

Louvain School of Management

Impact of the Blockchain on the Sharing Economy: Study from the Perspective of Trust

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A. Introduction

Peer-to-peer sharing applications are an important part of our daily lives. More and more individuals choose to get around using Uber, rent accommodations on AirBnb and buy goods on eBay. Behind this growing significance, scholars have identified the notion of trust as an important driver to influence the consumers' intentions to participate to the peer-to-peer economy.

In light of this, Blockchain has been seen as an important step toward fostering the appeal of peer-to-peer sharing platforms. The technology is said to enable the exchange of value on decentralized digital networks. According to its supporters, these networks are *trust-less* because the need for its participants to *trust* one another is significantly reduced. However, this claim is yet to be substantiated by evidence in research and carried out in applications in business.

In line with the observation of this gap of knowledge, this paper aims to contribute to the understanding of the impact of the Blockchain on the popularity and success of peer-to-peer sharing platforms. More specifically, we strive to assess the current attitudes of people toward using a blockchain sharing platform and understand how the notion of *trust* influences these attitudes. To that end, we lay out our main question of research:

RQ: What is the role of trust in the impact of the Blockchain technology on the popularity of peer-to-peer sharing platforms?

In order to properly answer this question, we break down our research into three more approachable sub questions:

RQ a.: What is the general attitude of individuals regarding the use of blockchain sharing platforms?

RQ b.: What is the influence of trust on the general attitude of individuals regarding the use of blockchain sharing platforms?

RQ c.: What is the individuals' mental representation of trust within a blockchain sharing environment?

Our research begins with our reviews of the literature on the Sharing Economy and the peer-to-peer platforms, Trust and the Blockchain technology. Based on the theoretical understanding of these fields, we develop a conceptualization of trust in blockchain peer-to-peer environments that attempts to capture the individuals' mental representation of the concept. Subsequently, this conceptualization is used as a research model to study the influence of trust on people's attitudes and apply to the business model of a fictional, peer-to-peer accommodation-sharing application built on a blockchain. Thereafter, we conduct a survey among 168 participants that assesses their intention to participate to our platform and the degree of trust that they place in its different actors following the typology outlined in our conceptualization.

At the end of this research, we are able to (**RQ a.**) assess the likely adoption of our blockchain platform, (**RQ b.**) measure the influence of the different components of trust on users' intentions to participate, and (**RQ c.**) empirically test the validity of our representation of trust within a blockchain environment.

First, the statistical analysis of the results of our survey allowed us to testify of the general reluctance of our sample to use our blockchain platform, hinting at the unwillingness of the market to adopt Blockchain technology at the moment and also at the inadequacy of our business model. It is possibly an indication of the current atmosphere of distrust toward Blockchain that may hinder the adoption of comparable applications. Secondly, the findings highlight the components of trust that effectively influence users' participation intentions and those that appear irrelevant. Strikingly, the dimensions of the *platform* have been proven to bear positive influence, debunking the claim of a *trust-free* environment and confirming the role of trust as a facilitator to adoption. Finally, the modelization of trust developed in this paper appeared inadequate to fully fit its representation in people's mind. Alterations, in line with the results of this study and additional research, must be made to our model. Eventually, the objective is to refine our understanding of the role of trust and to be able to leverage its mechanics to foster the widespread adoption of blockchain peer-to-peer platforms.

B. Theoretical Background

1. Trust in Online Peer-to-Peer Marketplaces

1.1. The Sharing Economy

“Twenty-five years from now, car sharing will be the norm and car ownership the anomaly.”

Rifkin, 2014.

We begin our study with a literature review of the sharing economy and its importance. The identification of the drivers behind the rise of sharing movement helps us understand the key factors of success of its applications. We finish this section by specifying the object of our research – i.e., online peer-to-peer marketplaces – through a review of the classification of the sharing economy and by presenting the terminology used in this paper.

1.1.1 Rise & Significance

In the turn of the new century, a rebranded form of economic activity made its appearance in our society. Powered by the advent of the digital age for all and bolstered through new attitudes toward consumption and ownership, a vision of the economy based on collaboration has been thriving in societies all around the world. What is commonly referred to as the sharing economy is radically altering consumer behaviors and the dynamic of the exchange of goods and services on a major scale (Botsman & Rogers, 2010; Möhlmann, 2015).

Back in 2011, TIME magazine nominated the sharing economy as one of the “Top 10 ideas that will change the world” (Walsh, 2011). This umbrella-concept actually embraces various new transactional formats (Avital, Carrol, et al., 2015; Belk, 2013; Selloni, 2017) that are seen by their proponents as a more sustainable model for organizing the economic activity (Möhlmann, 2015; Neilson, 2010; Rifkin, 2000). The irony is that the ideas behind this movement are actually taking us back to old market principles and collaborative behaviors that have been hardwired in our minds from practices in the earliest periods of mankind. Today, they are just being reinvented in ways that are relevant to the modern age (Botsman, 2012).

The pioneers of the new collaborative economy started slowly. When Craig Newmark sent an email in 1995 to 12 of his friends about interesting things to do around San Francisco under

the subject “*Craig’s List*”, he had surely not imagined that it would grow into the 54th most visited website in the world 20 years later (Fine, 2016). The success of such collaborative styles of exchange is fostered through the increasing positive attitude toward sharing and the willingness of people to collaborate throughout our cultural, political and economic systems. According to report from PriceWaterCooper (2015), 19% of the total US population had already engaged in sharing transactions and 72% of them declared that they could see themselves becoming a regular user within the next two years. Sharing behavior is real, relevant and on the rise.

Fuelled by increasing expectations from the market, sharing platforms are flourishing across the Internet from every part of the globe and throughout the majority of industries (Botsman & Rogers, 2010). In Europe, several hundred sharing economy startups were founded in 2016 alone (Vaughan & Daverio, 2016) across various sectors: cars, tools, parking spots, music lessons, pets, money and even companionship.

Currently, four out of the five most valuable start-ups in the world - i.e., the famous unicorns - are online marketplaces active in the industries of transportation, hospitality and entertainment (CB Insights, n.d.). However, because of its decentralization, its many different shapes and the relative novelty of the movement, the feasibility of measuring the size of the sharing economy appears compromised. While some projections value the sector at \$335 billion globally by 2025 (Marchi & Parekh, 2015), Mastercard (2017) estimated that the size of the transportation and shared accommodation sectors alone would reach \$500 billion in 2020.

Sharing platforms typically present an attractive cost structure due to the scalability of their digital business model. They usually deal with insignificant marginal costs which make them poised to benefit from large economies of scale. Barry Libert, contributor to the Harvard Business Review, identified network orchestrators¹ as the category of companies that presents the highest average valuation – i.e., more than 8 times their current revenue (Libert, Wind, & Beck, 2014).

¹ Network orchestrators are described by the author as platforms of peers in which participants create themselves the value through sharing and interaction. Examples of orchestrators are Facebook, Uber, Alibaba and Visa.

The sharing economy is gaining in popularity thanks to the rising adoption of the market and the development of innovative sharing solutions across the spectrum of industries. The recent history of the sharing platforms has shown that the market is ready to embrace new models that introduce innovative formats of interaction between people. It is likely that collaborative models of economic activities are here to stay and will keep on drastically disturbing the social norms and the established economic models with innovative business applications.

1.1.2 Enablers & Drivers

To understand the success of the sharing platforms and hope to extract the drivers of their success, we must try to look at their origins. Their emergence and sustained growth can find their roots at the crossroad of a complex web of seemingly disconnected trends that has enabled and has been driving the participation of individuals to the movement. It is the convergence of economic, environmental, psychological, sociological and technological factors that created the breeding ground on which the sharing economy has risen and gained the popularity that it benefits from today.

The industrial progress made during the 19th century gave way to a period of *hyper-consumption* in the 20th century. Consumption was then the primary driver of the economy, which led to see ownership of goods as economically and socially desirable. G. W. Bush claimed shortly after his reelection of 2004 that “*the more ownership there is in America, the more vitality there is in America*” (Ownership Society, 2018). This statement acts as a testimony of a time when materialism was exacerbated by all components of society and people were happy to take on loans to acquire goods and possessions that they could otherwise not afford. This dynamic came to a halt when the 2008 financial crisis hit. For many, it is seen as the catalytic event that fostered the emergence of the modern version of the sharing economy (Ballard, 2015). The shock was exacerbated by a wave of governmental austerity which added to the financial precarity of consumers and further altered beliefs and perceptions. As people’s bank accounts and net worth started to deplete, the same people started to reflect on their consumption and looked for more cost-saving solutions. In parallel, the pillars of the old economy suffered from a growing distrust from consumers. The rising skepticism of people toward traditional brands and institutions that had previously failed them reinforced the positive attitude toward innovative transactional models. The possibility to access cheaper goods and services by consuming collectively rather than separately has emerged as an

economically attractive alternative to the failed excesses of the previous models (Frenken & Schor, 2017).

In times of crisis, people tend to reevaluate their behaviors in light of new learning and beliefs. The dogmas of the capitalistic model had shown their limits during the recession and the consumerism behavior, vital to its functioning, appeared to many as an unsustainable way of achieving a stable economic growth. People started to view the act of sharing as a post-crisis antidote to the materialism and the overconsumption that plagued the 20th century (Conte, 2016). The exemplifying idea that a car stands idle 95% of the time sunk in the minds of consumers (Barter, 2013) and made them realize the unsuspected benefits of becoming less dependent on ownership (Frenken & Schor, 2017). This realization initiated a paradigm shift from *possession* to *utilization*. More and more, the importance of ownership was weighed against the personal value given to the service actually received. The actual usage of a product was seen as its main value determinant (Barros, 2013). Furthermore, already-used products were also increasingly accepted as viable alternatives when they could provide the results desired (Scholdan & van Straaten, 2015). When materialism proved its shortcomings, the idea of sharing possession rather than owning it reemerged as socially acceptable, even desirable.

Similarly, another crisis boosted the already-attractive appeal for sharing forms of economy. Schor (2010) argued that the recent awareness toward environmental issues has had a radical impact on people's beliefs and consumption behaviors. It is widely believed that sharing-based consumption can help reduce the negative environmental externalities of the economy due the larger extraction of value from underused assets and the smaller amount of energy needed in production capacity. It has been further demonstrated by Lamberton and Rose (2012) that the perceived scarcity of resources and negative externalities of consumerism behaviors have increased the attractiveness of shared models of consumption due to their minimized destruction of resources.

Authors have also noticed a general resurgence of a network-based society fuelled by a increased openness to exchange within a community of previous strangers and the greater appreciation of online interactions as acceptable social activities (Botsman & Rogers, 2010; Selloni, 2017). They highlight the valuable redesign and appealing rebranding of forms of collaboration as an active evidence of a trend that they labelled as the *resurgence of communities* (Botsman & Rogers, 2010). After the isolation and egocentrism that had

characterized the previous century, people have now been striving for human interactions and have tended to display greater concerns about their neighbour. Van de Glind (2013) found that connecting with and helping someone in need through sharing also brings a sense of satisfaction and enjoyment to people. The 21st-century society has come to shed a positive light on behaviors perceived as altruistic and the resulting sense of personal contentment helps the sharing economy being seen as a desirable model of transaction for many people. Frenken & Schor (2017) have identified a desire of connecting with strangers through sharing platforms from which new social bonds can arise. The social character of sharing is therefore a powerful stimulus behind the trend popularity.

Strong of a new demand, sharing companies started to emerge. Assisted by the rapid series of technological advancements of the last decades, they offer a new value proposition through digital and disruptive business models which reinvents the firms-consumers dynamics of exchange. Already in 1987, scholars predicted that the progress in Information Technology (hereinafter, « IT ») would reduce the costs of transaction and coordination to consequently initiate a shift from firms to markets as the coordinator agents of economic activities (Malone, Yates, & Benjamin, 1987; Möhlmann, 2015). The shock of 2008 only accelerated the change of consuming attitudes and behaviors of people. As Sundararajan (2016) pointed out, the penetration of mobile phones, equipped with GPS technology, coupled with the globalised wireless broadband and the rising popularity of social networks created an ecosystem that allowed individuals to stay constantly connected and interact with each other. The coordination cost of matching the demand for goods and services with their supply found itself drastically reduced (Schor, 2014; Smith, 2016). Parallel developments in the areas of online payments and digital identity management upgraded the opportunity from *interaction*, to *transaction* between strangers by similarly decreasing the costs of transactions (Benkler, 2004; Hawlitschek, Teubner, & Gimpel, 2016). In short, the centralized governance mechanisms of firms are proving themselves less and less attractive as digital technology enables faster, cheaper and further-reaching transactions directly between individuals. The same way that technological advancements have allowed the relative decentralization of economic coordinators, new innovations in the fields of IT could lead to deeper decentralization in the future.

Past researches have concluded that the most prevalent reasons why people participate in sharing platforms are instrumental motives such as monetary and convenience elements

(Hamari, Sjöklint, & Ukkonen, 2016; Lamberton & Rose, 2012). A recent EU Research Project has identified *social-hedonic motives* such as community and fun as well as *normative* motives such as altruism and sustainability as respectively second and third most decisive factors to participate in online sharing (Andreotti et al., 2017).

