to analyse the power of the terms used. The reason for these second analysis not be made in Twitter is due to the limit number of characters difficult the number of synonyms in a tweet, therefore users usually only use one synonym peer tweet.

Contrary to Twitter, in bibliometrics, the term "*gift economy*" is predominance gathering the second place regarding the number of articles. From the decade of the 1990s to 2014, "*gift economy*" was the term with more articles. After 2015, both "*sharing economy*" and "*collaborative consumption*" surpass "*gift economy*". From 2015 to 2017, "*sharing economy*" became the term most used in articles in Scopus. In 2017, "*gig economy*" surpasses "*gift economy*" as the third most used term, as seen in Figure 9 (see Appendix 12 for the rest of the terms).

Figure 9- Evolution of the main terms regarding Sharing Economy in bibliometrics



Source: Author's source using Elsevier B.V. (2018a) database

When analysing articles which only use one of the synonyms, the gap is more significant in "*collaborative consumption*", which means that this expression is most used by

combining with one of the others. While in the opposite spectrum, the gift economy is only used residually merging with one of the phrases. "*Sharing economy*" and "*gift economy*" are more robust expression then "collaborative consumption" or "*gig economy*" because are primarily utilised isolated from another expression in title, abstract or keywords (Table 14).

Table 14- Gap between multiple usages of terms and singular

Term	Sharing Economy	Collaborative Consumption	Gift Economy	Gig Economy
Gap	-19.46%	-56.03%	-0.71%	-32.35%

Source: Author's source using Elsevier B.V. (2018a) database

5.5.2. Most cited articles regarding Sharing Economy

When looking at the top ten articles by citations (discarding self-citations) regarding SE (Appendix 13) some already mentioned in the review literature chapter: Hamari *et al.* (2016), Albinsson and Perera (2012) Bardhi and Eckhardt (2012), Belk (2014a) and Hamari *et al.* (2016). Instead of analysing each of the ten articles in detail, it was decided, to focus on the ones not mentioned in previous chapters and then find the point of connections between the articles. Regarding the articles not mentioned in previous sections, Hamari (2013) focus on the gamification, "*the use of game design element of marketing purposes*" (Hamari, 2013: 236), using a peer-to-peer trading platform as an example. The others three articles focus on gift economy application in open sources communities (Barbrook, 1998; Bergquist and Ljungberg, 2001; Zeitlyn, 2003) and the transition to the free market economic model in China (Guthrie, 1998; Yang, 1989).

Scrutinizing the top ten articles regarding citations, most of the articles in the top ten (seven articles) use only one term regarding SE (in abstracts, title or keywords), while the others preferred to use multiple ones (Table 16). The two terms more used in these articles are the collaborative consumption and gift economy (Table 4). The terms "*gift economy"* and "*access-based consumption"* were the terms used in solo, while "*collaborative consumption"* and "*Sharing Economy"* were used as synonyms in both Hamari *et al.* (2016) Belk (2014a).

Table 15- Term analysis of the top 10 articles regarding citations

<table>
<tr><td rowspan="2">Regarding the number of terms used (title, keywords and abstract)</td><td colspan="2">Use only one term</td><td colspan="2">Uses multiple terms</td></tr>
<tr><td colspan="2">Albinsson and Perera (2012)
Bardhi and Eckhardt (2012)
Bergquist and Ljungberg (2001)
Guthrie (1998)[28]
Hamari (2013)
Zeitlyn (2003)
Yang (1989)
Barbrook (1998)</td><td colspan="2">Belk (2014a)
Hamari et al. (2016)</td></tr>
<tr><td rowspan="2">Regarding terms used</td><td>“Access-based consumption”</td><td>“Collaborative consumption”</td><td>“Gift economy”</td><td>“Sharing economy”</td></tr>
<tr><td>Bardhi and Eckhardt (2012)</td><td>Albinsson and Perera (2012)
Belk (2014a)
Hamari (2013)
Hamari et al. (2016)</td><td>Bergquist and Ljungberg (2001)
Guthrie (1998)
Yang (1989)
Zeitlyn (2003)
Barbrook (1998)</td><td>Belk (2014a)
Hamari et al. (2016)</td></tr>
<tr><td rowspan="2">Regarding the title</td><td colspan="2">Use a term in the title</td><td colspan="2">Do not use a term in the title</td></tr>
<tr><td colspan="2">Bardhi and Eckhardt (2012)
Belk (2014a)
Hamari et al. (2016)
Zeitlyn (2003)
Barbrook (1998)</td><td colspan="2">Albinsson and Perera (2012)
Bergquist and Ljungberg (2001)
Guthrie (1998)
Hamari (2013)
Yang (1989)</td></tr>
</table>

Source: Author’s source

Regarding the market segments, four segments were studied in six of the top ten most cited articles regarding SE: transportation, software development, peer-to-peer trading platforms and accommodation. This information was extracted from Table 17. The top 10 articles represent 38.6% of the total of citations in the database.

[28] Presented abstract used for research proposes in Scopus, and other bibliometric databases such as Research Gate was a summarised version of the concluding chapter of the article. The article itself does not have an abstract.

Table 16-Method and market analysis of the top 10 most cited articles

	Article	Market segment	Platform
Market centred articles	Barbrook (1998)	Software development	Non-applicable
	Bardhi and Eckhardt (2012)	Transportation (carsharing)	Zipcar
	Bergquist and Ljungberg (2001)	Software development	Non-applicable
	Hamari (2013)	Peer-to-Peer trading (goods, services, rides or spaces)	Sharetribe
	Hamari *et al.* (2016)	Peer-to-Peer trading (goods, services, rides or spaces)	Sharetribe
	Zeitlyn (2003)	Software development	Non-applicable

Source: Author's source

6 Altmetrics analysis

6.1. Scientific production and social media

Social media and scientific output are not two disconnected fields. Even in the database of these analyses, there are points of connection, in both areas. For example, the first tweet regarding collaborative consumption was released on July 27th, 2009 by the Twitter handler @charmermark: "*@monkchips it is your central dilemma/opportunity right now mate. Roo Rogers calls it 'collaborative consumption'*." And it is a clear reference to the academic work of Roo Rogers in the site www.collaborativeconsumption.com (Kelly, 2017). By 2018 this website is non-available. In the matter of fact, 659 articles caused 2,465 tweets[29]. This impact of scientific production in social media is called Altmetrics. This was a term introduced in 2010 by a tweet from Jason Priem in relations to article's level metrics ("*I like the term #articlelevelmetrics, but it fails to imply *diversity* of measures. Lately, I am liking #altmetrics.*") (Kelly, 2017). This tweet and subsequent "Altmetric Manifesto" evolved to a form a Social Media based analysis of scientific output (Rosenkrantz *et al.*, 2017).

[29] Information collected between 30th of March 2018 to 20th of April 2018 according to Altmetric (2018b).

6.2. Field Importance and social importance metrics

The second analysis recording this content will focus on a benchmark analysis regarding two different variables: the importance of an article in its field and the overall social attention of an article. The two indexes used for this analysis are the Altmetric Attention Score and Field-Weighted Citation Impact.

6.2.1. Altmetric Attention Score

The Altmetric Attention Score (AAS) is a weighted metric of the total of direct mentions of an article in online platforms (Altmetric, 2018a). This score is related to an automated algorithm where each weighted score are represented in Appendix 14 (Altmetric, 2018a). The scale of AAS is an integer. Therefore two articles could have the same AAS score of one and one of them have three Facebook mentions and the other only one (Altmetric, 2018a). The metric also has some specifies for each counted online platform. In Twitter, for example, retweets have a lower score (0.85) then a typical tweet (1) and each user who tweets is analysed regarding bias to the mention of a tweet, such as, if a person tweets a lot of one journal (Altmetric, 2018a). Also, concerning newspapers, national mainstream newspapers have a more prominent contribution to the score than niche publications (Altmetric, 2018a).

6.2.2. Field-Weighted Citation Impact

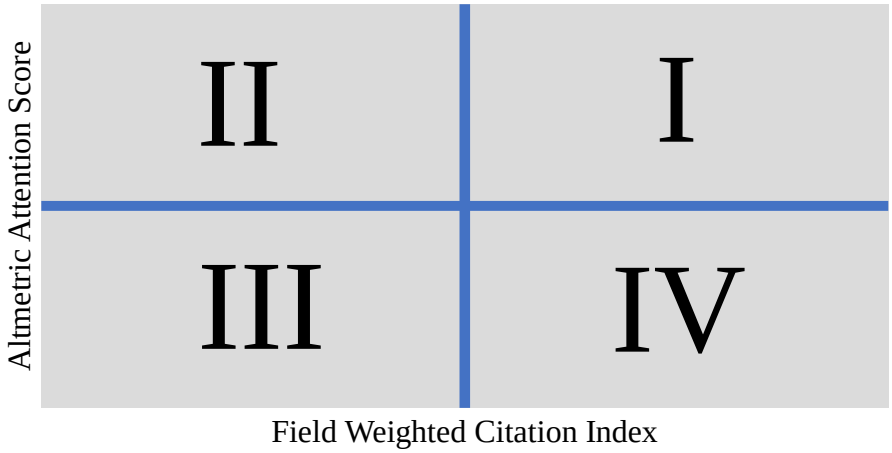
As the analysis in previous chapters, SE and its synonyms gathered the scientific attention of multiple areas. The different fields have different practices regarding citations; there are areas where, on average, an article gathers more mentions than others (Colledge, 2017). To solve this problem, instead of considered the citations liquid of self-citations, to measure the academic field impact of an article, will use Field-Weighted Citation Impact (FWCI). The FWCI is a ration of comparison of an article to similar publications (Colledge, 2017). The citations are collected from three years after the article is published and uses information from the three primary bibliometric databases: Scopus, Web of Science and Google Scholar (Colledge, 2017). The metrics use the harmonic average and take into consideration if an article as multiples fields (Colledge, 2017). The result of the FWCI is related to 1, meaning 1 the article receive the same amount of citations as the

global average of that particular field, therefore values lower than 1 performs smaller than the area (e.g. if an article score 0.8 it delivers 20% less than the area) and higher than 1 performs higher in terms of citation then the field (e.g. a rating of 1.2 meant that the article gathered 20% more mentions than the correspondent field) (Colledge, 2017).

6.3. Field importance and social importance benchmark analysis

Selecting the top 30 articles (Appendix 15) in each metric will create a division of this articles in four different groups represented in Figure 10. Firstly, there is a significant difference in the first thirtieth position in both metrics, and the reason for these analyses being a division in four different groups the origin will be the median of the top 30 articles in each parameter. The articles of group I are articles with both considerable field attention and social attention. In group II articles with considerable social attention but not as significant field attention. Group III is the reverse of group, considerable field attention and not as considerable social attention. Group IV is the article with not as much field or social recognition as of the others four groups. The median of both metrics is a good benchmark for this analysis because the results of 40 for the AAS metric is significantly higher than 20 (a considerable a generable score higher social performance article then its contemporaries (Altmetric, 2017), and the FWCI median of 13.96 means then an article gathers fourteen times more citations than the average of its respective field.

Figure 10-The division of articles in the social/academic analysis



Source: Author's source

6.1. First quadrant

The benchmark for AAS is 38.5 and for the FWCI is 13.255. For this analysis will focus on group I (articles with AAS higher than 38.5 and FWCI higher than 13.255), group II (articles with AAS higher than and 38.5 and FWCI lower than 13.255) and group IV (articles with AAS lower than 38.5 and FWCI higher than 13.255). Group one is composed by 5 articles, all of which use a term in their titles and used the term "*sharing economy*", and 3 of the articles used one other term, either "*collaborative consumption*" or "*collaborative economy*". Regarding the market base articles, there are three articles in this five-article groups: two for the accommodation market and one in the general peer-to-peer trading. The accommodation centred articles both used Airbnb as the main platforms of study and Sharetribe peer-to-peer trading platform. This information is extracted from Table 19.

Table 17-Term and market analysis of the first quadrant articles

Regarding the number of terms used (title, keywords and abstract)	**Use only one term**	**Uses multiple terms**	
	Edelman *et al.* (2017) Ert *et al.* (2016) Frenken and Schor (2017)	Hamari *et al.* (2016) Martin (2016)	
Regarding terms used	**"*Collaborative Consumption*"**	**"*Collaborative Economy*"**	**"*Sharing Economy*"**
	Hamari *et al.* (2016) Martin (2016)	Martin (2016)	Edelman *et al.* (2017) Ert *et al.* (2016) Frenken and Schor (2017) Hamari *et al.* (2016) Martin (2016)
Regarding the title	**Use a term in the title**		
	Edelman *et al.* (2017) Ert *et al.* (2016) Frenken and Schor (2017) Hamari *et al.* (2016) Martin (2016)		
Market centred articles	**Article**	**Market segment**	**Platform**
	Edelman *et al.* (2017)	Accommodation	Airbnb
	Ert *et al.* (2016)	Accommodation	Airbnb
	Hamari *et al.* (2016)	Peer-to-Peer trading (goods, services, rides or spaces)	Sharetribe

Source: Author's source

6.2. Second quadrant

In the second group, the social attention centred articles, all ten articles only used on the term, with the term most used also being the "*sharing economy*" with four articles. The other terms also used in this group are "*access-based consumption*", "*gift economy*", "*gig economy*" and "*on-demand economy*". Regarding the title, the same number of articles

used a term on the title is the same in comparison to articles which do not use a term on the article. This information is presented in Table 19.

Table 18-Term analysis of the second quadrant

Regarding the number of terms used (title, keywords and abstract)	**Use only one term**				
	Abrahao *et al.* (2017) Bardhi and Eckhardt (2012) Cohen and Kietzmann (2014)		Debenedetti *et al.* (2014) Graham *et al.* (2017) Harvey *et al.* (2017)		Mewburn and Thomson (2013) Ossewaarde and Reijers (2017) Rosenblat *et al.* (2017) van Doorn (2017)
Regarding terms used	**"*Access-Based Consumption*"**	**"*Gift Economy*"**	**"*Gig Economy*"**	**"*On-Demand Economy*"**	**"*Sharing Economy*"**
	Bardhi and Eckhardt (2012)	Debenedetti *et al.* (2014) Mewburn and Thomson (2013)	Graham *et al.* (2017) Harvey *et al.* (2017)	van Doorn (2017)	Abrahao *et al.* (2017) Cohen and Kietzmann (2014) Ossewaarde and Reijers (2017) Rosenblat *et al.* (2017)
Regarding the title	**Use a term in the title**			**Do not use a term in the title**	
	Bardhi and Eckhardt (2012) Cohen and Kietzmann (2014) Debenedetti *et al.* (2014) Graham *et al.* (2017) van Doorn (2017)			Abrahao *et al.* (2017) Harvey *et al.* (2017) Mewburn and Thomson (2013) Ossewaarde and Reijers (2017) Rosenblat *et al.* (2017)	

Source: Author's source

Regarding the market on which the article focuses on, in this group, only two markets are studies: labour market and the transportation market, with the last on being the market with the most articles with four, one more than the labour market (Table 20).

Table 19-Market analysis of the second quadrant

	Article	Market segment	Platform
Market centred articles	Abrahao *et al.* (2017)	Transportation market (carsharing)	Uber
	Bardhi and Eckhardt (2012)	Transportation market (carsharing)	Zipcar
	Cohen and Kietzmann (2014)	Transportation market (carsharing)	Non-applicable
	Graham *et al.* (2017)	Labour market	Non-applicable
	Harvey *et al.* (2017)	Labour market (fitness market)	Non-applicable
	Rosenblat *et al.* (2017)	Transportation market (carsharing)	Uber
	van Doorn (2017)	Labour market	Non-applicable

Source: Author's source

6.3. Third quadrant

The third quadrant gathers three types of articles, articles with some social relevance, articles with some academic relevance or some relevance in both fields but gathers less than 38.5 in AAS and less than 13.255 in FWCI. Due to the diversity of this group is more complicated to draw a conclusion about the overall look of the articles with academic relevance or social relevance.

6.4. Fourth quadrant

In group four, the more academic group like the other two groups analyze, "*sharing economy*" is the term most used followed by the term "*collaborative consumption*", "*on-demand economy*" and "*platform economy*". More articles use one related term than multiples. Regarding the title, most of the titles use a term in the title.