As it appears, the popularity of sharing consumption behaviors is unevenly distributed across the population and is correlated to socio-demographic characteristics. Unsurprisingly, researches have shown that younger generations are more adept in the phenomenon (PriceWaterCooper, 2015; Smith, 2016). Understandably, people between 18 and 45 – i.e., the so-called *Millennial* generation and onward - have overall experienced lower employment level and smaller disposable income than their predecessors. These elements have led to a difference in priorities and expectations. Born in the digital age and savvy of the new technologies, they are comparatively more able and comfortable to transfer social and economic behaviors in the digital space. A survey from Goldman Sachs Investment Center also found that younger generations are more likely to put off commitments, acquisitions and to be satisfied with the access to the usage of an asset rather than with its ownership (Goldman Sachs, n.d.).

In 1988, Belk argued and theorized that you are what you own. 15 years later, the same author claimed that you are what you can access (Belk, 2013). The new attitude of *access over ownership* for high and low-value assets alike gave rise to a wide participation in sharing platforms and uncovered opportunities lying in the area of innovative business models development. The focus of these new models must be primarily put on the prime motives behind the lessening of materialism, which are *instrumental features* such as decreasing the costs borne by the consumers and increasing the convenience of access to the service. These are the prime elements of a successful value proposition that resonates with potential users, especially with the Millennials generation. In addition, the appeal of the social benefits associated with the use of a collaborative platform has been established as important in the eyes of the consumers. Creating a sense of (re)established communities and strengthened connections between individuals can be positively valued by users and increase their loyalty to the platform. Finally, altruistic behaviors and environmental concerns are also driving consumers' interests.

1.1.3 Disambiguation of Terminology

Despite the abundant common and scientific literature on the subject, there is yet to be a terminological consensus on the sharing economy and its related concepts. The term was used interchangeably to describe the renting, sharing or exchanging of resources or services, usually using means of the Internet, through a crowd-based services or intermediary without any permanent transfer of ownership (Belk, 2013; Botsman & Rogers, 2010; Hamari et al., 2016). Within the IT academic community, it is used by different authors as an umbrella-term to refer to various phenomena such as *Collaborative Consumption*, *Commercial Sharing Systems* or *Access-Based Consumption* (Bardhi & Eckhardt, 2012; Hawlitschek, Teubner, & Gimpel, 2016; Lamberton & Rose, 2012; Botsman & Rogers, 2010). Botsman, pioneering author on the modern form of collaborative consumption states that “*the Sharing Economy lacks a shared definition*” (2013, para. 1) further asserting that “*we need clear definitions that will enable us to move forward with a common understanding*” (Botsman, 2013, para. 4).

We recognize the confusion surrounding the terminology as the consequence of the perceived novelty of the movement. Despite the resurgence of the collaborative form of transaction, authors have been numerous to point out that sharing (in all its forms) has almost always existed through civilizations (Avital, Carrol, et al, 2015; Sahlin, 1972). However, the basic ideas are being extended and consequently rebranded. The potential of sharing has been recently stretched to new horizons with the emergence of *stranger sharing* (Schor, 2014). Previously constrained within the boundaries of familiar and trusted social networks - e.g., family, friends, neighbors, etc. -, the new sharing economy enables people with no history of interactions to transact and trade (Frenken & Schor, 2017). The degree of trust formerly cemented in the prerequisite nature of the relationships is now being projected into new dimensions in the context of sharing economy.

In addition, this confusion can be understood by the ongoing innovations and changes of this new market, requiring constant updates and reclassification to keep up with its evolution. Some authors have struggled to recognize Uber and other major peer-to-peer platforms as true to the original meaning of *sharing* which refers to the (re)distribution of usage of an underused asset and the enabling of access over ownership (Botsman, 2015; Botsman & Rogers, 2010; Selloni, 2017). This original definition implies the participation of non-professional individuals on both ends of the platform. However, the increasing popularity on the demand-

side encouraged suppliers to professionalize themselves and solely rely on this occupation for income (Meelen & Frenken, 2015), either by promoting themselves from part to full-time – i.e., individuals in need of a source of revenue becoming a full-time Uber drivers - or migrating from their original ecosystem to the digital platform – i.e., real estate companies listing their properties for rent on Airbnb. On top of that, *sharing* in its purest form implies the empowerment of the individuals directly affected by the exchange. In some instances, the decision-power centralized in the platform – e.g., Uber unilaterally fixing ride tariffs – hinders the obvious inclusion of the relevant ecosystems into the definitions in use in the literature.

For this paper, the construction of our own understanding of the sector has been influenced by the work of Grybaitė & Stankevičienė (2016) who have developed a clear yet flexible framework based on Botsman's classification (Botsman, 2013; Botsman & Rogers, 2010). This framework is helpful to understand the arrangement and the relations between the different concepts. A visual representation of this classification is presented in exhibit A of the appendices. At its basis, the *Collaborative Economy* is composed of four dimensions: *Collaborative Education*, *Finance*, *Production* and *Consumption*. Botsman (2013) further categorizes *Collaborative Consumption* into 3 distinct classes:

- (i) *Collaborative lifestyles*: trade non-product assets such as time, space, skills and money, largely composed of On-Demand service platforms such as Airbnb, The Lending Club or TaskRabbit.
- (ii) *Redistribution markets*: seek to redistribute underused goods such as second-hand platforms like eBay and craigslist.
- (iii) *Product services systems*: enable people to pay to temporarily access the benefit of a product instead of having to acquire it such as Cambio and Xerox pay-per-copy model.

The different platforms can implement either a traditional B2C dynamic – i.e., grouping providers and reoffering the aggregate supply to obtainers - or direct peer-to-peer exchanges – i.e., connecting suppliers with obtainers directly on a one-on-one relationship. The scope of this paper is limited to the study of peer-to-peer sharing platforms for the development of its own application. For the sake of clarity, we will further identify the object of the study as *peer-to-peer marketplaces* or *peer-to-peer platforms*, with the collaborative aspect implied in this term. It is worth noting that our interpretation encompasses what Belk (2013) identifies as

pseudo-sharing such platforms hosting long-term renting and leasing, short-term renting, online sites “sharing” your data and online-facilitated barter economy.

Futhermore, because of the dynamics at play, the consumers of these platforms can alternate between the roles of *provider* and *obtainer*, switching from one to the other depending on their actions on the platform, which is one of the key differentiating elements from conventional consumption. Due to the ambiguity of the term *consumer* in the context of peer-to-peer dynamics, we will refer onward to the individual accessing the service through a platform as the *obtainer* and the one supplying it as the *provider*. The terms *consumer* or *customer* will hereinafter refer to the users of the platform, regardless of primarily being acting as an *obtainer* or a *provider*.

In this section, we have begun to highlight the relevance of the phenomenon of sharing as a major economic activity. Thereafter, we attempted to identify its drivers in order to extract the key factors of success of a sharing platform. It appears that economic and convenience motives, as well as social-hedonic and normative motives incentivize people’s participation. Eventually, we clarified the scope of this paper by restricting its study to *peer-to-peer marketplaces* which connect individuals through a platform for the obtaining and providing of services.

1.2. Online Peer-to-Peer Marketplaces

« *With great power comes great responsibility. These are platforms with hundreds of millions of people.* »

Dave McClure, n.d.

Following the clarification of the object of our study, we use this section to dive deeper into the models of online peer-to-peer marketplaces to better understand their business models and the dynamics that are at play between the different actors of the platforms. Thereafter, we lean closer on the current and major criticisms voiced toward these platforms and on the risks associated with their use.

1.2.1 Generic Model of Online Peer-to-Peer Marketplaces

Traditional online peer-to-peer marketplaces are essentially composed of three parties serving different but complementary roles. On the one hand, the supplier-side offers a resource (usually under-used, whether it is tangible or not) that they own for selling, renting or co-using with the aim to generate additional value. On the other hand, the obtainer-side seeks to benefit from this resource through buying, renting or experiencing it. In the middle, the platform serves as an intermediary, connecting providers and obtainers and enabling the exchange of resources between them. The application of peer-to-peer platforms spreads across industries and sectors – i.e., finance, real-estate, labor market, transportation, technology, etc. - and usually offers services at lower fees while allowing a higher degree of customization than their traditional counterparts.

The dynamic of these platforms is to effectively match the *needs* and *haves* of the community to unlock the underexploited value of an asset through digital technologies (Botsman, 2015). Additionally, they enable communication, transactions, payments and mitigation between sharing partners. As network orchestrators (Libert et al., 2014), online peer-to-peer marketplaces rely on consumers to both provide and obtain the assets exchanged on their platform. In other words, the network value is generated by consumers themselves, while the platform merely facilitates and incentivizes the participation of individuals. By creating an ecosystem gathering both supply and demand that is supported by exchange-facilitating tools, these platforms reduce the coordination costs - i.e., matchmaking efforts - as well as the transaction costs (inevitably caused by geographical constraints and the lack of trust in direct peer-to-peer transactions) borne by consumers (Stanoevska-Slabeva, Lenz-Kesekamp, & Suter, 2017).

Peer-to-peer marketplaces aim to take full advantage of the network effect to expand and sustain their growth. As pinned down by the extension of Metcalfe's Law, the value of a network grows as the number of its users increases (Hendler & Golbeck, 2008). Effectively, each additional user increases the value of the platform for all others. This also leads to a bandwagon effect: the enhanced value of the network renders it more attractive to non-users who might decide to join. These newcomers, in turn, bring additional value to the network and so on. Researchers and businessmen alike have imagined a point where this virtuous

circle of value creation becomes self-sustainable and identified the concept of Critical Mass of Users (hereinafter, « *CMU* ») - i.e., the number of users needed to make a service or a product efficient and its growth sustainable. Many startups have harshly learned that reaching the CMU is no easy task, as most online platforms fail to attract sufficient usage and become useless. In contrast, if managed properly, a platform can generate sufficient curiosity and excitement to grow and to keep on generating steady positive value to increase its number of active users.

In addition, the typical cost structure associated with digital platforms also makes the case for growth. Successful platforms are defined by their scalability - i.e., their ability to grow and manage their increasing demand. The cost structure associated with these platforms is characterized by the low marginal costs incurred by the addition of a new user. Effectively, the onboarding of new consumers dilutes the fixed costs of developing and maintaining the platform. The economies of scale enabled by their digital structure make these types of businesses capable of extracting ever-growing profits once they have reached their break-even point. In contrast, additional demand usually entails additional capacity investments for traditional B2C models that need to be anticipated through their forecasts. User-generated supply, on the other hand, usually benefits from their ability to adapt to the real demand with greater reactivity, more precision and lower risks of investment.

Einav, Farronato, and Levin (2016) have worked on developing a theoretical model to conceptualize the competitive advantages of peer-to-peer (hereinafter, « *P2P* ») marketplaces compared to their business-to-consumer counterparts (hereinafter, « *B2C* »). In their views, even if marginal costs of production are lower but fixed costs are higher in B2C rather than in P2P, B2C players will have a cost advantage until their capacity constraint is reached. Only after that, P2P players will fill up the demand in surplus.

By contrast, if marginal costs are lower for P2P players, they may push B2C incumbents out of the market provided that entry costs are not too high. This is why P2P marketplaces are likely to fail in the face of their B2C competitors in sectors characterized by heavy fixed costs that have already developed intense economies of scales on the condition that these economies have been passed on to the price paid by consumers (Codagnone & Martens, 2016). However, this explains why P2P players are particularly successful in markets where their models have reduced the costs of entry by relying on individuals' assets. High-fluctuating

demand markets such as transportation, hospitality or short-term labor are particularly fit to be served by these types of companies considering the capacity of adaptation of their supply. Cherry on top, the extracted margins per usage are usually greater due to the specificity of their light costs structure (Hagui & Rothman, 2016). As of June 2018, Lawpath (n.d.) had identified 14 sectors in which online marketplaces are increasingly active and taking market shares from incumbents, among which retailing, food & drink and education.

However, this is not necessarily a good thing for consumers. Online marketplaces benefitting from a strong network effect and significant scalable abilities tend to evolve into monopolies within their own industry or geographical area much like the examples set out by the GAFA - i.e., Google, Apple, Facebook & Amazon. Frenken and Schor (2017) have argued that the expected redistribution of income and welfare usually expected from sharing practices does not automatically materialize as leading network orchestrators concentrate traffic and market power to eventually capture the economical surplus generated. This argument converges with Belk's definition of *pseudo-sharing* (2013) mentioned earlier. These platforms are primarily driven by economic motives and by the reciprocity which characterizes the exchange between individuals. In addition, some of them are also characterized by the disposability of their consumers. For instance, Uber needs drivers but no specific driver is special. Drivers are essentially disposable as long as there is a sufficient number of them to meet the demand. As the platform sets the price itself, some drivers are forced to work long shifts and hours to make a minimum income. For some observers, this kind of use of monopolistic position is not beneficial to the social good and economic health of the market as people are put in a state of reduced choices and unstable financial autonomy.

The authors further argued that some platforms' valuable assets are gathered within a small group of people and through peer-to-peer platforms, the owners of such assets can turn their consumer goods into capital assets to earn annuities. In addition, Frenken and Schor (2017) puts forward that on-demand platforms are likely to increase inequalities within the bottom part of the income distribution since educated providers are capturing market opportunities through on-demand skills such as driving and cleaning that were previously the realm of lower educated people. In short, the promises of welfare redistribution claimed due to the increase of surplus on the obtainer-side is likely to be counterbalanced by economic inequalities emerging.