Table 20- Term analysis of the fourth quadrant

Regarding the number of terms used (title, keywords and abstract)	**Use multiple terms**		**Use only one term**	
	Belk (2014a) Cheng (2016) Möhlmann (2015) Schor (2017)		Belk (2014b) Dubal (2017) Hamari (2013) Schor *et al.* (2016) Wang and Nicolau (2017) Zervas *et al.* (2017)	
Regarding terms used	**"*Collaborative Consumption*"**	**"*On-Demand Economy*"**	**"*Platform Economy*"**	**"*Sharing Economy*"**
	Belk (2014a) Belk (2014b) Cheng (2016) Hamari (2013) Möhlmann (2015)	Dubal (2017)	Schor (2017)	Belk, 2014a) Cheng (2016) Möhlmann (2015) Schor (2017) Schor *et al.* (2016) Wang and Nicolau (2017) Zervas *et al.* (2017)
Regarding the title	**Use a term in the title**		**Do not use a term in the title**	
	Belk (2014a) Cheng (2016) Möhlmann (2015) Schor (2017) Schor *et al.* (2016) Wang and Nicolau (2017) Zervas *et al.*, (2017)		Belk (2014b) Dubal (2017) Hamari (2013)	

Source: Author's source

Regarding the markets analysed in this group, this group is the most eclectic, transportation market, labour market, food exchange, knowledge, services and social capital exchange, markers, peer-to-peer trading and the market with the highest number of articles, accommodation market.

Table 21-Market analysis of the fourth quadrant

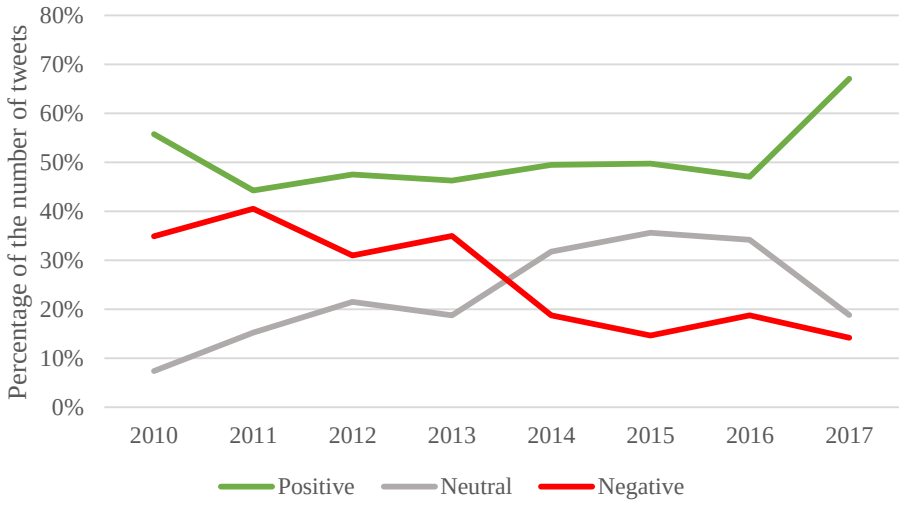
	Article	Market segment	Platform
Market centred articles	Dubal (2017)	Labour market (general)	Non-applicable
	Hamari (2013)	Peer-to-peer trading	Sharetribe
	Möhlmann (2015)	Accommodation Transporting (carsharing)	Airbnb Car2Go
	Schor (2017)	Accommodation Transporting (carsharing) Labour market (short term)	Airbnb RelayRides TaskRabbit
	Schor *et al.* (2016)	Labour market (reciprocity base short term) Food exchange Makerspace Knowledge, services and social capital exchange	Time Bank Food Swap Craftworks Winterpreneur
	Wang and Nicolau (2017)	Accommodation	Airbnb
	Zervas *et al.* (2017)	Accommodation	Airbnb

Source: Author's source

7. Airbnb sentiment analysis

Regarding the evolution of the sentiment of Airbnb in Twitter there are two key moments, as seen in Figure 11: from 2010 to 2013 and from 2014 to 2017. During the entire period, the positive sentiment is the dominant sentiment regarding the company, however, between 2010 and 2013 the negative sentiment overpassed the neutral sentiment, and between 2014 to 2017 the opposite occurs. 2011 was the year with the highest percentage of negative sentiment with 40.51% and 2017 the year with the highest percentage of positive sentiment with 67.02%.

Figure 11- Sentiment analysis of Airbnb in Twitter



Source: Author's source using Crimson Hexagon (2018) database

7.1. Year 2011

2011 was a particular negative year for Airbnb. As seen in Figure 12 two stories were at the base of this negative sentiment, firstly what is called "Airbnb Nightmare" and, secondly, the Illegal Hotels and New York. The "Airbnb Nightmare" was a result of two stories that were widely spread in social media platforms such as Twitter. The story began with a post on his blog of a user known as EJ. The post called "Violated: A traveller's lost faith, a difficult lesson learned" told his bad experience while renting his house in New York City (EJ, 2011). Personal items and information stolen, property destruction were some of the crimes happen in this story (EJ, 2011). This story was the first known story of this type of crimes involving the users of Airbnb. The track record of Airbnb was practically flawless. The "*accolades in the media and great reviews*" (EJ, 2011: 2) was seen as a more secure option comparing to the competition at the time, like Craigslist, which justified a larger fee of Airbnb (EJ, 2011). This situation showed some fragility in response by Airbnb as the urgent line, according to EJ was not enough (EJ, 2011). This post was published on June 29^{th,} 2011(EJ, 2011). Almost one month later, TechCrunch picks up a story from Troy Dayton from April (Arrington, 2011). The story also involves the destruction of robbery of property and even meth pipes left behind (Arrington, 2011). The official press release commenting on the cases was release on Uber's blog and the tweet which shares this blog link become the title of the news in some newspaper: "*We screwed up, and we're sorry. Here's how we're making it right*" released in August 1st,

which confirmed the creation of a $50,000 for similar situations (Kolawole, 2011; Parr, 2011). The other story evolved the New York's law for short-term renting, which were named by the state of New York as Illegal Hotels (Jeffries, 2011; Rueb, 2011). The law focus on the rental of residential rooms for less than 30 days (Jeffries, 2011; Rueb, 2011b). Brian Chesky contested the approval of the law due to characterising Airbnb's landlords as "*slumlords*" (Rueb, 2011:1) and the impact of the law will affect negatively "*thousands of families, young professionals and elderly people*" (Rueb, 2011:1).

Figure 12- Topic wheel for negative tweets regarding Airbnb in 2009

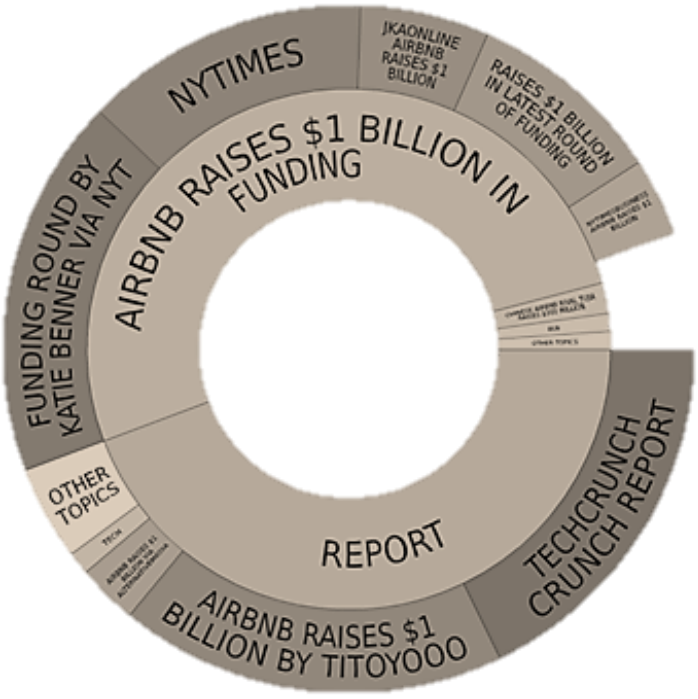
Source: Crimson Hexagon (2018)

7.2. Year 2017

The 2017 year was the most positive year of Airbnb and was a result of three different stories, according to Figure 13. One was discovered as the result of the topic well for the positive tweets of 2017 and the other two by the two tweets with the most retweets in this period. Starting with the topic well, the one billion funding in that year. In 2007, raised a one billion dollar in funding, reaching an evaluation of 31 billion dollars (Benner, 2017; Thomas, 2017). Over less than a decade, Airbnb raised over three billion dollars and a billion dollar in a credit line (Benner, 2017).

The other two stories are related to one another. Firstly, in the 29th of January, Airbnb Co-founder Brian Chesky tweeted the following: "*Airbnb is providing free housing to refugees and anyone not allowed in the US. Stayed tuned for more, contact me if urgent need for housing*". This tweet gathered 100,000 tweets. This follows Donald Trump's travel ban. This tweet is one of the three tweets released by Chesky on the topic: "*Not allowing countries or refugees into America is not right, and we must stand with those who are affected*" and "*Open doors brings all of US together. Closing doors further divide the US. Let's all find ways to connect people not separate them.*" (Fenton, 2017: 2). This situation led to the creation of the campaign #weaccept. In February 5th 2017, the official account of Airbnb in Twitter released the second highest tweet regarding retweets, with 28,000 retweets: "*Acceptance starts with all of us. #weaccept*" also sharing the official video of the #weaccept campaign. The campaign release in the same day had two goals: to provide to 100,000 people in need with short-term housing and contribute with 4 million dollars over four years for the International Rescue Committee (Chesky *et al.*, 2017).

Figure 13- Topic wheel for positive tweets regarding Airbnb in 2017



Source: Crimson Hexagon (2018)

9. Conclusion

This dissertation aimed to report what have been the SE in two fields, academic and social field. SE is a business model of sharing with a network of peers (Schor and Fitzmaurice, 2015; Qing Zhu and Lee, 2016). Due to the multiple definition, narrow or restrict, SE became not only an umbrella construction (Acquier *et al.*, 2017). This umbrella construction led to the creation of multiple definitions, some for a specific part, others a broader approach. Those studied in this dissertation are "*access-based consumption*", "*access economy*", "*collaborative consumption*", "*gift economy*", "*gig economy*", "*on-demand economy*", "*peer economy*" and "*rental economy*".

In the social side, Twitter was used as the base of information. Two approaches were used in the Twitter side, a quantitative and qualitative. In the quantitative side we discover that through the years the number of tweets has been increased and the Rideshare Justice Project was the user that contribute the most to the total of the number of tweets. The SE have been a topic of importance for multiple influential users with 20 Twitter accounts with over 99 in Klout Score. About the terms in Twitter, we identified three different periods, the first where "*collaborative consumption*" was the dominant term until 2013, a second when "*sharing economy*" was the dominant term and finally, 2017 when "*gig economy*" was the most mention term on Twitter. Using unspecified event detection technique, we identified six relevant events on Twitter with the following criteria, number of tweets per day, number of retweets and the first tweet. Two events focus on the application of this business models to new markets, two focusses on the impacts of SE in marketing and the job market, one in a gift economy in Mali and the last one is a backlash regarding an adverting campaign.

On the academic side, the story of the SE started in late 70s with the Felson and Spaeth (1978) and continued to increase, more significant from 2011 following the tendency of the citations of Botsman and Rogers (2010a) and also Sundararajan (2016). Karen Xie was the author with the most number of articles until 2017 while Doug Guthrie and Russel Belk the most cited authors. On the academic field, only two terms were dominated in comparison to the others, in a first period gift economy and the second Sharing Economy. While gift economy offers a more robust term with less articles presented on of the other terms when used it, the opposite happens to collaborative consumption. In the list of most cited articles, the majority used only one term with collaborative consumption and gift economy having the dominance.

The differences between the two fields are the answer to the main research question. Regarding the terms, "*gift economy*" had a more academic application while "*gig economy*" a more social application. This highlights the importance of the labour market in the social side in comparison to the importance of communities in the academic side. Regarding the markets while academic side focus the studies on consolidated markets in the SE such as accommodation or transportation, the social media prefer to focus on new applications of the model, with a focus on the innovation.

In the altmetric academic comparison, the major result while the social relevant articles do not follow a pattern regarding the term while the markets that are focus are labour and transportation market were the more relevant. The academic relevant articles have followed a more defined pattern. Most of them use a term on the title while Sharing Economy and collaborative consumptions are the most used terms. The accommodation market gathers the largest number of articles. Therefore, we can conclude that in articles the accommodation market has a more preponderant aspects.

This dissertation suggests the importance of the SE to academics, media and population in general. While the topics, the language and the analysis made are different, signals of convergence exist. Altmetrics suggests that academic content have could lead to social media impact, while social media analysis, as a research methodology, could lead to academic impact as well. The differences between both fields, nonetheless, evidence a gap between theory and practice, the speed of both fields and the quality of the content. Social media reflects with the present while bibliometrics look to the past and future. For this reason, a combined look at social media and bibliometrics, with special attention to the differences give an overall broader look to the subject of study. In the case of public decision-makers, social media could identify the immediate needs and problems while bibliometrics helps to find the answers and the structural issues. In the case of the SE, for example, social media was a driver of communication of the regulation problems of Airbnb and Uber, while bibliometrics served as the argument for the different positions.

The results of this analysis have to be analysed with precaution, due to some of the problems of databases used and the mythology used. The first aspect to be addressed is the static nature of the altmetric analysis. As a result of the AAS and the FWCI, the results of the benchmark quadrant analysis is determined by the period from where the results were extracted. Therefore, if the study were made in a different period the results could be different. Also, regarding the sentiment analysis some tweets that should be considered

negative such as: "*A woman was pushed down the stairs by her Airbnb host. https://t.co/fUDyv0YIMZ*" were considered positive and gathered 13,000 retweets.

Regarding future investigation, studying terms such as collaborative economy or even Uber economy could bring some new perspective to this analysis as well a sentiment analysis to Uber. Also mention the usage of the benchmark analysis as a new way to study giving new results to previous bibliometrics study fields.

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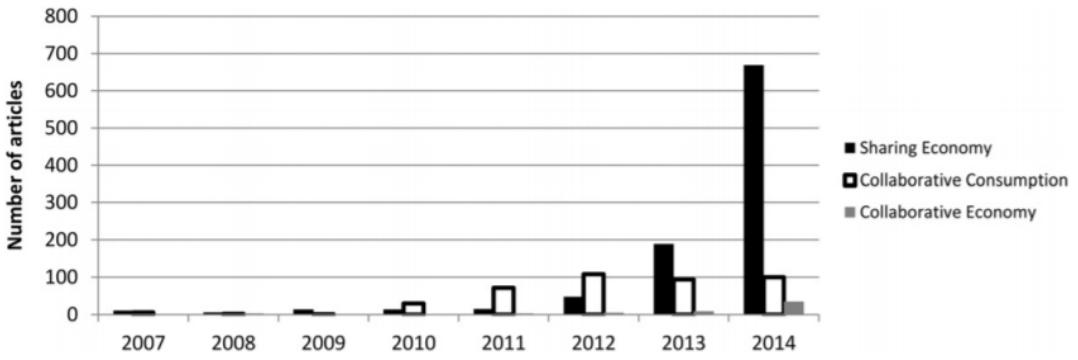
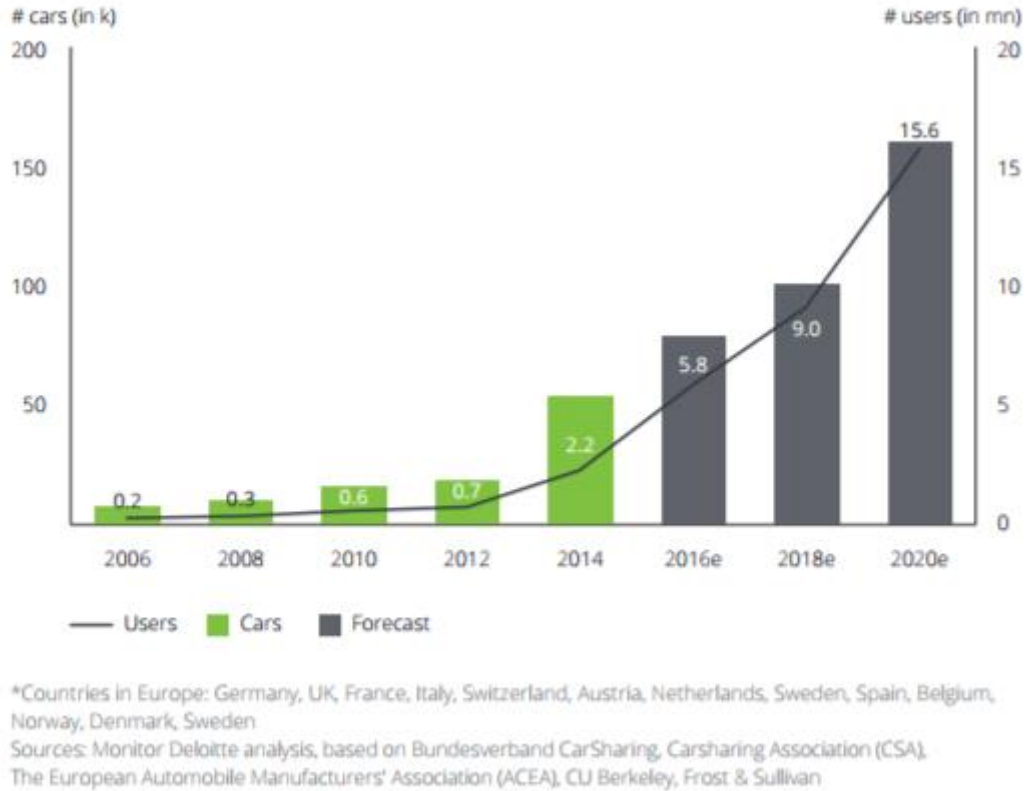
Appendixes