In conclusion, online peer-to-peer marketplaces are well positioned to offer services at lower costs, relying on their providers' availability and assets, and leverage their digital platform to match supply and demand more effectively. Their supply flexibility and cost structure enable them to outperform traditional B2C platforms in sectors characterized by high fluctuating demand and where the assets supplied can almost completely be outsourced to individuals. However, their scalability and their network effect tend to turn these platforms into monopolies, some of them using that market power to coerce their consumers' base into following their unilaterally imposed rules. There is growing discontent among the users against some marketplaces such as Uber because of their abuse of power and the little freedom that they leave to their community members to decide on their own terms of labor. As this information leads to believe, there are some flaws within the value proposition of the existing business models that may be overcome with the introduction of a better distribution of the decision-making power and redistribution of the platform's gains.

1.2.2 Risks of Online Peer-to-Peer Marketplaces

The shift of paradigms from firms to markets implied the re-utilization of communities. In the history of mankind, communities were formed among people with previous references about one another which allowed them to evaluate and measure each other's character and assess the risk of interaction based on their personal experience. However, the advent of Web 2.0, the so-called *Social Web*, changed the game field. The Social Web refers to the platform of applications using the Internet as a technical medium to create User Generated Content (Chehimi, 2013). In contrast with Web 1.0, which limited users' experience to the passive viewing of online content, Web 2.0 allows people to interact and collaborate in a virtual community as it is the case for social networks. For the first time in history, individuals with no previous record of interactions could exchange information efficiently on a global scale.

One of the big issues arising as the adoption of this new technology picked up was the accuracy of the information shared. Suddenly, everybody was given the opportunity to post and share online about every subject regardless of their competence. Yet, there was a lack of data available about the background, the character and ultimately the reliability of the source of the information, which lead to suspicion and mistrust (Zacharia, Moukas, & Maes, 2000). To increase the credibility of shared information, people re-gathered themselves within online communities and started to establish mechanisms within them to verify information's origins and exactitude. New players in charge of these communities emerged in this digital

ecosystem: the network operators. Adequately, they positioned themselves as the guardians of their platform to control their users' interactions and to safeguard their interests.

Rapidly, operators started to build risk-reducing mechanisms to facilitate seamless and reliable exchange of information. Famously, Wikipedia has implemented a business model based on the principle of *knowledge crowdsourcing* - i.e., distributed intelligence. The Wikipedia community has users contributing with their knowledge as well as verifying the validity of other users' contributions to ensure that no erroneous information is conveyed through their platform. This mechanism has proven itself to be fairly robust despite some notorious, not symptomatic but in our opinion, missteps. As a result, Wikipedia is seen as a trustworthy recipient of knowledge for countless subjects thanks to the pulled efforts of its community.

However, knowledge crowdsourcing has its limits and is not applicable in every situation. Ultimately, the availability of the information in question determines the fitness of knowledge crowdsourcing application. Expert knowledge, for instance, is shared and discussed among academic groups of peers which publish and review on that specific subject. Being able to take part and contribute to these circles requires a high level of expertise and the wisdom of the crowd would hardly be of any use. In short, the deeper the expertise, the smaller the group of individuals detaining the information and the less relevant the recourse to knowledge crowdsourcing.

On the other hand, knowledge crowdsourcing comes in handy in the sectors of hospitality, investment analysis and to review users credibility for instance. When it is applicable, resorting to the crowd helps reduce the risks of wrong information being shared and build trust among users. TripAdvisor, a tourist information platform, allows users to collectively evaluate places to visit, stay and eat through a system of peer contributions and reputation scores. Leveraging their network effect, the combined experience of thousands of travelers provides guidance to others on where to go and what to do. Quora, another example of online knowledge-sharing community, has taken this principle to the extreme by inviting users to ask any question in any way they like and letting the crowd decide which response should emerge as the best answer via a system of "*up and down*" votes. The platform is particularly useful because it facilitates the creation of content while sharing knowledge with a credibility score based on its users' contributions and interactions.

In the context of peer reviews within a sharing platform, the quality of peer evaluations is proportional to the number of peers contributing to it. Following statistical principles, the more reviews are given to a specific item, the more the readers of these reviews can be reassured that the overall evaluation matches the reality. This is, in part, due to the offsetting of the relative subjectivity of each review (Haralabopoulos, Anagnostopoulos & Zeadally, 2016). However, a crucial assumption behind that logic is that the crowd is overall trustworthy. Platforms incentivize quality contributions by implementing a system of reputation based on the contributions of the single user. The quality of these contributions is judged by other peers that stimulates high-quality content. But eventually, all these certification systems rely on the users to be trustworthy to convey the correct information. If the community appears to break that trust bond and tends, willingly or not, to misrepresent the reality, knowledge crowdsourcing loses its reliability and the online community loses its value. As an example, Sybil attacks can willingly distort the reality represented through online rating mechanisms and affect the system's credibility.

Most online communities only require a low identity verification process from their users – e.g., self-declared name, age, date of birth and interests. This process is obviously subject to abuse as the lack of background checks on the information that is declared makes it easy to mask their users' identity (Ridings, Gefen & Arinze, 2002). With a view to building trust within their community, platforms should be incentivized to impose stricter rules of validation for users' identity and contributions, but they deliberately do not do so. In fact, doing so would likely limit the usage of the platform. The apparent openness and seamless access to their platforms are key to help them reach CMU and not discourage prospective users to sign into the community. As a result, platforms attempt to identify fake users, social bots or even spammers only after they have joined the platforms by detecting suspicious behaviors. In many ways, they simply bet on the relative non-significant consequences of the fake users that would not be detected by their system.

As a matter a fact, network orchestrators can afford these imperfect verification mechanisms as long as their members simply *interact* with each other but do not *transact*. The difference is that while interactions deal with exchange of *information*, transactions deal with exchange of actual *value*. Misrepresentations in the case of transactions are far more consequential as value is more sensitive. Online marketplaces such as eBay, Airbnb or Etsy have implemented reputation systems leveraging knowledge crowdsourcing to allow participants with a relevant

history of transactions to evaluate the quality of their service and give an overview of users' trustworthiness. Nevertheless, they run into the same issue as online communities – i.e., mostly relying on other individuals' contributions. This time, however, for the users of online marketplaces, the risks of misrepresentation of the information can be far more substantial – e.g., personal injuries, property damage, theft, non-payments and lawsuits (Devine, 2014). Marketplaces orchestrators implement feedback and reputation systems as well as self-regulating policies, identity verification and insurance policies among others in their attempt to decrease the level of risk associated with transaction on their platform perceived by consumers (Hsu, Ju, Yen, & Chang, 2007). In addition, new technological developments such as *smart lock*, which provides the lessor of an asset with a temporary digital access code to the asset exchanged, reinforce the tools available to offer users greater security during transactions (Frenken & Schor, 2017). New forms of insurance aim at reducing the risk supported by each participant as well in order to win over risk-averse users. Despite these efforts, studies have shown that 67% of consumers' concerns about the sharing economy are trust-related (Campbell Mithun, 2012), either with respect to the integrity of the item shared, the trustworthiness of the peers or the reliability of the platform.

For some providers, the sharing economy has grown out of its original complementary occupation. As discussed in the last section, some providers have professionalized themselves on these platforms that many saw as a promise for more jobs and wealth creation. From a provider's perspective, however, the extent of the reliability of their online peer-to-peer occupation is also a source of risks. Marketplace orchestrators are struggling to find the balance between reducing cost and fostering flexibility for their obtainers on the one side and ensuring stability and safety for their providers on the other side. In the meantime, the risks associated with providing goods and services on these platforms are greater because of physical injuries, property damage or lawsuits that may fall at the costs of the individual alone without any support from the marketplace orchestrator.

Considering the assets at stake and the level of risk supported by individuals, online peer-to-peer marketplaces must inspire, and instill, a greater degree of trust on their platform. The requirement of a trusting environment is critical for the future of online sharing. It has been identified by scholars to be one of the main determinants of participation to online peer-to-peer marketplaces and has been one of the main research objectives for peer-sustained electronic commerce and sharing economy platforms as a whole (Hawlitschek, Teubner, Adam,

et al., 2016; Sundararajan, 2016). The elements presented in this section make the case for orientating this paper toward the study of trust and its components in order to influence users' participation.

1.3. Trust, its Role and its Components

« Trust has been described as the key building block of society. »

Mazzella, Sundararajan, D'Espous, & Möhlmann, 2016, p. 27

Considering the critical importance of trust outlined in the previous section, we turn the next focus of this research on its origins and its effects. Thereafter, we study the relevant literature to assess the way that it has been treated by scholars in the context of digital ecosystems. Reviewing theoretical conceptualizations of the notion, we select a relevant model to use in this paper.

1.3.1 A Brief History of Trust

Humans strive to predict and control, or at least understand, their social environment. In our socially intertwined societies, the same individuals feel the need to *know* how their behavior is going to affect the behaviors of others and how the behaviors of others will affect them in return. In practice, human interactions necessitate the consideration of a vast number of different possible interrelated behaviors that other individuals might exhibit (Gefen & Straub, 2004). However, while norms, customs and traditions help reduce the panel of possible actions, individuals essentially remain complex beings acting as independent agents. As a result, their behaviors cannot always be properly predicted due to their potential irrationality or inconsistency in the eyes of their counterparts (Gefen & Straub, 2004). When explicit or tacit social rules of conduct fail to provide a satisfactory predictive framework, trust steps in to act as a substitute guarantor of the materialization of the expected outcomes of a relationship (Kelley, 1979; Kelley & Thibaut, 1978).

The concept of trust is complex and its definitions, sources, causes and characteristics often depend as much on the field of research studied as on the circumstances of the context in question. Nonetheless, some common themes can be extracted from these multiple facets: trust is neither a behavior nor a decision, but rather a psychological construct that is developed under specific conditions of risk and interdependence and that influence an individual's expectations toward some uncertain future events (Chen & Dhillon, 2003). Because

of its capacity to mitigate apprehensions, past researches have highlighted the importance of trust in building interpersonal and commercial relationships marked with uncertainty and vulnerability (Mittendorf, 2016). In this paper, we rely on Mayer, Davis, and Schoorman's definition of trust, identified as "*the willingness of a party [note: hereinafter identified as trustee] to be vulnerable to the actions of another party [note: hereinafter identified as trustor] based on the expectations that the trustee will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party*" (1995, p.5)

Furthermore, studies have found that the level of trust projected between entities grows with the dependency on one another and with the increased vulnerability to each other (Mittendorf, 2016). For that reason, scholars have highlighted its importance in various fields characterized by high degree of uncertainty and perceived risks such as e-commerce, online communities and sharing economy (Chen & Dhillon, 2003; Weber, 2014).

To clarify, all economic systems need trust to enable transactions among individuals. The exchange of value between participants usually takes place within a regulated environment that restrains to certain extent opportunistic behaviors from participants – e.g., the recourse to enforceable commercial contracts or the use of an unbiased third-party to execute transactions when specific conditions are met. However, these mechanisms can never fully eliminate the uncertainty which remains inherent to a transaction. As long as participants remain vulnerable to the actions of others, trust is required to bridge the gap between uncertain and expected behaviors. In a commercial context, trust is seen as the measure of confidence that a counterpart will act in an expected manner and refrain from opportunistic behaviors in the absence of total control and predictive capacities (Williamson, 1993). In other words, *trust* is the belief that the trustee will fulfill the trustor's expectations without exploiting the vulnerabilities of an incompletely regulated system (Pavlou & Gefen, 2002). Effectively, it compensates for the perceived risks of engaging in a transaction. The recourse to trust is therefore decisive to enable transactional relationships to take place within an uncertain and risky setting.

On this previous point, Sunderarajan (Leyden, 2016) argues that major economic expansions undergone by society were induced by the injection of a new format of trust that had extended the frontiers of our regulated commercial environment. From the Ancient Roman governments stepping in to raise up the food standards in order to boost the consumption of

agricultural products to the introduction of the courts of law and the ability to write and enforce contracts, the development of institutional substitutes for interpersonal trust allowed for new opportunities of trade to be explored. Nevertheless, while every shift from one economic model to another altered the recipients and the levels of this trust, its fundamental role remains crucial and very much needed (Brodersen, 2017; Botsman, 2015; Möhlmann, 2015; Möhlmann, 2016). Therefore, it can be perceived that new forms of trust mechanisms are desirable to achieve further economic development and enable trade to take on greater proportions. However, the impact of these mechanisms on the relations of trust among entities needs to be carefully studied in order to fully exploit their benefits.

The requirement of trust to enable transactional relationships holds especially true for socially distant relationships, where complexity and uncertainty are exacerbated - as it is the case for online interactions and sharing behaviors (Mittendorf, 2016). In the digital environment, trust has been identified as the fuel that powers the sharing economy (Sundararajan, 2015). As introduced in the second section of this chapter, the advent of *stranger sharing* uncovered the necessity to trust unknown peers. An occurrence previously constrained within familiar and social circles, interactions and transactions have been allowed to take place among people with no prior history of relations due to the digitalization and the globalization of our economy.

In their traditional forms, these transactions take place under the policing of intermediaries acting as trusted third-parties, providing assurance and reducing perceived risks for both sides. Peer-to-peer platform providers have adequately positioned themselves as the chaperon of transactions between individuals that have no reason to blindly place their trust in each other. Even more adequately, they have been implementing costly mechanisms to foster trust *(i)* between users – e.g., reputation systems, identity verification, profile display, etc. -, *(ii)* toward the platform itself and *(iii)* with respect to the asset exchanged. Maybe one of the most effective trust-building mechanisms of all is the quality of the service provided. This way, John (2013) has demonstrated the positive role played by previous experiences of online participation, even social networks, on the trust perceived by users and on their inclination to participate in the future.

Trust is therefore both a prime requirement for transactions to take place within online peer-to-peer platforms and the target of great efforts from sharing platforms in their attempts to

increase their popularity. By essence, the drivers of traditional trust are local (Leyden, 2016), but the advancement of our technology has expanded the boundaries of our commercial opportunities beyond geographical reach. This new digital economy must be supported by a robust trust grid that effectively fosters its development. But trust is a complex and subjective concept which requires a comprehensive analysis of what constitutes and drives it in order to properly translate these factors into the digital world and on a global scale.

1.3.2 Past Conceptualizations

As we have seen in the last subsection, trust is a key determinant of the willingness to engage with another party. Trust has been treated as an interpersonal element by scholars, meaning that characteristics of both parties come into play to determine the level of trust projected from a trustor toward a trustee. Most researches conclude that trust is the result of the combination of the *general trust attitude* of a trustor and the *trustworthiness attributes* of a trustee (Gefen, Benbasat, & Pavlou, 2008). Mayer et al. (1995) have identified the *propensity to trust* of the trustor as a key antecedent to trust. Some authors have chosen to study the *propensity to trust* as a variable dependent on contextual elements (Mittendorf, 2016; Sitkin & Pablo, 1992) while others have approached the trust characteristics of the trustor as stable over time and situations and as the result of educational, social, cultural and personal experiences (Hawlitschek, Teubner, & Weinhardt, 2016). In this paper, we will define the propensity to trust as the likelihood of a party to trust others prior to any data on that particular party being available (Mayer et al., 1995) based on a general naivety toward others or a personal faith in humanity. While we recognize the importance of the trustor's characteristics in the equation of trust, its study is beyond the scope of this paper which focuses on the trust characteristics of the trustee – i.e., their attributes of trustworthiness.

Trustworthiness is a perception of the trustee by the trustor. Eventually, the attributes of trustworthiness are controlled by the trustee through the signals that they project to the trustor. In contrast, *trust* itself refers to the behavioral intention of the trustor to engage in a relationship depending on their beliefs about the trustee's *trustworthiness* (Gefen & Straub, 2004; Gefen et al. 2008). In short, the perception of trustworthiness of a trustee drives the trust of the trustor.

Mayer et al. (1995) introduced a conceptualization of trustworthiness based on the three attributes of *ability*, *integrity* and *benevolence*. According to these authors, the overall

perception of the trustworthiness of a party depends on its displayed capacity, both in skills and knowledge, to fulfill its promise – *ability* -, its apparent honesty and consistency in delivering such promise – *integrity* - and its perceived tendency to keep its counterpart's interests in mind beyond economic and egocentric motivations during the transaction – *benevolence* (Chen & Dhillon, 2003). Past researches have suggested that each attribute affects the willingness to engage in different ways. For instance, Gefen and Heart (2006) have found that perceived integrity of the trustee primarily influences the intentions to engage while its perceived ability affects the intentions to inquire about the product without actually purchasing it.

The ongoing references and use of this framework in contemporary research testify of its relevance in the context of online peer-to-peer interactions. In their research on the impact of trust on the intentional purchasing behaviors in the context of online peer-to-peer communities, Lu, Zhao, and Wang (2010) discovered that the community members' trustworthiness particularly influenced purchasing intentions. Their model consequently subdivided between the constructs of *trust in platform* and *trust in peers*, attributing to each target the three dimensions of ability, integrity and benevolence introduced earlier. Subsequently, Leonard (2012) framed a distinction between the *trust in seller* and *trust in buyer* in relation with the risks supported by both parties. Finally, Hawlitschek, Teubner, and Weinhardt (2016) enriched the previous models by adding *trust in product* to the panel of the recipients of trust while maintaining the dichotomy between the provider and the obtainer perspective.

Exhibit B of the appendices contains the final research model of trust for peer-to-peer sharing economy platforms designed and used by Hawlitschek, Teubner, and Weinhardt (2016). As introduced earlier, their comprehensive model distinguishes between the obtainer's and the provider's perspective and presents the « 3P » targets of trust model: *peers*, *platform* and *product*. The trustworthiness of each target is assessed through the dimensions of *ability*, *integrity* and *benevolence*. For practical reasons, we will refer to this modelization of reference in this paper as the 3P model. Their research examined the influence of each dimension and target on the overall Willingness To Share (hereinafter, « WTS ») of both actors¹. However, the trustworthiness of the product, itself not capable of either will nor

¹ Referring to the behavioral intentions to either obtain or provide through the platform.

intention, is only approached through the *ability* dimension. Furthermore, the trustworthiness of the product from the supplier perspective was deemed irrelevant in determining WTS as « *its abilities can be examined by the supplier anytime* » (Hawliteschek, Teubner, & Weinhardt, 2016, p. 5).

The researchers tested empirically the relevance of their model by conducting an online survey describing an accommodation-sharing scenario in the style of AirBnb. Their experiment aimed at identifying the dimensions and targets that primarily drive the WTS of participants. The analyze of the research's results suggested that *trust in platform* and *trust in peer* significantly increase both the obtainer's and the provider's sharing intentions. However, they discovered that only the *benevolence* attribute of the platform seemed to have a significant impact on the obtainer's WTS, while all three attributes were established as significant from the provider's perspective. Similarly, while all attributes of the *peer* appeared to be significant from the obtainer's side, only its ability was proven to have an impact on the WTS of the provider. Finally, the *product* trustworthiness approached by its *ability* was also deemed relevant. Additional variables such as risks-propensity were added to their linear regressions but exacerbated the previous results.

The complexity of the notion of trust and its volatility depending on the context in question constitute a real difficulty in the study of its causes and effects. While we agree with Gefen et al. (2008) that the targets and dimensions of trust must each time be reconsidered in light of the characteristics of the different environments in order to remain relevant, we believe that a framework that digs too much into deeper subconstructs can stretch the sensibility of the research participants to its limit and prove itself impracticable. Similarly, one that requires permanent adaptation to the environment in question may offer little added-value in its application. As a result, we consider 3P framework presented above as a balanced and coherent foundation for the creation of a framework adapted to a blockchain peer-to-peer environment.

This section addressed the major role played by trust in the determination of the willingness of consumers to engage in transactional relationships on a digital environment. The abundance of the literature about the matter of trust provide many insights on how to properly assess its influence in different contexts. Following our review, we have decided to select a modelization of trust that combines comprehensiveness and contemporary relevance.

Following Gefen et al.'s argumentation (2008), this framework must be adapted to the specific environment in question, what this paper will do in the subsequent chapters. The chosen framework will serve as a basis for a conceptualization of trust appropriate for the study of blockchain applications.

2. The technology of Blockchain as a Vector of Digital Trust

Blockchain has been claimed to provide an innovative architecture for interactions and transactions to take place free of the burden of trust. Naturally, the application of the technology on a trust-heavy sector such as the Sharing Economy has been identified as a potential opportunity in order to increase its appeal and further its growth. In this chapter, we will present the Blockchain technology and evaluate its potential for adoption in the lights of its maturity in order to derive potential marketing strategies for a blockchain peer-to-peer platform to successfully launch and survive. Following that analysis, we will review the *trust-free* features of the technology to assess its applicability in the realm of the Sharing Economy. In that pursuit, the development of a hypothetical blockchain accommodation-sharing will be explored and serve as a base to develop a conceptualization of trust adapted to the Blockchain ecosystem.

2.1. Blockchain Technology

« Technologies that change society are technologies that change interactions between people. »

Hidalgo, 2015.

The technological concept of Blockchain has been the epicenter of numerous discussions and reflections about the future of our society. Since its introduction to the world in the white paper “*Bitcoin: a peer-to-peer Electronic Cash System*” (Nakamoto, 2008), Blockchain has been generating as much excitement as skepticism. The unstable rise and tides of cryptocurrencies, its extensive daily coverage by mass media and public speculations have developed a great hype around what is commonly referred to as « Blockchain 1.0 ».

Gradually, the attention shifted from simple e-currency to focus on the implementation of the innovation's features in various industries (The Economist, 2015). The proof-of-concepts of

« Blockchain 2.0 », referring mostly to the use of programmable self-executing contracts called smart contracts, provides a glimpse of its potential uses across the industries. However, the promises of enhanced speed, security and transparency established in a decentralized way remain uncertain and yet to be practically implemented in viable business models.

At this stage, the technology lacks use cases and successful applications to substantiate its alleged benefits. Business and academic circles alike have started to lean in and investigate the credibility of these claims in order to distinguish what is fact and what is fiction. Despite the increasing pace of publications on the topic, the overall body of literature about Blockchain is relatively small; many areas are left in the dark and, furthermore, the existing scientific fields have yet to incorporate the technology's characteristics in the ecosystem of their research and adapt their terminology to refer to concepts common to both fields. As a result, there are many questions yet to be answered while many assumptions are left untested to this day.

2.1.1 Blockchain 1.0: Basic Protocol

Blockchain protocol enables the installation of a distributed and chronological database of tamper-proof information. Through cryptographic tools, it establishes a consensus mechanism to allow direct transactions between unfamiliar parties. It has been said to enable trust among its users without the need of control from a central authority. The decisions regarding the state of the information on the database are made through network consensus rather than by the traditional institutions.

On a technical level, the functioning of Blockchain is based on separate cryptographic mechanisms from which it derives its most useful features. Two concepts are central to the technology's terminology: *transactions*, defined as “*transition of states with ownership information, potentially including data records and transfer of control among participants*” (Xu et al., 2016, p. 2), and *Blocks*, containing the aggregated data of past transactions approved by the network.

Every participant has the ability to request a transaction through a gate of access, named a *node*¹. In the first place, the information related to the transaction is encrypted through the use

¹ A *node* is a point of access to the network (e.g., computer)

of a hash function. A hash function has the feature of returning a series of strings of systematically the same length based on any input of data provided. Moreover, the function is a one-way operation, making it impossible to retrieve the input from the related output. The inclusion of the hash output to the message prevents any alteration of its content and therefore ensure the integrity of its content.

Thereafter, the information and the hash output are signed digitally with the help of *asymmetric encryption keys*. Asymmetric encryption is a cryptographic tool that associates a private key - only known and operable by the initiator of the transaction - to a public key - accessible by all the nodes. Both keys are linked together in a way that any message encrypted with a private key can only be read with its corresponding public key. At the reception of a message, the nodes of the network can verify the authenticity of its origin by using the sending node's public key to decrypt it.

Once encrypted and signed, the message is sent to the adjacent nodes which have the ability to validate the transaction. Invalid transactions are discarded while valid ones are propagated to the network in a peer-to-peer fashion. This exponential spread ensures that the message reaches every node within a few seconds (Xu et al., 2016). Once the message reaches a *mining* node, it is included in a block with transactions that have been validated. Mining nodes have the ability to encompass messages into *blocks* and put it for suggestion to be added to the chain. If it is approved by the network, the block is propagated is added to the chain and all nodes update the state of their copies of the database to take into account the latest transactions.

The approval of the next block constitutes the central stake of the consensus mechanism mentioned earlier. While centralized networks reserve the power to make this decision to themselves, a decentralized system such as a blockchain reaches an agreement among all its users on what information will constitute a new entry in the ledger. Many options currently exist for consensus mechanisms to designate which node is given the writing right of the next block, each relying on the demonstration of a particular performance: Proof of Work for the Bitcoin protocol, Proof of Stake for the Ethereum platform or Proof of Storage introduced by Microsoft Research among others (Bashir, 2017). All these mechanisms take the form of technical riddles and have in common the difficulty to be solved but the ease to be verified by

other nodes, hence requiring miners to compete with each other in order to win the right to write the next block.

Once a specific block has been approved, it is time-stamped and cryptographically linked to the block before it. The use of a hash function on the block's information and the hash of its predecessor ensures that the data present on the chain are incorruptible. Indeed, any attempt to tamper the content of one block would eventually distort the hash of the subsequent blocks, raise flags and eventually be rejected by the protocol. In practice, a sufficient amount of time needs to pass by in order for a sufficient number of blocks to be added after a block to truly consider its information as immutable (Gipp, Meuschke, & Gernandt, 2015).

In the situation where two blocks are mined at the same time - i.e., two miners solving the riddle at the very same moment -, both blocks are added in parallel to the chain and create a *fork* in the blockchain. The existence of this fork is limited in time, as it implies two contradicting states of the database living simultaneously. The decision of which state (which fork) to consider as true is determined by the adding of the subsequent blocks. In some cases, the parallel chains can coexist for a relatively long period of time but, eventually, the longest chain will be determined as the valid by the network which will simultaneously reject the other. All transactions previously encrypted in the blocks of the invalid fork are sent back to the transaction pool where they will be processed later on. The immutability of a block is thus also subject to the final acceptance by the network in case of a *forking event*.

The benefits of Blockchain have been identified, at least quantifiably. The prime interest is the decentralized character of its infrastructure. Now, decentralization can take many forms and can be best described using the distinction suggested by Vitalik Buterin, co-founder of the Ethereum platform: *architectural*, *political* and *logical* decentralization. *Architectural* decentralization refers to the number of computers that support the system, implying its degree of resilience against its operating nodes going offline. On the other hand, *political* decentralization is about the number of entities ultimately controlling the system, hence ultimately owning the rights and permissions. Finally, *logical* decentralization designates the degree of interdependence of the system's interface and data structures. In other words, logically decentralized systems allow each of their nodes to maintain their own version of the data (Buterin, 2017).

Theoretically, blockchains are said to be architecturally decentralized. They benefit from the absence of a central point of failure compared to centralized traditional structures. It means that, regardless of the number of participants, the system remains operational if at least one mining node is connected to it. Its resilience and robustness enable it to sustain the degradation of a large number of its nodes.