Appendix 1- Number of newspaper articles referring to the 'Sharing Economy', 'Collaborative Consumption' and the 'Collaborative Economy' by year



Source: Martin (2016) made with LexisNexis database

Appendix 2- European car sharing market from 2006 to 2020 (prevision)



Source: Pottebaum *et al.* (2017)

Appendix 3- Characterization about Twitter base research between 2007-2012 by disciplines

Discipline	Number of Studies
Computer science	145
Information science	82
Communication	52
Business	15
Economics	15
Medicine	14
Education	13
Political science	13
Sociology	9
English	6
Geography information systems	6
Mathematics	3
Psychology	3
Law	2
Physics	2
Environmental Sciences	1
Sports science	1

Source: Zimmer and Proferes (2014)

Appendix 4-Characterization about Twitter base research between 2007-2012 by method of analysis

Method	Number of Studies
Content analysis	234
Traffic/propagation/network analysis	80
Sentiment	63
User study	60
Predictive/correlation	51
Event detection	26
Influence study	15
GIS analysis	8
Other	8

Source: Zimmer and Proferes (2014)

Appendix 5-Characterization about Twitter base research between 2007-2012 by number of tweets analyzed

Number of tweets analysed	Number of cases
1-10	1
10-100	2
100-1,000	29
1,000-10,000	62
10,000-100,000	48
100,000-1,000,000	39
1,000,000-10,000,000	62
10,000,000-100,000,000	42
100,000,000-1,000,000,000	17
1,000,000,000-10,000,000,000	8

Source**:** Zimmer and Proferes (2014)

Appendix 6- Comparison between bibliometric studies of sharing economy

Study	Cheng (2016)	Oh and Moon (2016)	Jerónimo (2017)	Dillahunt *et al.* (2017)	Tomás (2018)
Bibliometric database used	EBSCOHost Science Direct Google Scholar	Non-specified	Scopus Web of Science	ACM Digital Library	Scopus
Search query	Titles, abstracts and keywords "*sharing economy*" or "*collaborative economy/consumption*"	Articles which cited or: Lessig (2008) or Benkler (2002) or Sundararajan (2016) or Gansky (2010) or Botsman and Rogers (2010)	"*sharing economy*" as a keyword on Scopus "*sharing economy*" as a topic on Web of Science	Any field "*sharing economy*" or "*collaborative consumption*" or "*peer-to-peer exchange or physical crowdsourcing*" or "*gig economy*" Authors keywords "*sharing economy*", "*collaborative consumption", "peer-to-peer exchange", "physical crowdsourcing", "gig economy", "algorithmic management", "collaborative economy", "local online exchange", "mobile crowdsourcing", "network hospitality", "on-the-go crowdsourcing", "platform economy", "ridesharing", "social exchange", "surge pricing", "timebanking", "micro tasking", "microtasking", "situated crowdsourcing", "workplace studies", and "spatial crowdsourcing.*"	Titles, abstracts and keywords "*sharing economy*" or "*collaborative consumption*" or "*gig economy*" or "*gift economy*" or "*access-based economy*" or "*access economy*" or "*rental economy*" or "*peer economy*" or "*on-demand economy*"
Period of analysis	2010-2015	2008-2015	2006-2016	2009-2016	1978-2017

Number of articles	162	172	199	354	545
The focus of the study	Comparing general literature regarding sharing economy with sharing economy literature regarding hospitality	Analysis of scientific production per year on sharing economy	Analysing scientific literature regarding sharing economy and its roots literature	Examining investigation in computing of sharing economy	Explaining the evolution of terms related to sharing economy and the impact of sharing economy pertaining research in social media with altmetrics

Source: Author's source

Appendix 7- Important events on Twitter

7.1. First tweet

The first tweet was released on July 12th, 2009 by the twitter user @carhughes who according to her Twitter page is a digital marketer with 5,066 followers and published more than 14,400 tweets[30]. The tweet was: "*An awesome vid that looks @ the Malian* "*gift economy*" *that fosters human/cultural richness despite severe impoverishment.* http://is.gd/1w9k9" The link opens a 6 minutes and 19 seconds mini-documentary in YouTube produced by Other Words Are Possible and is about the gift-giving society of Mali (Bollider, 2009; KarmaTube, 2009). In Mali, the term used to gift giving is *Dama* and is rooted in its culture and contribute to the survival of inhabitants of Mali from traditional values of humanity and sharing (Bollider, 2009).

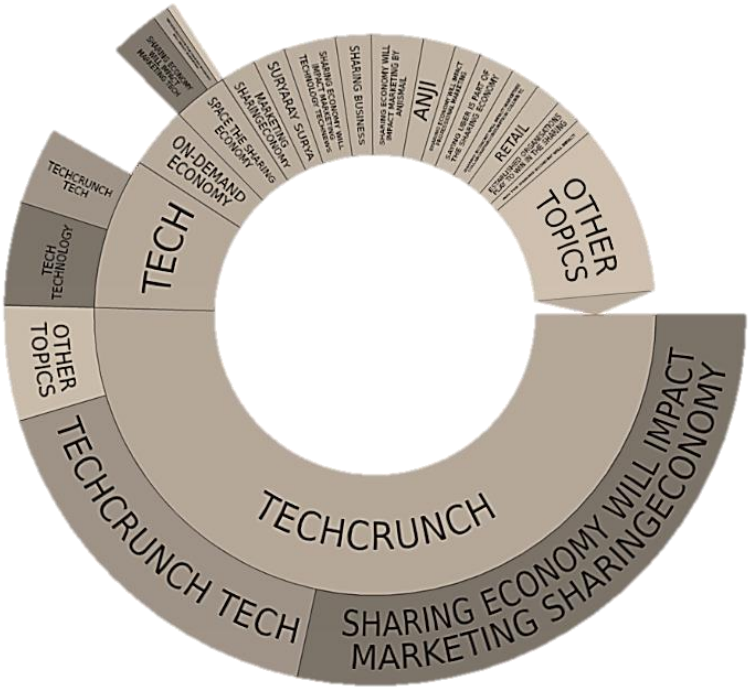
7.2. Days with the most tweets

The two days which had the most number of tweets were January 18th, 2015 and July 11th, 2017. The average number of tweets released per day was 615 tweets.

On January 18th, 2015 it was gathered 6,609 tweets regarding sharing economy. To analyse what led to large number, it will be analysed the topic wheel[31] of that day. As represented by Appendix 7.2.1, TechCrunch and the impact of sharing economy had particular attention on Twitter. The reason was a tweet from TechCrunch: "*How the sharing economy will impact marketing* https://goo.gl/9WikR4".The tweet regards an article in the TechCrunch website from Anji Ismail from the day before that references the differences for marketing which sharing economy models brought. The most prominent points of the article are the possibility of marketing campaigns become more efficient, more affordable, with a larger scale and control, also due to the potential of crowdsourcing more creative campaigns (Ismail, 2015). The tweet gathered 83 retweets, 47 likes and 5 direct responses[32].

[30] Data from February 19th, 2018 according to Twitter (2018).
[31] An aggregation of subtopics inside the topic of search and clusters, a visual representation of connections between words used in tweets (Crimson Hexagon, 2018).
[32] Until February 2th, 2018.

7.2.1. Topic wheel of January 18th 2015



Source: Crimson Hexagon (2018)

On July 11th, 2017 were recorded 10,354 tweets about the topic sharing economy. For analysing the reason behind this number of tweets besides the topic wheel analysis as the previous event, since 2017, Crimson Hexagon started gathering link shared on Twitter and respective host site. By combining this link gathering and information of the most tweets retweeted there is enough information to justify a large part of the 10,354 tweets of this day. Therefore, one of the reasons for these unusual number of tweets comes as a response to the Matthew Taylor, *Good work: The Taylor review modern working practices*. The report presents data for the state of employment and employees in the United Kingdom. The report displays the reality of some of the gig economy workers as well as some policy recommendations (Taylor *et al.*, 2017).