By design, public and permission-less¹ blockchains present a high degree of political decentralization as well. Consensus mechanisms present within their coding structure protect the centralization of decision power to a certain extent. In some cases, consensus protocols have allowed for a certain degree of power centralization in the hands of a few. Proof of Work has seen the undertaking of significant developments in both hardwares and softwares to assemble the most able mining tools in places where resource such as electricity can be found at comparatively lower costs.

By contrast, logical centralization is what characterizes the appeal of the new technology as it allows for distributed agreement on the state and updates of the data structure. The protocol allows institutions to “*maintain a structurally consistent shared database of transactions* [among participants with contradictory interests]” (Thompson, 2016, para. 5).

Among the most cited attributes of this technology are a transparent and immutable historical record of transactions presenting blockchain network as a valid substitute for transactional exchanges. All entries in the ledger are public and available for reading to the nodes. As a matter of fact, the validation process of transactions work in a recursive fashion: the assets specified in a transaction are traced back in previous blocks until their emission through a complete read of the chain every time that they are transferred. By leveraging the efforts of the network through cryptographic mechanisms, transaction processing fee as well as processing time are drastically reduced. Another advantage put forward by Notheisen, Hawlitschek, and Weinhardt (2017) is the lowering of the asymmetry of information due to the full disclosure of the chain, increasing the efficiency of the marketplaces as defined by Bachelier (1900).

¹ *Public* refers to the feature of a blockchain to allow all its nodes to become miners by contrast with *private* blockchains on which only pre-designed entities have the right to write transactions on the chain. *Permission-less* means that everybody can access the network without prior approval from an authority as opposed to *permissioned* blockchains.

Ultimately, Blockchain technology provides for a distributed software architecture which enables conflicting agents to engage in cryptographically secured transactions and to interact without the need for a traditional centralized platform or governing authority (Ramachandiran, 2018; Xu et al., 2016).

2.1.2 Blockchain 2.0: Smart Contract Applications

Smart contracts are programmed, deployed and executed on a blockchain. The computer scientist, Nick Szabo, was the first to suggest the concept and coined the term in 1994. Today, the most prominent smart contract platform is Ethereum. While Bitcoin was the first support to effectively allow transfer of value on a peer-to-peer basis, the smart contracts it enables are basic and restricted to the e-currency. By contrast, the Ethereum platform provides developers with the possibility write their own program adapted to their ecosystem using their proprietary Solidity coding language.

Smart contracts are referred to as self-enforcing contracts. The terms of the contracts are theoretically negotiated between the relevant parties and then translated into codes on the blockchain. Once the enacting conditions are fulfilled, they self-execute the terms pre-agreed upon by creating a new entry in the ledger. Technically speaking, smart contracts are embedded into data contained in previous blocks as soon as they are submitted. Nodes, by running through all past transactions while submitting a new block, trigger the execution of the contract's terms once the enacting data are inputted.

Since smart contracts evolve within the blockchain's ecosystem, its functioning and enforcement require the involvement of a source for the information that it conveys. In case this information is not directly present on the blockchain, *oracles* are required to bridge the gap between the blockchain's ecosystem and the information present outside. An oracle is a preferably independent and unbiased actor in charge of inputting in the blockchain correct and reliable information relevant for smart contracts. The role of the oracle can take the form of a third-party selected by all the relevant parties (human- or computer-based), a source of

reference considered as “trustworthy” – e.g., NASDAQ Stock Exchange - or the service of a decentralized oracle¹ (Polrot, 2017).

Smart contracts open the door of transactions’ true automation, alleviated from the need for clearance from an omniscient and trusted third-party. They program transactions to take place without human interference, further lowering processing time and eventually decreasing their costs. Their application in the field of the sharing economy offers perspectives on automating users’ interactions with the platform. The relative decentralization implemented could further align these platforms with the true concept of sharing by decentralizing the decision-making power and the profits generated among the participants. Eventually, the development of a business model that operates on a blockchain would require drastic changes both inside the *black box* of the platform’s operations and at the level of its utilization by the users. The lack of *best practices* for its design and implementation, coupled with potential resistance and apathy from the market are likely to constitute obstacles in the path toward adoption of the technology.

2.2. Maturity & Adoption

« Many new technologies come with a promise to change the world but the world refuses to cooperate. »

Petroski, 2009.

As we have witnessed recently, Blockchain has been deemed to enable new “decentralized” business models poised to provide a better alternative to the current centralized administration of peer-to-peer collaborative platforms. However, there is a lack of use cases, best practices and even successful applications at the moment. As Gartner pointed out (Walker, 2017), most distributed ledger initiatives are still in their alpha phase, early beta, at best. The use of the Gartner Hype Cycle gives a clear understanding of the technology’s maturity currently stands and how far we are to the actual implementation of viable solutions.

The Gartner Hype Cycle for Emerging Technologies evaluates the maturity of new technologies over time depending on the expectations of the public. It can be examined in exhibit C in the appendices. At the start of any hype, there is an *innovation trigger*, an early

¹ Specialized blockchain structures aiming at gathering the opinion of a mass of users in order to reach a majority decision.

breakthrough of the technology that captures the imagination and gives way to bold promises regarding its future. Media interests and early proof-of-concepts rapidly drive expectations up but, as of now, no field experiment exists to demonstrate applicability. After a period of steeply rising excitement, the technology reaches the *peak of inflated expectations* which overshoots the technological possibilities based on a few success stories while ignoring its numerous failures. After the attempted implementations' failure to deliver comes the *trough of disillusionment*, moment where the reality settles in and expectations drop as fast as they have risen. Most investors retreat except for the projects that have secured sufficient satisfaction from a base of early adopters. Possibilities are then reassessed with caution in light of the admitted hype. The real underlying value of the technology gives rise to a second wave of expectations, but this time, less steep and more conservative, during the *slope of enlightenment*. This is the period where the real understanding of the technology widens and potential paths toward truly reaping its benefits crystallize. Pilots project regarding realistic applications are funded by more risk-averse investors. Eventually, the technology reaches the *plateau of productivity* which sees its mainstream adoption based on developed best practices. The expectations are drawn into people's daily life and the market's relevance of the business built on the technology eventually pays off (Brinker, 2018 ; Walker, 2017).

The Hype Cycle is updated every year and analyzes the state of many emerging technologies such as Virtual Reality, Artificial Intelligence and Blockchain. In 2017, Gartner placed the latter shortly after its tipping point of the peak of *inflated expectations*, estimating 5 to 10 years before its mainstream adoption. After the introduction of Bitcoin to the world in 2008, the public interest sent the technology into its steep rise of expectations which effectively constituted a hype. During that time, everything was Blockchain. Thousands of crypto-currencies were created, some of which appeared to be pure scams aiming at taking advantage of the *fear of missing out* of the market. The value of Bitcoin, the original and leading token, had increased of 1,200 % in just 7 months before the speculative bubble eventually burst. Crypto-currencies flourished, with more than 1,500 coins or token available for trade as of April 2018 and their total market capitalization had reached \$710 billion in January 2018 (CoinMarketCap, n.d.). The trend was not absent from hucksterism either. In 2018, Reuters reported the results of a study showing that existing companies that merely added the word « *Blockchain* » to their name subsequently saw their stock prices rose more than threefold (Pal, 2018). The hype got investors jumping on everything that seemed related to the technology without thinking about the actual possibilities of their implementations. However, as the

Gartner Hype Cycle predicted, crypto-currencies and blockchain projects alike have experienced a loss of trust and excitement as the vast majority of them failed to deliver on those high expectations. Serious blockchain projects such as Ethereum are still in development but they have similarly experienced a loss of support from the market.

Despite this retreat of investment, numerous companies are still experimenting with blockchains. However, Gartner estimates that 85% of these projects will not reach implementation (Panetta, 2018). According to Gartner, very few blockchain companies are “business-ready” to this day. *Permissionless* blockchains remain risky and problematic due to issue of scalability, governance and security threats. Most current projects in the pipeline do not show disruptive features as it is hard for incumbents to go completely out of their traditional legacy (Petty, 2018). It is most likely that the true disruption will come from small-size, risk-taking start-ups combining marketing cleverness, technological expertise and good fortune. These new actors could even beat traditional disrupters to a successful implementation of Blockchain in industries that still rely on middle-men to conduct business.

All things considered, Blockchain is present in people’s mind but the awareness that it has created has been stained by negative coverage and scam stories which hurt the reputation of the technology as a whole. In the list of conditions under which a blockchain peer-to-peer service might reach wide adoption, the individual attitude toward decentralized business models appears to be among the most important ones (Rogers, 2003). In addition, it is equally important to differentiate between securing long-term adoption versus temporary experience from users. Currently, only early adopters – i.e., representing 5 to 20 % of the general audience - appear ready to change their habits and make an educated decision in favor of blockchain services.

Furthermore, characteristics of the business model of a peer-driven platform will have profound influence on its viability. For instance, the pervasiveness of the model - i.e., characteristics of its network effect and the costs of switching habits - may very well decide of its adoption. Rooted in that factor is the usability of the service by consumers. Rather than relying on attributes that match with the users’ beliefs and values such as decentralization, blockchain startups must ensure a sufficient standard for user experience. Additionally, the value proposition put forward by businesses must be concrete and easily understandable. As part of this strategy, based on our analysis of the driver of sharing platforms in section 1 of

chapter 1, we further recognize the importance of focusing on costs reduction and increased convenience for the users, as identified as a key motive of participation in section 1 of chapter 1. As a start, the application of technology in an area where its benefits are actually useful is essential (Tumasjan & Beutel, forthcoming). Start-ups should solely focus on building better solutions, less costly and more convenient than their alternatives, and effectively communicate the additional value to their targeted audience.

Eventually, Gartner's recommendations and additional research provide us with two insights. The first is the premature degree of Blockchain to be offered to the mainstream audience and the second is the objectives and standards that a start-up launching a public blockchain application should set up to ensure its success. As the evolution of the technology is moving forward within small circles of experts, precautions require developers to focus on securing a user-base among early adopters of the technology. Harvard Business Review characterized Blockchain as a *foundational technology*. Compared to traditional disruption which leverages pre-existing technological tools to provide the market with a better solution at lower costs, they argue that this technology will take years before seeping into our economic and social infrastructure and be eventually widely accepted by the market as a viable alternative to the current business models (Iansity & Lakhani, 2017). In other words, Blockchain will slowly be integrated into people's daily lives and expectations and only then, blockchain services could hope to go mainstream on their adoption. An attempt to capture the market at this moment represents a huge risk given the means that would be required and the absence of traction from the market. Instead, blockchain services should move along the adoption line of the whole technology in order to reach the point of wide adoption among a market who is then familiar with the technology and accustomed to its benefits. In line with business thinking, these applications should only focus on areas where real addition of value for the customers is to be uncovered. The period of *happy investments* that characterized the inflation of expectations left investors in search of a serious venture that has a plan about substantiating the benefits of the Blockchain toward users. At last, usability and pervasiveness of such applications must be developed as to ease the switching costs associated with changing consuming habits.

2.3. Trust-free Elements of Blockchain

« *The idea of a perfectly trust-free technology is nothing else than an ideal* ».

Blockchain France, 2016.

The ability of Blockchain systems to create an environment where participants can interact and exchange without the prior need of trusting one another is one of the most appealing promises of this new technology. The Economist coined Blockchain as a “*trust machine*”, negating the need for the implementation of costly mechanisms signalling and conveying trust (The Economist, 2015). However, we know that the concept of trust is extremely complex and its dimensions and constructs ought to be reconsidered according to the specific online environment (Gefen et al., 2008). The claim of a *trust-free* environment established by Blockchain – i.e., an environment which is exempt of the requirement of trust – ought to be nuanced and tested in its different areas of potential applications.

In pursuing that goal, it appears that the understanding of what constitutes trust in online environments and how the technology specifically addresses and interact with this notion remains uncertain and without strong evidence to make its case. As part of the obstacles, Notheisen et al. (2017) pinned down the lack of a common conceptualization of trust between the existing fields of the Sharing Economy and the Blockchain and the need for a common terminology for joint research.

In this paper, our aim is to study the alterations that Blockchain will bring to sharing platforms based on the available literature and field experiences. Falling back on Hawlitschek’s conceptualization introduced above, we distinguish several changes that apply both to the existing targets of trust as well as new ones that make their appearance in the new environment.

2.3.1 Traditional Targets of Trust

The *trust-free* system promised by Blockchain relies on the assumption that the immutable recording of transacted assets enables counterparties without prior basis for trust - i.e., available data, personal history of interactions - to transact with one another without the involvement of a third-party. This role, traditionally endorsed by the platform, is allegedly rendered obsolete in a blockchain environment since there is no need for a central authority to

connect, secure and approve the transactions as cryptographic algorithms endorse that role without the need for human intervention.

It is to be noted that, in the realm of digital services, some middlemen provide far more value than only trust between their participants – e.g., Amazon provides logistics, delivery and recommendations – while others rely on a reputation-based signature of confidence valuable to its users to isolate them from competition (Lundy, 2016). When confronted with the promises of Blockchain, we have trouble to imagine vertically integrated services that offer more than just a validation of identity and a secure means of payment completely disappearing. Regarding Amazon, its role could be downsized to supply chain and marketing efforts, but it would also be naive to think that they do not attach a great value to the control of their platforms and would refrain from distributing it.

However, in situations where platforms only provide for a guarantee of identity and secure means of transaction, their intervention could potentially become largely irrelevant within the architecture of a Blockchain. Looking at it through the lens of trust, it would mean simplified relationships compared to our tripartite structure, resulting in facilitated participation from consumers. What Meijer (2017) has identified as the *disintermediation of trust* is the vanishing of the need for a central organization to establish the correct data as the Blockchain network effectively reaches consensus on the single source of truth valid for everybody among its participants. With no centralizing entity, there is no trust directed toward the platform required from users. However, Avital, Beck, King, Rossi, and Teigland (2016) pointed out that *disintermediation* using IT leads almost always to *reintermediation*, while the holding of the socio-economics power only shifts from one entity to the next. Critics have been calling out alleged sharing, decentralized companies such as Uber and AirBnb that officially claim to operate on pure Peer-to-peer format for effectively using their popularity and dominance to force users to go through their platform to receive and offer services and only marginally empowering its users in the process. Similarly, we hold a critical view on the alleged benefits of decentralization of power using the Blockchain as it is likely that the new actors of this ecosystem will most likely refrain from truly distributing the control on their platform and to retain the decision-making power over their operations. The trend that we are witnessing could very well represent a *reintermediation of trust* in the sense that, while the old trusted agents disappear, new actors take over the control. In our conceptualization, there is still a need of trust toward these new actors. In our sense, building a blockchain venture will always

require retaining some control over the platform's operations. The difference being that, since all the interactions are governed by codes, the party who controls the code controls the platform. By extension, we can very well contemplate the Blockchain itself, the technology and specific implementation, becoming an influent target of trust considering its displayed role of control and responsibility.

Considering the other targets of trust, the literature suggests that the *trust-free* environment is built on the technological features of the Blockchain and that it is therefore constrained within the boundaries of its technical ecosystem (Notheisen et al., 2018). While digital assets can be moved directly on the blockchain, the transfer of physical assets still requires the intervention of an enforcing mechanism. Conceptually speaking, the need for trust remains present beyond the area controlled by the Blockchain to effectively translate transactional information encrypted in the blocks into the real world. In his paper, Glaser (2017) argues that the Blockchain could provide the infrastructure to decentralize all intermediary services because of the high level of closeness of peer-to-peer market ecosystems. In our sense however, we consider most peer-to-peer platforms as the intercorrelation of different ecosystems that cannot be constrained inside a fully closed ecosystem solely relying on information generated within its own boundaries (Notheisen et al., 2018). While some opportunistic behaviors are prevented by cryptographic mechanisms in the algorithm, the need for *trust in peer* is still very present when the actions take place outside of the blockchain. At some point, Uber drivers will still have to physically pick up the hailing passenger, the same way that sellers on Ebay will still have to mail their products and that Airbnb lessees will still have to collect the keys of their rentals. Outside of the exchange platform, actions of agents remain unbounded by creativity until these actions can effectively be controlled and restrained through their inclusion in the algorithmic ecosystem. Similarly, the trust in product remains relevant until their integration in the blockchain ecosystem in order to give participants the ability to measure its fitness to perform the task required. In the future, we reckon that some platforms could see the development of a fully integrated ecosystem based solely on the Blockchain through the leverage of IoT and A.I. but it remains a long journey for them and only automatable services would be directly concerned.

2.3.2 New Targets of Trust

We have stated several times in this paper that the concept of trust is evasive and requires be reconsidered in light of the specific environment in question. There is no question that a new

blockchain ecosystem introduces new elements to take into account when looking at it through the lens of trust. To a certain extent, the current trust in the platform as it was defined in the 3P model becomes obsolete. By design, a decentralized peer-to-peer marketplace would effectively run on its own after being launched and its operations would be controlled by its codes. This negates the involvement of a operational regulator usually represented by the company of the platform. However, we have hinted at a redefined role for the *platform*. As mentioned earlier, we expect that the company would probably retain part of its power. Therefore, it would still require to prove itself trustworthy in the eyes of its potential customers. Instead of a reduction of the need for trust in the altered ecosystem, we rather conceive a shift of trust toward redefined and new emerging targets. Based on a review of the literature, we have identified these targets of trust potentially relevant in a blockchain environment.

New target 1: the platform, redefined.

In a decentralized marketplace, the software takes on a very significant role as it serves (i) as the regulating architecture that supports transactions and (ii) as the primary representant of the marketplace itself. Above the technology's reliability and its beneficiaries stands the programmed code of the system and by extension, its authors. It was already pointed out that, from a business perspective, the authors of the code would be the organization behind the platform. In addition, it is likely that, while some degree of decentralization can occur in the decision-making over the constitution of the code, the ultimate decision would likely remain in the hands of this organization. However, it would have to delegate most of its control over day-to-day operations to the software.

These softwares can be thought as « *expectations of what will turn up in the everyday world* » (Thrift, 2005, p. 154). Indeed, due to its predictive power, it reduces the uncertainty that emerges from interacting with another entity. Theoretically, nobody is supposed to control the decisions of decentralized softwares such as a blockchain. Ultimately, the algorithm can be perceived as *trustworthy* in the sense that it cannot be influenced because its actions are scripted in the code and can therefore not be partial on a case-per-case basis. In other words, the use of a machine-based regulator reduces the freedom of actions of individuals who are all treated the same way depending on the rules of the software.

But Thrift (2005) further argues that, while the resulting outcomes of the software are tangible, the relationships between the input data and the technical mechanisms are largely invisible, creating a space of *technological unconsciousness* (Meijer, 2017). While trust in the software can be built through repeated and consistent interactions, its users remain vulnerable to its invisible effects as well as the potential alterations of its code. Eventually, we fall back on the power of the company in charge of designing these algorithms. As responsible for them, they are the ones that ultimately need to be trusted with their project and their effects. In addition, the rules that define the alteration of a platform's software must be carefully reviewed in order to fully grasp the control wielded by the platform. If needed, an extra-layer of regulatory codes must be added to safeguard the users' interests.

To illustrate our previous point, we turn to the existing literature. While the body of research on the subject is small, Maurer, Nelms, and Swartz (2013) have conducted a survey among Bitcoin users showing that they place their trust in the e-currency code instead of central authority to produce and distribute the currency. At the source of this trust is the transparency of the system, which allows users to “*review, effectively evaluate, and agree as a group to changes to it*” (Lustig & Nardi, 2015, p. 3). In line with these findings, Lustig & Nardi (2015) have analysed the perception of trustworthiness of *algorithmic authority* in the context of the Bitcoin protocol and eventually found out that the reasons behind user participation are their feeling of empowerment in the management process of the currency. In that specific case, product and creators go hand-in-hand as users feel involved into the designing process of the software. It seems that involving users in algorithmic design would have a positive effect on consumers' attitude toward the platform.

This involvement is taken to the extreme in the Bitcoin protocol as it is *open-source*¹. On the other hand, we have assumed that it would be in a company's best interests to preserve some control over their algorithms that constitute their platform. However, some hybrid solutions, half-way between Bitcoin decentralization and traditional centralization, are conceivable to increase positive attitudes from users while retaining some decision-making powers.

¹ Open-source means following a set of rules established by the *Open Source Initiative* that puts a code to the disposal of the public and that is usually the result of a collaboration between programmers.

In short, we have identified the trust targeted to the *platform* as including the software itself as well as the company behind its design. However, we maintain doubts over the suitability of the dual nature of this target for our model. Based on the obtained results, it may be judged that these two elements are better studied separately. Nevertheless, given the originality of our research, we decided to maintain this aggregation until its relevance had been demonstrated or debunked.

New target 2: the miners.

As explained previously, blockchain's network decides on the state of the ledger – i.e., the unique truth valid for everybody – through the use of consensus algorithms. These algorithms are at the centre of the architecture of the technology and open the door to innovative forms of business models through their applications.

Currently, several consensus algorithms exist. Based on the selected protocol, power is distributed among certain users, which get the right to prioritize, select and write the new transactions on the chain. Only when the information is written on the chain is the transactions considered as processed. Despite the claim of decentralized control, it effectively remains within the hands of these users that we call the *miners*.

In theory, every node can become a *miner*. However, in certain blockchains called *private blockchains*, being a *miner* is reserved to preselected nodes only. However, in our opinion, the true innovative potential of the technology is only exploited when the blockchain is made *public* – i.e., allowing every user to become a *miner* and process transactions. Despite the decentralization of this power, *miners* remain an influencing actor of a blockchain ecosystem. Our model would be incomplete without its integration as a new target of trust.

New target 3: the oracles.

The introduction of smart contracts to a blockchain can be very useful to automate tasks and decentralize the operational power. However, we have seen these are limited to interact with elements present within the architecture of the blockchain. Most of the time, transactions require the input of outside information whether it is from a connected device, an external databank or even a human agent. The need to transcribe information from outside the

Blockchain sphere of influence into its ecosystem to trigger the execution of smart contracts lead to the implementation of *oracles*.

In its broad definition, an *oracle* is a trusted data feed that sends information into a blockchain, compensating for the incapacity of smart contracts to directly access this information outside of their sphere of action. The services of *oracles* are usually supplied by special third parties that are authorized by the algorithm to access the blockchain through a node and write information within blocks (Slobodnik, 2018). Indeed, the necessity to rely external agents call into question the actual *disintermediation* dear to the Blockchain technology. Nevertheless, these third-parties are granted a limited amount of power for a certain role, reducing the risks associated with their recourse.

Oracles can be human- or computer-based, but need to be validated by the concerned parties in order to legitimize their actions in the eyes of the consumers. Within a peer-to-peer platform environment, an example of *oracle* can be a sensor detecting the entry of a passenger in a ride-sharing car, triggering the smart contract that proceeds to a transfer of money. It can also be the hailer itself confirming its entry in the vehicle. Depending on the technology available to entrepreneurs, they need to choose the most reliable form of *oracle* in order to reduce the risks of fraud and increase the usability of smart contracts.

Given their importance within a blockchain environment, *oracles* need to be identified by the users so that they can assess their trustworthiness. We assume that the trust perceived from this target will influence *intention to consume* and hold a relevant place in our modelization of trust.

Additional element: the Blockchain technology.

Additionally, we have approached in the previous section the adoption of blockchain applications as depending on the maturity of their underlying technology. Any technology adoption needs to be taken into account when contemplating the intention of users to use applications that have been built on this technology. On that note, Roger (2003) has argued that the attitude of a consumer toward a technology determines a large portion of their willingness to use it.

This general willingness to use a technology depends on the mixed emotions and beliefs that an individual holds true about this technology. Following this paper terminology, we would identify *trust in Blockchain technology* as a key determinant of the ultimate *intention to consume*. Many assumptions can be made over what drives this trust: the technical knowledge, the perceived reputation, the example set by close peers, etc.

Despite its influence, we have decided not to include it as a target of trust in our model for two reasons. First, we did not cover the relevant theory that would have enabled us to integrate the technology itself to our framework and makes it coexist with the other targets. Assessing the influence of the technology's maturity is likely to be a significant task that may require its own study. Secondly, we also believe that the introduction of the actors of the blockchain presented earlier cover to a certain extent the concept of *trust in Blockchain technology*.

The identification of the features of the blockchain and its foreseen development toward a mature, deployable technology has provided many insights on its potential applications in a peer-to-peer environment. However, the case remains uncertain as to how the environment will eventually redefine the notions related to trust. This section has led to present some hints of this redefinition and new targets of trust that are likely to play a role in the users' eventual intentions of participation.

3. Conceptualization of Trust in Blockchain Peer-to-Peer Marketplaces

In the previous chapter, we have begun to crystallize the joint study of the two fields of research of this paper by looking at a blockchain ecosystem through the lens of trust. In this chapter, we will further bridge the two subjects by presenting the business model of a hypothetical platform built on the Blockchain in the field of the sharing economy. By the end of it, we will have drawn hypothesis on the influence of the identified dimensions of trust on the participation intentions to this imaginary platform.

3.1. Accommodation-sharing Application: Presentation of the Business Model

« Undoubtedly, its best applications [of Blockchain] are yet to come. »

Tapscott & Tapscott, 2016, p. 2016

In order to properly gauge the validity of our theoretical conceptualization and assess the readiness of the market to use blockchain sharing services, we develop in this section the business model of a specific blockchain, peer-to-peer, accommodation-sharing application. Subsequently in this paper, this application will be used to provide a base for the conduction of our survey.

The number of ICO's – i.e., Initial Coin Offering, the primary sales of tokens powering a decentralized platform - in the field of the sharing economy has been growing by the day. However, many of these applications were short-lived either due to unsuccessful adoption or because they were essentially a scamming scheme aiming at benefitting from the hype around the crypto-technology.

Because we are in the early stages of development of this technology, business models relying on it to remain fragile. Theoretically, some applications displayed a viable structure but lacked traction from the market to reach their plateau of productivity. Because of the decreasing hype, investors have been exiting their investments in projects that have failed to demonstrate promising results. As an innovative technology, Blockchain remains esoteric to most people, probably impacted by the market's understandable skepticism following the recent negative coverage from the media. Instead of seeking wide adoption from the start, which appears to be compromised by many adoption obstacles, an alternate solution for blockchain companies could be to develop a user-base among savvy Blockchain amateurs. The objective would be to effectively become a service of niche, targeting only a portion of the market before the technology gains momentum and starts reaching the masses. Only then could a viable company be in a prime position to expand and offer its services to a larger audience.