As an answer to this report two news from The Guardian from July 11th, 2017 had repercussions on Twitter. Firstly, the article "*The Taylor review could make thing worse for workers. What a surprise*", gathered most retweets from a single tween when the author, Owen Jones tweeted in July 11th, 2017: "*The Tories are the political wing of bosses - and the #TaylorReview fails Britain's workers. My piece: https://t.co/ivVig0QUc0* https://t.co/LFsHII2Vj0", in that day, this tweet was retweeted 260

times (Appendix 7.2.2). The article defends the tone of the report and organisation behind the report, the British political party the Tories, as a defender of the employers instead of the employees when defending "workers" as "dependent contractors" enforcing problems of gig economy worker who are denied essential rights (Jones, 2017).

However, the article from Owen Jones was not the most shared link on July 11th, 2017, that achievement was from another The Guardian news on the same day by Rowena Mason, "*May says she will help gig economy workers but fails to pledge new laws*". This link was shared on Twitter 394 times, more 75 than the second link (the Owen's Jones article) (Appendix 7.2.3). The news regards the response to Matthew Taylor report by United Kingdom's Prime Minister, Theresa May (Mason, 2017). The article reports that Theresa May will study Taylor's recommendation, however, not all the ideas will be implemented. Both news proves the importance of the release of *Good work: The Taylor review modern working practices* in Twitter itself and that the conditions of gig economy workers are a crucial topic for this social media.

7.2.2. Top retweets of July 7th, 2017

Retweet	Occurrences	Original Author
"*The Tories are the political wing of bosses - and the #TaylorReview fails Britain's workers. My piece: https://t.co/ivVig0QUc0 https://t.co/LFsHII2Vj0*"	260	@OwenJones84 (Owen Jones)
"*RT @SkyNews* "*Bogus self-employment has to be dealt with*" *- Labour leader Jeremy Corbyn criticises zero-hours contracts used in the gig economy https://t.co/l2dmxvUViS*"	210	@SkyNews (Sky News)
"*Many gig economy bosses will be breathing a sigh of relief this morning. Looks like #TaylorReview lets them off hook https://t.co/LsHOwxY2gk*"	180	@FrancesOGrady (Frances O'Grady)
"*Rebecca Long-Bailey: Gig economy employees* "*are being exploited*" *(ahead of PM's pledge to help protect such workers) https://t.co/a5vjFUjfmH*"	170	@Corbynator2 (C0RBYNAT0R)
"*I want to see all London's workers paid at least the London Living Wage. That must include everyone in the gig economy. #TaylorReview*"	140	@SadiqKhan (Sadiq Khan)
"*Using Uber is not 'morally acceptable', says Labour's business spokeswoman Rebecca Long-Bailey - Politics live https://t.co/OsZpAF2PbB*"	120	@guardian (The Guardian)
"*It looks like the #TaylorReview isn't the game-changer that unions want and that gig economy workers need https://t.co/T3l6QZvxau*"	100	@The_TUC (TradesUnionCongress)

"*The Taylor review could make things worse for workers. What a surprise | Owen Jones https://t.co/70kQOlnltG*"	90	@guardian (The Guardian)
"*Using Uber is not 'morally acceptable', says Labour's business spokeswoman Rebecca Long-Bailey - Politics live https://t.co/BLjIbMnGym*"	90	@guardian (The Guardian)
"*The Sharing Economy meets its match—the umbrella https://t.co/jqa4xGfDmy*"	70	@erickschonfeld (Erick Schonfeld)

Source: Author's source using Crimson Hexagon (2018) database

7.2.3. Top links of July 7th, 2017

Title of the link	Occurrences	Author
May says she will help gig economy workers but fails to pledge new laws	394	The Guardian
The Taylor review could make things worse for workers. What a surprise	319	The Guardian
The Taylor Review isn't the 'game-changer' that gig economy workers need	315	Touch Stone
Theresa May admits her flagship gig economy report could end up 'gathering dust' as PM bungles relaunch	191	Independent
Biggest 'reset' for workers in a generation proposed in Taylor review	142	Sky News
Eyeing sleepy office workers, China's 'sharing economy' opens nap capsules	136	Reuters
May relaunches premiership with new protections for gig economy workers	135	The Guardian
Who's working in the 'gig economy'?	119	Full Fact
Regulating the gig economy will hurt workers and consumers	105	CAPX
National Insurance tax hit for gig economy firms	96	BBC News

Source: Author's source using Crimson Hexagon (2018) database[33]

7.3. Tweets with most retweets analysis

The retweet is one of the most critical factors when analysing a topic on Twitter. The number of retweets of a tweet is a proxy of the spread of a piece of news in Twitter (Zaman *et al.*, 2010). Due to the importance of this feature, some studies try to use retweets as a prediction model. Models such as retweet rate analysis from Suh *et al.*

[33] Only counting links available as of February 20th, 2017

(2010) or the behaviour analysis from Yang *et al.*, (2010). Boyd *et al.* (2010) presented the reason for retweeting which are: spreading tweets to new audiences, to entertain or informed, to comment a specific tweet, to show as an active listener to agree with tweet, as an act of friendship, to recognise a less influential user, to gain followers and visibility or to access the content in the future more easily. To understand this spread of information, this section will extensively analyse the top 3 retweets between May 23rd, 2008 and December 31st, 2017 (Appendix 8.3.1).

In January 18th, 2016, Viral Buzz News with the Twitter handler @ViralBuzzNewss[34] released the third highest tweet relating to sharing economy of the database: "*More Money For India's On-Demand Economy: Swiggy Raises $35M For Food Delivery... - https://t.co/u94ofDynGe https://t.co/A46nMf3Z1T*" which gathered 2,900 retweets. Swiggy is an Indian on-demand food delivering system competitor to similar systems such as Zomato Order, FoodPanda and TinyOwl in India (Bhotvawala *et al.*, 2016). The tweet shares news regarding cash injection of the expansion of their business in India (Lunden, 2016).

The second highest tweet, concerning retweet regarding the topic of study, is from All Science Globe with the Twitter handler @AllScienceGlobe[35]: "*The sharing economy comes into the commercial kitchen - https://t.co/j189qUqiMC https://t.co/LfpvtxByng*" which gathered 3,500 retweets. The link to the original tweet is from an article of TreeHugger about a project from Christine Manning of a commercial kitchen which could be rent when is needed (Alter, 2014). The news is about the project reaching funding on the crowdfunding platform Kickstart (Alter, 2014).

The tweet with the most retweet is concerning negative backlash against the company Fiverr. Fiverr is a type "*micro-task marketplace where users can buy and sell services, which are called gigs*"(Lee *et al.*, 2015: 3). Therefore, Fiverr is a form of gig economy. In March of 2017, it released a campaign which on March 9th of the same year had the most retweets of a single tweet regarding sharing economy border topic. The tweet released by the Twitter handler @b_cavello was: "*The* "*gig economy*" *is killing us. Most depressing ad of the day goes to @fiverr*", which follows by picture in Appendix 8.3.2 above gathered 6,700 on that day.

[34] On the day of verification, 20th January 2018, this Twitter handler has been suspended
[35] On the day of verification, 20th January 2018, this Twitter handler has been suspended

This tweet was featured in an article from Metro News website on March 10th 2017 (Scott, 2017). The backlash comes from the slogan presented in the image and the internal idea of working so much that activities such as sleep, eating and self-care are superseded (Scott, 2017).

7.3.1. Top retweets regarding sharing economy from 2008-2017

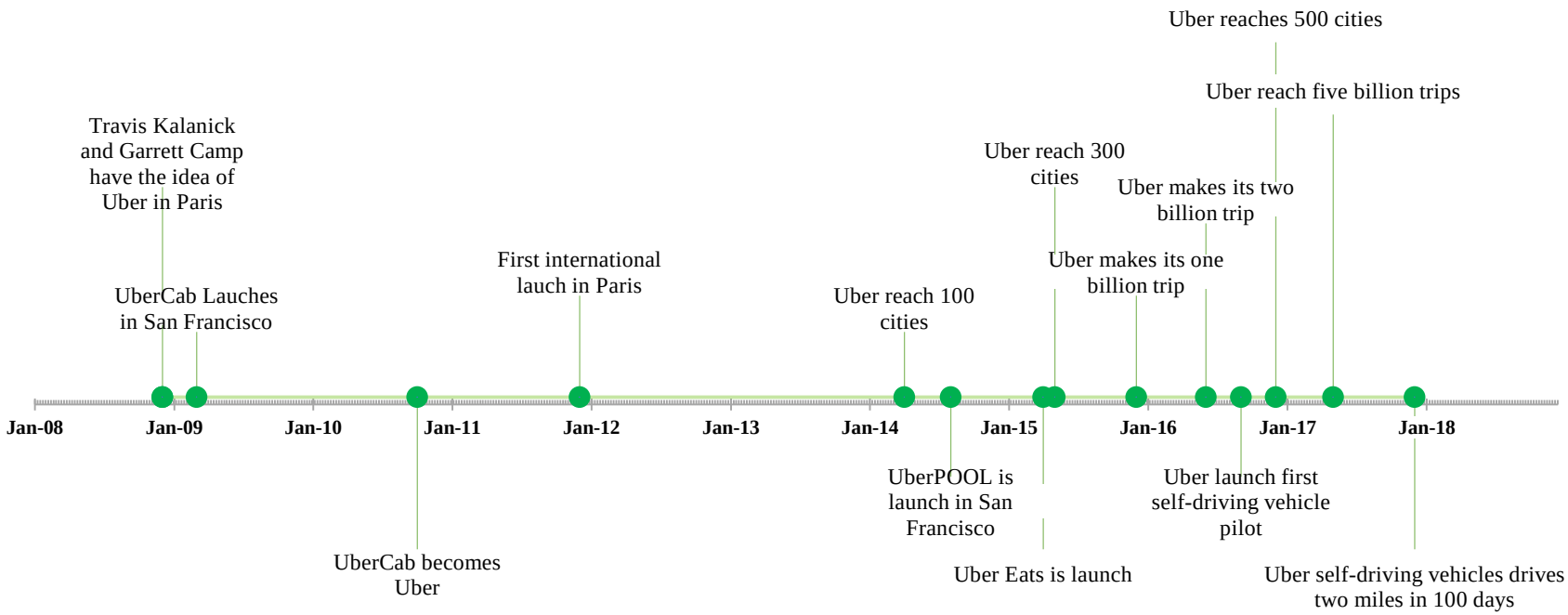
Retweet	Occurrences	Original Author
The "gig economy" is literally killing us. Most depressing ad of the day goes to: @fiverr https://t.co/xq0sxsL55t	6,700	@b_cavello (it's B! Cavello 🐝)
The sharing economy comes into the commercial kitchen - https://t.co/j189qUqiMC https://t.co/LfpvtxByng	3,500	@AllScienceGlobe (All Science Globe)
More Money For India's On-Demand Economy: Swiggy Raises $35M For Food Delivery... - https://t.co/u94ofDynGe https://t.co/A46nMf3Z1T	2,900	@VIralBuzzNews (Viral Buzz News)
Many professionals have said goodbye to the traditional 9-5 job. https://t.co/mpH8Ag7hpO	2,000	@juanblanco76 (John White)
I wrote about an extremely gross trend in corporate messaging https://t.co/BOMT8MGZYa	1,900	@jiatolentino (Jia Tolentino)
2 billion adults have no bank account in 2017. These are the so called unbanked. @blocklancer helps integrating the unbanked in the gig economy! Many from the unbanked are coming from India, Indonesia and Africa. #Ethereum #Blocklancer #Unbanked #Gig #Cryptocurrency https://t.co/v6yRaZ4CVW	1,700	@blocklancer (Blocklancer)
Freelancers are on the rise and are projected to make up 43% of the US workforce by 2020. @juanblanco76 https://t.co/mpH8AgoSOo via @Inc	1,600	@juanblanco76 (John White)
America shouldn't take advice on the sharing economy from someone who has been driven around in a limo for 30 years.	1,600	@RandPaul (Senator Rand Paul)
Merry Christmas! We are exciting to announce our partnership with Obike. Obike is one of the largest sharing economy companies active in 20 countries across Europe, Asia and Australia with 10 million users. Obike will launch sharing bike application and Ocoin based on #TRON #trx https://t.co/dG60lo7iZb	1,300	@justinsuntron (Justin Sun)
The sharing economy: Using business as a force for good http://t.co/bjDlwtZ3ZJ http://t.co/RWhrlOJyq3	1,300	@richardbranson (Richard Branson)

Source: Crimson Hexagon (2018) database

7.3.2 Picture from the tweet of @b_cavellho

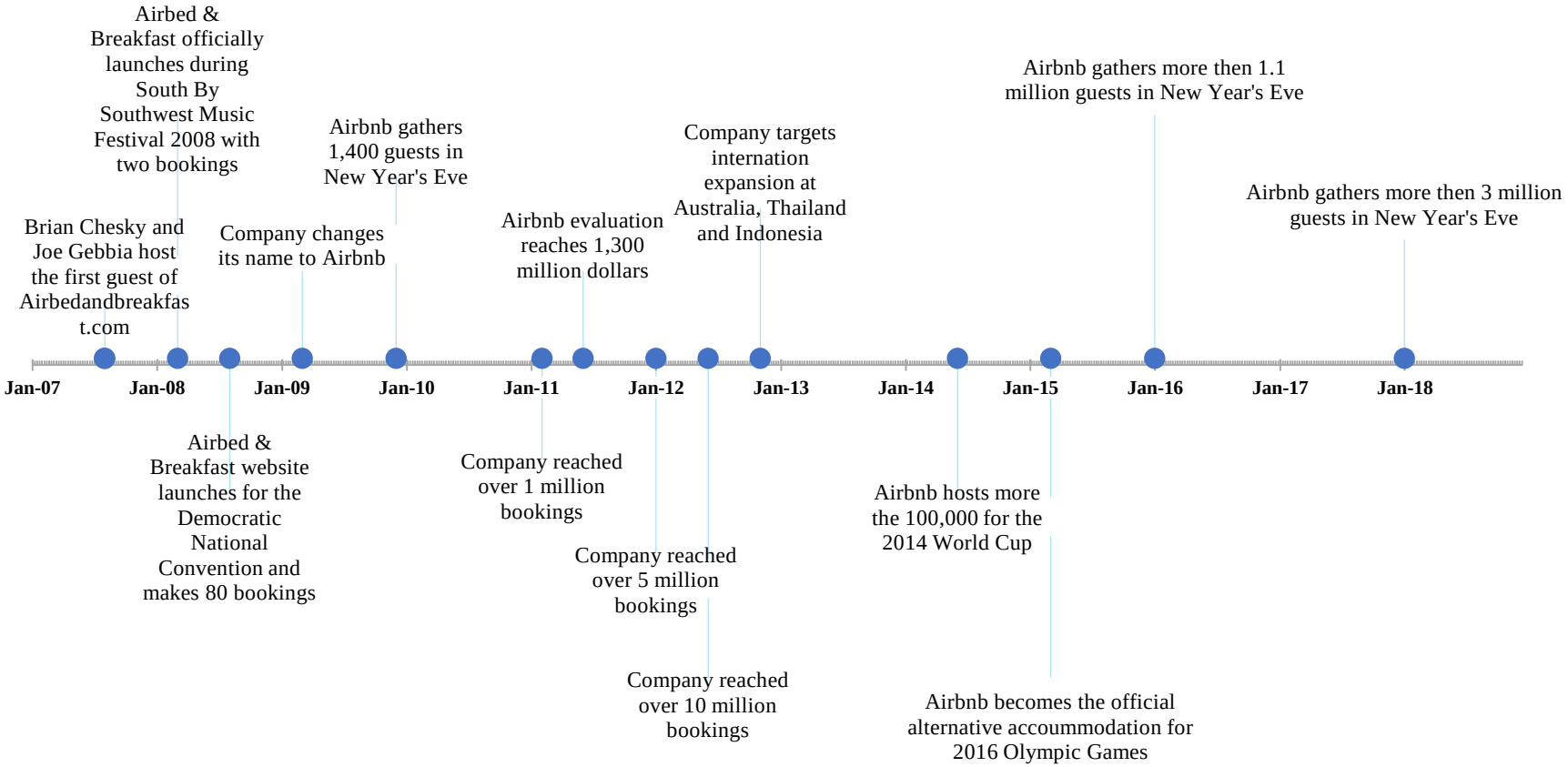
Source: Twitter (2018)