We have also pointed out that the value proposition should focus on offering tangible additional value compared to existing substitute services. Using only the technology for the

sake of including Blockchain would not result in sustainable interest and adoption from the market. Instead, we have focused on increasing the convenience of existing alternatives – i.e., creating a system where users feel that they have more control over their operations on the platform – and decreasing the costs incurred by users – i.e., drastically diminishing the fees perceived by the platform. That way, we are consistent with the insights given in section 2 of chapter 1 that the primary drivers behind sharing platform are economic and convenience motives.

Taking these insights into account, we have developed a theoretical business model, called *BlockBnb*, based on existing models that may or may not still be currently active. We have found inspiration from relatively successful examples as well as interesting ideas that failed to be incorporated in an appealing way in a model. While the core activities are drawn from the Airbnb platform, the decentralized specificities are inspired by blockchain platforms such as BeeNest, Decred and Ethereum. Smart contracts are integrated in the arbitration process in order to test the relevance of *oracles* dimensions of our framework.

As its name indicates, *BlockBnb* is derived from the business model established by Airbnb. Since it is built on a Blockchain, adjustments had to be made in order to unlock the additional value of the technology. Many of the features included in BlockBnb are derived from BeeNest's white paper (BeeNest, 2018). BeeNest is a real decentralized platform for peer-to-peer accommodation-sharing currently in its development phase. In addition, Decred offered an interesting design for the sharing of power between the company and its users that was incorporated in BlockBnb's business model. The platform is built on the Ethereum network, which allows for the easy implementation of Smart Contract and gives access to their ecosystem involving the other applications of the network.

BlockBnb is a user-centric application active in the peer-to-peer, short-term, accommodation rental sector. Its value proposition is to provide individuals with a medium to rent private accommodations at a lower fee than the incumbents' while decentralizing operational and strategical decision power among the users. The platform's operations are transparent and secured within its Blockchain architecture.

Under the hood, the platform is organized as a traditional Blockchain with blocks, mining nodes and smart contracts. The *miners* are in charge of maintaining the network and

processing the transactions. As consensus mechanisms, BlockBnb utilizes the *Proof-of-Stake* (hereinafter, « PoS ») implemented on the Ethereum platform. Instead of relying on computing power as in *Proof-of-Work*, PoS dictates that the writer of the next block is chosen in a deterministic manner based on the *stake* of the miners – i.e., the number of the platform's token that a node holds. PoS has been implemented as a greener alternative to avoid the unnecessary destruction of raw resources. It also aligns miners' interests with the ones of the network as the value of the assets of the miners is dependent on the health of the platform. This mechanism incentivizes miners to act for the benefit of the whole network. However, the system presents its own flaws which the Ethereum's team of developers is trying to patch. As a client of the Ethereum platform, BlockBnb is dependent for its features and its choices are limited. Any users can become a *miner* by simply downloading a program on their computer.

As mentioned in the previous section, BlockBnb will refrain from fully decentralizing the control of its platform in order to conserve a say in the strategic course and development of its operations. The development of the platform's code will be done in-house and released to the public at the launching date. The subsequent developments of the code will include the possibility for users to submit feedback and advice but the ultimate implementation will be, again, done by BlockBnb's developers. As pointed out in section 2 of chapter 2, it is important that users feel empowered and involved in the decision-making process. The decentralization of power will be implemented via the ultimate validation process of any change made to the code. Miners will be able to vote on the proposed alterations of the code and the changes will be implemented after reaching a majority of approval.

The transactions on the platform will primarily use BlockToken, the proprietary token of BlockBnb. This token is available for sales from BlockBnb at a predefined rate in exchange for fiat currencies¹ or major cryptocurrencies – e.g., Bitcoin and Ethereum. However, we have also seen in section 2 of chapter 2 that the pervasiveness of the model influences its adoption as it decreases the costs of switching services. This is why we have included the option to pay with fiat currencies. However, the fees associated with these transactions will be increased to 3% while those using BlockToken will not be charged at all by the company.

¹ Fiat currencies are the types of currency used backed by central institutions such as the Dollar, the Euro, etc.

Storage on the Blockchain implies that all the information – e.g., transaction details history, user data, software modifications, etc. – is available for any user to read by accessing the database. Full transparency enables to set up a reliable and immutable user's reputation system. The identity of the users will be verified at the signing on the platform, in accordance with Know-Your-Customer regulations. The reputation score of users will be calculated taking into account past renting experiences, seniority and special contributions – e.g., mining and arbitrage.

On the user-interaction level, the interface of the platform will be similar to Airbnb's. Potential guests can consult a list of available accommodations with their booking price and the host's profile according to their preferences (location, price, period of stay and type of accommodation). Similarly, potential hosts can set the price for the booking of their accommodation, display pictures and additional information about their accommodations, have control over the booking and have access to the profile of their guests.

Once a booking is made, the software verifies that the amount required is present on the guest's account. When the host accepts the booking, the amount of the transaction plus a guarantee deposit are transferred from the guest's account to a blocked account, not accessible by any party. Cancellation is possible within 24 hours before the stay. After this limit, part of the deposit will be transferred to the host's account for compensation. Similar penalties will be implemented to limit similar misconducts from the host.

The stay completed, the guest and the host validate each other's good conduct on the platform. The payment for the booking is automatically transferred from the blocked account to the host's account while the guarantee deposit is transferred back to the guest. In the case of a dispute between the parties – e.g., false claims about the accommodation, damage to the property -, they can resort to the arbitration system of BlockBnb. The arbitration process is a set of smart contracts embedded in the algorithm. Both parties must stake the amount in dispute in a block account called the *arbitration pool*. Thereafter, they make their case and present their argument to a group of five arbitrators that are randomly selected by the algorithm among a list of volunteers. The argumentations are presented anonymously to the five arbitrators who review the information and make a judgement about the case. The decision about the party at fault and the extent of their responsibility for the fault is expressed through a complementary-percentage scale – e.g., 100/0, 75/25 and so forth. Each decision is

made by the judge individually and anonymously. The median of the judgment decides of the allocation of the arbitration amount among the parties. In this particular case, arbitrators act as oracles, whose inputs trigger the smart contract of the arbitration amount allocation.

In order to limit disputes and avoid frivolous appeals, the resort to the arbitration system will weight negatively on the user's reputation. Additionally, a fee from the arbitration amount will be perceived to remunerate the arbitrators if they have conducted their task in time. Any user can become an arbitrator by subscribing to the program, but must also follow a strict code of conduct. They need to transfer BlockToken as stakes in the arbitration pool for any judgement that they agree to hear and they lose this stake if the judgement is not delivered on time and in accordance to the rules.

Because it is a preliminary and untested model, some adjustments will need to be made following its first application in our survey. In particular, the arbitration and the reputation systems would likely require some improvements based on the feedback of its first users. Nevertheless, this quick presentation reviewed the principal components of the system and provides enough information to establish a descriptive scenario for our subsequent questionnaire.

3.2. Research Model & Hypotheses

« *Guessing before demonstrating.* »

Pointcarré, 1911, p. 153.

The identification and justifications of the targets of trust in our model presented in section 3 of chapter 2 were applied to the specific business of BlockBnb. The development of our hypotheses on the influence of trust is derived from the 3P model and the work of Hawlitshek, Teubner & Weinhardt (2016).

While the existing agents of *peer* and *product* remain relevant in the context of Blockchain, we have explained the expansion of the role of the *platform* as a combination of the code and its authors. Additionally, the new targets of *miners* and *oracles* (represented in our situational example by the *arbitrators*) appeared relevant to further break down the concept of trust within a decentralized marketplace. Each of these new actors' trustworthiness could be further

broken down into the three components of *ability*, *integrity* and *benevolence* as they are all capable of action, will and intention.

3.2.1 Obtainer's Perspective

First, *trust in peer* emerges from the provider's ability and competences to carry out their part of the transaction and whether they are acting with integrity and benevolence. The integrity of the provider is related to whether it is perceived that they keep their word and act with honesty. On the other hand, benevolence refers to the fact that they keep the obtainer's interest above their own – e.g., adapting their service to unforeseen events. Both dimensions are of particular importance in a decentralized peer-to-peer accommodation-sharing environment. The first reason is that the provider will most likely be a private individual rather than a legal entity. Consumer protection within decentralized marketplaces is yet to exist and provides no guarantee to receive legal compensation in case of fraud or misarrangement. The second reason is that the dependence of the obtainer toward the provider. In most cases, they are more dependent on the supplying of the service than their providing counterpart, especially for on-demand services such as transportation and accommodation. Indeed, nobody wants to be left at midnight wandering in an unknown city if the taxi driver does not show up or realizing that the booked apartment does not exist (Hawlitschek, Teubner, & Weinhardt, 2016).

Hypothesis 1: trust in providing peer positively influences intention to obtain.

Second, *trust in platform* is assumed to impact the willingness to obtain as it is targeted toward algorithms that govern all interactions taking place on the platform. As explained in section 3 of chapter 2, the dimensions of *ability*, *integrity* and *benevolence* of the algorithms are extended to its human-origin, hence the company. The perceived capacity of the software to match, connect and enable transactions in a transparent and secure manner can be extended to the ability of the company to provide the software with this capability. This belief constitutes the trust in the platform's *ability* from an obtainer's perspective. Similarly, due to the human-origin of the platform, the *integrity* and *benevolence* are relevant to characterize respectively the honesty and the goodwill of the developers – e.g., are they transparent about what their software does? Do they have users' interest at heart? Is this attitude reflected in the algorithms and their updates?

Hypothesis 2: trust in platform positively influences intention to obtain.

Third, *trust in product* is viewed as the reliability of the service requested. As defined by Comer, Plank, Reid, and Pullins (1999), it is « *the belief that the product/service will fulfill its functions as understood by the buyer* » (p. 62). The accommodations that available for renting in a decentralized peer-to-peer marketplace are mostly assessable digitally for the obtainer and little data other than those presented by the provider and their past renters is made available to them. Based on the argumentation of Gefen et al. (2008), we argue that trust in a product is closely related to past experiences with the same platform and potentially past experiences with comparable platforms – i.e., in the case of BlockBnb, the past experiences with AirBnb. As an inanimate object, it is not attributed nor will nor intention, rendering the dimensions of *integrity* and *benevolence* irrelevant in that case.

Hypothesis 3: trust in product positively influences intention to obtain.

Fourth, *trust in miners* is seen as the intrinsic ability of the nodes of the network to process transactions and log them into the blockchain in a timely manner. The control of these nodes on the state of the database may imply the need for a high degree of trust depending on the mitigating mechanisms present in the codes. Their *integrity* supposes the professional and honest respect of the rules established in the tacit contract between miners and the rest of the platform. We believe that confusion may arise when it comes to the *benevolence* dimension as the algorithms typically do not leave room for unscripted actions. In some cases, the belief that miners will place the interest of the whole network, not only the obtainers', above their own can be relevant and a good approximation of the goodwill expressed by the miners.

Hypothesis 4: trust in miners positively influences intention to obtain.

At last, *trust in oracles* is relevant when smart contracts are in use. When it is the case, the importance of the roles played by the *oracles* has been explained in this paper. In the case of BlockBnb, we have materialized the *oracles* in the *arbitrators*, that need to provide the *arbitration smart contract* with the data of their verdict. The *ability* of an *arbitrator* depends on the beliefs in its capacity to judge the cases and provide a sound decision in a timely manner. As human-based oracles, the dimensions of *integrity* and *benevolence* become relevant to assess their trustworthiness. Its perceived commitment to diligently act as expected is central to the apprehension of the obtainer toward the BlockBnb and its services. Similarly to the *benevolence* of *miners*, *arbitrators* have a duty to act impartially. Therefore, their

benevolence can be seen as their disposition to act by keeping all users' interests in high regard.

Hypothesis 5: trust in arbitrators positively influences intention to obtain.

3.2.2 Provider's Perspective

First, peer-to-peer platforms work on the basis of mutual agreement to trigger a transaction (Hawlitschek, Teubner, & Weinhardt, 2016). The willingness of participation from a provider's perspective is therefore of importance as well. The concern of providers about potential damage caused to their assets is a direct barrier to sharing (Weber, 2014). Entrusting a stranger with their belongings requires a certain level of trust in the *ability* of that stranger to properly maintain the physical integrity of these belongings. Similarly, the dimensions of *integrity* and *benevolence* influence the level of assurance given to the provider that their possessions or themselves will not be abused.

Hypothesis 6 : trust in obtaining peer positively influences intention to provide.

Second and similarly to the obtainer's perspective, the provider's cognitive perceptions about the code and the developers affect their willingness to supply. Compared to traditional peer-to-peer platforms, decentralized marketplaces are said to be *fairer* in their redistribution of wealth. The prime reason being the origin of these platforms: they are for the most part built by a community of future users and apply more of the *sharing* principles as implied by Botsman (2015). Nevertheless, the trust in the *ability* of the algorithm to effectively match, connect and execute transactions, coupled with the trust in the *integrity* and *benevolence* of the developers at the source of this algorithm, still play a big role in their ultimate intention to participate. Transparent processing, profit- and control-sharing within the software can increase the amount of trustworthiness perceived by suppliers. As Lu et al. (2010) suggested that trust in the platform influences the supplier's intention to participate, we argue that their algorithmic extension does the same.

Hypothesis 7 : trust in platform positively influences intention to provide.

Third, Blockchain technology is said to provide a solution for the management of double-spending issues. One instance remains problematic when the time needed to process a transaction is long enough to allow obtainers to pay for different services using the same money. For the sake of example, let us assume that a user of a decentralized eBay is buying a

product from a seller with the platform tokens. If they act swiftly, they may be able to use the same tokens to make another purchase before the first transaction is processed by the miners of the network. The trust that providers place in the *miners' ability* to process the transactions in a secure and timely manner may impact their willingness to take the risk to transact on the platform. Their perceived *integrity* and *benevolence* act in the same way as from the obtainer's perspective. Being perceived as fair and honest in the processing of the transactions and taking the interests of the network and its users into account constitute key drivers from a provider's perspective.