Appendix 8- Uber timeline



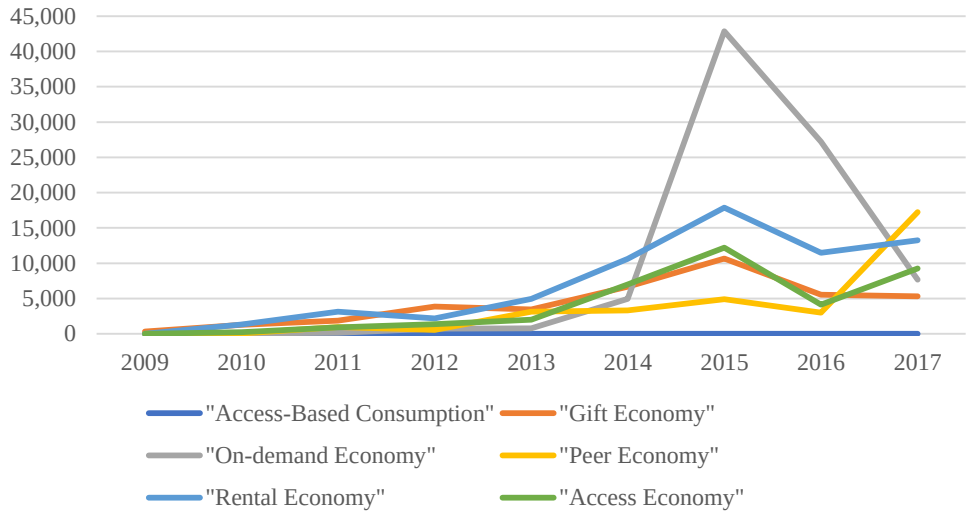
Source: Uber (2018)

Appendix 9- Airbnb timeline



Source: Authors source with information from Airbnb (2018), Clifford (2018) and Learn Airbnb (2017)

Appendix 10- Evolution of terms regarding sharing economy on Twitter (excluding sharing economy, collaborative consumption and gig economy)



Source: Author's source using Elsevier B.V. (2018a) database

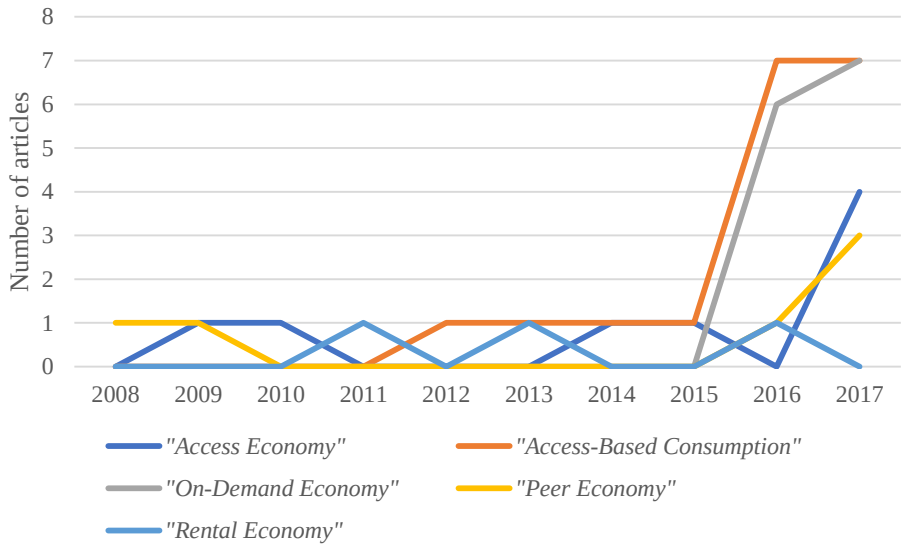
Appendix 11- Top 20 areas of journals of the Scopus's sharing economy database per number of articles

Areas	Number of articles
Business and International Management	59
Geography, Planning and Development	58
Sociology and Political Science	56
Strategy and Management	54
Economics and Econometrics	46
Marketing	45
Tourism, Leisure and Hospitality Management	33
Law	29
Renewable Energy, Sustainability and the Environment	29
Environmental Science (miscellaneous)	26
Management of Technology and Innovation	26
Social Sciences (miscellaneous)	25
Applied Psychology	23
Business, Management and Accounting (miscellaneous)	23
Cultural Studies	23
Comunication	21
Computer Networks and Communications	21
Development	21

Economics, Econometrics and Finance (miscellaneous)	21
Human-Computer Interaction	21

Source: Authors source with information from Scimago Lab (2018)

Appendix 12- Evolution of terms regarding sharing economy on bibliometrics (excluding sharing economy, collaborative consumption, gig economy, and gift economy)



Source: Author's source using Elsevier B.V. (2018a) database

Appendix 13- Top 10 articles per number of citations discarding self-citations

Article	Number of citations (discarding self-citations)
Guthrie (1998)	322
Bergquist and Ljungberg (2001)	240
Belk (2014a)	263
Bardhi and Eckhardt (2012)	203
Hamari (2013)	149
Zeitlyn (2003)	144
Yang (1989)	123
Hamari et al. (2016)	84
Albinsson and Perera (2012)	68
Barbrook (1998)	64

Source: Author's source using Elsevier B.V. (2018a) database

Appendix 14- Scores per type in the Altmetric Attention Score

Type of source	Weighted score
News	8
Blogs	5
Wikipedia	3
Policy Documents (per source)	3
Patents	3
Twitter	1
Sina Weibo	1
F1000/Publons/Pubpeer	1
Open Syllabus	1
Google+	1
LinkedIn	0.5
Facebook	0.25
Q&A	0.25
YouTube	0.25
Reddit/Pinterest	0.25

Source: Altmetric (2018a)

Appendix 15- Articles used in the benchmark analysis

Article	AAS	FWCI	Quadrant
Edelman *et al.* (2017)	60	83.35	*First*
Martin (2016)	75	27.95	*First*
Hamari *et al.* (2016)	49	46.84	*First*
Ert *et al.* (2016)	39	29.67	*First*
Frenken and Schor (2017)	45	18.88	*First*
Mewburn and Thomson (2013)	320	7.33	*Second*
Graham *et al.* (2017)	198	8.96	*Second*
Ossewaarde and Reijers (2017)	82	0	*Second*
Abrahao *et al.* (2017)	67	1.35	*Second*
Rosenblat *et al.* (2017)	50	1.78	*Second*
Debenedetti *et al.* (2014)	45	5.95	*Second*
van Doorn (2017)	44	8.46	*Second*

Bardhi and Eckhardt (2012)	40	11.58	*Second*
Harvey *et al.* (2017)	40	2.28	*Second*
Cohen and Kietzmann (2014)	39	12.07	*Second*
Dredge and Gyimóthy (2015)	34	8.97	*Third*
Fleming (2017)	38	1.95	*Third*
Parigi *et al.* (2017)	35	3.56	*Third*
John (2013)	28	9.03	*Third*
Tussyadiah and Pesonen (2016)	27	9.26	*Third*
Martin *et al.* (2015)	27	6.55	*Third*
Fabo *et al.* (2017)	30	2.34	*Third*
Gutiérrez *et al.* (2017)	24	5.9	*Third*
Nafus (2012)	26	2.88	*Third*
Richardson (2015)	16	12.67	*Third*
Albinsson *et al.* (2012)	22	3.59	*Third*
Watkins *et al.* (2016)	18	3.73	*Third*
Berg (2016)	20	1.1	*Third*
Scaraboto (2015)	7	11.77	*Third*
Bardhi and Eckhardt (2017)	18	0	*Third*
Davies *et al.* (2017)	17	0	*Third*
Habibi *et al.* (2017)	3	12.65	*Third*
Fang *et al.* (2016)	4	9.7	*Third*
Barnes and Mattsson (2016)	3	10.53	*Third*
Guthrie (1998)	0	13.19	*Third*
Hamalainen and Karjalainen (2017)	2	10.11	*Third*
Heo (2016)	0	11.23	*Third*
Guttentag and Smith (2017)	0	10.94	*Third*
Liang *et al.* (2017)	0	10.73	*Third*
Masoud and Jayakrishnan (2017)	1	9.67	*Third*
Mariotti *et al.* (2017)	0	10.28	*Third*
Calo and Rosenblat (2017)	0	9.69	*Third*
Schor *et al.* (2016)	4	68.47	*Forth*
Zervas *et al.* (2017)	17	33.13	*Forth*
Belk (2014a)	28	30.67	*Forth*
Belk (2014b)	2	18.11	*Forth*
Möhlmann (2015)	5	16.30	*Forth*
Cheng (2016)	4	15.81	*Forth*

Hamari (2013)	10	15.45	*Forth*
Wang and Nicolau (2017)	0	14.90	*Forth*
Schor (2017)	13	14.60	*Forth*
Dubal (2017)	0	13.32	*Forth*

Source: Author's source using Elsevier B.V. (2018a) and Altmetric (2018a) database