Hypothesis 8 : trust in miners positively influences intention to provide.

Finally, *oracles* – i.e., *arbitrators* – take on the role of third-party intermediary in case of conflict between peers. In a way similar to the obtainers' perspective, the belief that *arbitrators* have the ability to judge cases in a competent and timely manner, coupled with their perceived *integrity* and *benevolence*, play a significant role in the provider's attitude toward participating.

Hypothesis 9 : Trust in arbitrators positively influences intention to provide.

The summary of the hypotheses can be found on the visualisation of trust presented below.

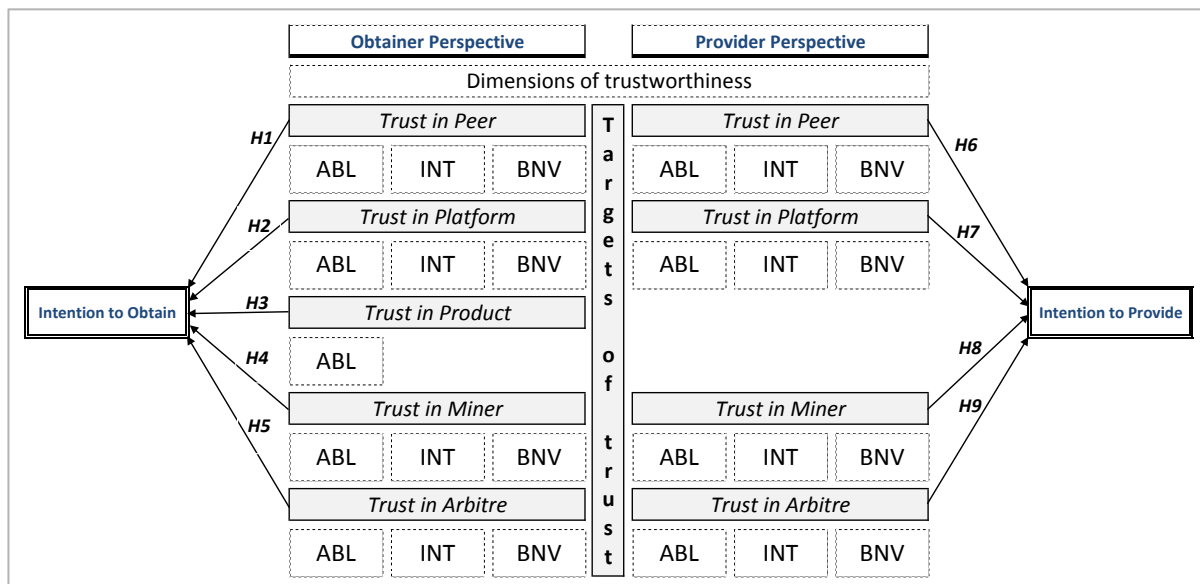


Figure 1: Research model of trust within blockchain peer-to-peer marketplaces applied to BlockBnb.

(ABL= Ability; INT= Integrity; BNV= Benevolence).

The application of our theory-based understandings of trust and Blockchain has led us to develop a conceptualization of the former in an environment built on the latter. We have applied this modelization to our example of BlockBnb and drawn hypotheses for the influence of the components of trust on the intentions of users to use BlockBnb. We will now turn to a research on the field to attempt to confirm our hypotheses.

C. Practical Part

In the previous part, we have conducted several literature reviews to refine our understanding of the concepts treated in this paper. Now that we have developed a research model of trust in decentralized sharing environments and applied it to our self-developed BlockBnb business model, we need to confront our hypotheses with the reality of users' perceptions in order to properly address the research question of this paper.

In this part, we present the methodology that we used to construct a questionnaire aiming at assessing the attitudes of people toward BlockBnb and their perceived trust toward the different actors of its ecosystem. First, we explain the method used to break down our theoretical concepts into practical questions. Then, we present how we have administered the survey to its participants. The data that have been collected are then analysed through statistical models to evaluate people's responses on their potential use of Blockchain, link these intentions with their degree of trust toward the targets, and test empirically the validity of our research model.

1. Methodology Used

1.1. Conduction of the Survey

« The art and science of asking questions is the source of all knowledge. »

Berger, as cited in Grandhi, 2018.

The collection of raw data from the public is essential to substantiate our assessments and validate or disprove our hypotheses. The most challenging part of conducting this survey was to translate the abstract constructs into practical items to be evaluated by the respondents. To that end, we applied the theory *scale development* to create our questionnaire, and we conducted the survey through relays on social media in an attempt to capture the largest sample possible.

This section presents the methodology used to prepare, build and conduct the survey. It highlights the choices made – choices that will eventually introduce some bias in our results - but it also provides justifications for these choices.

1.1.1 Design of the Questionnaire

As mentioned in the introduction of this section, one of the main issues of the creation of the questionnaire was to correctly measure non-directly observable concepts such as perceived *ability*, *integrity* or *benevolence*. The literature on *scale development* (Hinkin, 1998; Tay & Jebb, 2017) provided guidelines and best practices on how to develop *proxy* items to indirectly measure abstract concepts.

Considering our 27 constructs in total, the number of proxy items developed for each construct was an important issue. On the one hand, overitemization – i.e., too many items compared to what is necessary – may introduce some bias in the answers due to participants' fatigue or boredom and the redundancy of the questionnaire. On the other hand, underitemization – i.e., too few items – would fail to correctly evaluate the complexity of the underlying construct. Eventually, we relied on the conclusions of Cook, Hepworth, Wall, and Warr (1981) which state that internal consistency within items of the same construct can be achieved when starting from three items. Our choice was partly driven by concerns about the feasibility of the survey given that it would eventually determine the quality of our results.

The literature on the subject guided us toward constructing a questionnaire that assessed the items by stating some affirmations about the characteristics of a target and measuring the attitudes of agreement of the participant with that affirmation. As prescribed by Hinkin (1998), the affirmations were formulated in a simple and concise way by using that a common language that would be easily understood by the majority of the participants. In addition, we were careful to have each item addressing one single subject – e.g., « *The host is experimented* » to assess the perceived experience of the provider. However, in some cases, the subject was more clearly communicated using the combination of two terms to clarify the meaning of the statement and to mitigate potential unconventional interpretation of a word – e.g., « *The host is reliable and serious* » to assess the professional attitude of the provider.

Following these recommendations, each dimension of trust (*ability*, *integrity* and *benevolence*) was assessed through three complementary items adapted to the situation of each target (*peer*, *platform*, *product*, *miners*, *arbitrators*). Furthermore, being consistent with our theoretical modelization, we have created two separate sets of questions to clearly differentiate between the obtainer's and the provider's perspective. Whenever available, we

have adapted our items from existing and tested *scales* (Hawlitschek, Teubner, & Weinhardt, 2016). However, the introduction of new constructs into our research model required us to create our own scales based on our background.

Provisionally, 75 items were developed to assess 27 constructs: 39 for the obtainer and 36 for the provider. In addition, the *intentions to participate* were also assessed through three items for each perspective, raising their total number to 81. The list of the items can be found in exhibits D.1 and D.2 of the appendices.

To guarantee the usability of our results, it was important for the survey to produce sufficient variance among the answers. Therefore, participants were required to react to the series of statements using a *7-point Likert scale* ranging from “*Strongly disagree*” to “*Strongly agree*”, with a possibility to remain neutral with a “*No opinion*” option. However, because of the importance of this decision in reality - i.e., effectively intending to participate or not – and to be able to draw statistical significance from the results, the answers to the items referring to the *intentions to participate* were presented using a *6-point Likert scale* with no possibility to abstain.

After the development of the scales, we tested the validity of the content as advised by Hinkin (1998). To that end, we established a list of all the items regrouped into one page with the definition of a measured construct on the top. All the constructs were covered through three qualitative interviews where respondents were required to evaluate the extent to which each item conformed with the definition of the construct. The results and the following discussions highlighted some paths to improve the appropriateness of the items. For example, a prior item – i.e., « *The host is qualified* » - did not characterize enough their *ability* in the minds of the respondents, as it referred to a *professional* experience while our situation involved hosts that were renting as *amateurs*. Although we acknowledge that this technique does not guarantee the complete validity of our content, it still provides some assurance of the adequacy of its use for the approximation of our constructs.

1.1.2 Administration of the Survey

The survey was carried out only with the use of SurveyMonkey, a well-known survey management tool. Around 350 people were directly contacted by the author and his direct social circle to participate. In addition several others were reached through general

publications and relays in social media networks such as Facebook. The recipients were informed that the survey was open for participation for one week starting from Sunday 15th of July 2018 at 01:00 PM and ending on Sunday 22nd of July 2018 at 10:00 PM. No prerequisite was needed to take the survey and volunteers from all backgrounds were eligible to respond. Moreover, participants were informed that the completion of the survey required from 15 to 20 minutes and that it needed to be done in one sitting. To avoid the falsification of the data, the software did not let participants complete the survey more than once.

The participation was voluntary although incentivized by organization of a price draw among the respondents which rewarded two “*Bongos*” valued at 25 euros each in order to boost interest and ensure a sufficient level of participation. For practical reasons, the participants had the opportunity to enter their email address at the end of the questionnaire to participate to the raffle but they were also informed that it would not be matched with their answers to the questionnaire in order to respect the anonymity of the survey. During the running of the survey, changes were made only once in its first hours to add a warning so that participants would make sure to complete the survey thoroughly. This precision was added after having witnessed that some people were only completing the first page. This addendum had no impact on the answers in progression or already submitted.

The final questionnaire that was sent out contained six parts, which can be found in the series of exhibits E in the appendices.

- *Part one* (exhibit E.1) provides participants with the context and the structure of the survey. In it, we explain the objectives and the scope of the research and inform participants about what to expect and in which conditions to complete the survey.
- *Part two* (exhibit E.2) presents the functioning of BlockBnb in simple and practical terms. Tangible proprieties and implications of the Blockchain technology are also explained all along the presentation.
- *Part three* and *part four* (exhibit E.3 & E.4) comprise the statements related to the constructed items respectively seen from the guest’s and the host’s perspectives. Each perspective is separated into its own block. Each block is presented with a reminder to participants to project themselves into the situational example and with instructions on

how to respond to the affirmations by choosing among various degrees of (dis)approval. They are asked to react intuitively, based on the description of the platform in part two but also based on their personal mental representation of the situation. Part two is deliberately general and brief in its description in order to let the personal nature, experiences and attitudes of the participants fill the blanks and to capture the full variance in people's perceptions. They are informed that there are no right nor wrong answers, and that bias based on personal interpretation is more than welcome. To facilitate the completion of the questionnaire, the explanatory test of part two is available at the end of each page.

The list of items presented in both blocks follows the same sequence in all versions of the questionnaire: *intention to participate*, *peer*, *platform*, *product* (only for the obtainer's perspective), *miners* and *arbitrators*. Within each target, the order of the dimensions is: *ability*, *integrity* and *benevolence* (except for the *product* target that is only composed of *ability* given the aforementioned reasons). This repeated logical structure may introduce some bias in the results, especially considering the length of the survey. However, our qualitative interviews for the content validation suggested that projecting oneself in a hypothetical situation on whether participating or not in a not-yet existing platform was already difficult enough for participants. As a result, we did not want to negate the validity of the results by further confusing the respondents and eventually discouraging them. We deliberately put the *intention to participate* items at the beginning of each block in order to capture the participants' intuitive attitudes before going into the deconstruction of their primary reaction into the hypothesized constructs. It also serves as a reminder of the final objective of the research.

- *Part five* (exhibit E.5) queries additional information about the participant in order to put the results in perspective and refine the findings. The requested variables were the following: gender, age category, country of residence, self-assessed risk propensity, prior experience with AirBnb both as a guest and a host, degree of awareness of the Blockchain technology and prior usage of a blockchain application. We included *risk propensity* in order to account for the *propensity to trust* of a trustor as identified by Mayer et al. (1995) and mentioned in the third section of the first chapter of the Theoretical Background. Similarly, the findings of John (2013) guided us toward accounting for past experiences in similar platforms as well.

- Finally, *part six* (exhibit E.6) offers participants the opportunity to participate in our prize draw and provide their email address. It also thanks them for their time and their valuable contribution.

1.1.3 Participation Results

Out of the 350 people directly mobilized, 181 people started the survey, out of which 168 completed it thoroughly. From the observations that were retained, 75 of them were men and 93 women. The most represented age categories were [50–65] and [18–25] with 47 participants each, followed by [35–50] (36), [25–35] (31), [65+] (6) and [12–18] (1). All participants indicated that they resided in Belgium.

Although the literature has not reached consensus on the minimum number of respondents required, some researchers have suggested that a sample size of 150 observations would be sufficient to ensure the accuracy of the solutions found through our subsequent exploratory factor analysis (Guadagnoli & Velicer, 1988). There is no doubt that collecting more observations positively influences the validity of their statistical analysis. Indeed, scaling up the participation would ensure that smaller differences would be noticeable as more than mere sampling fluctuations, especially given the length of the questionnaire. However, considering the means available during the administration of the survey, we had set our primary objectives of participation to 100 which seemed to be an acceptable amount.

1.2. Data Treatment

« *All models are wrong, but some are useful.* »

Box, 1979, p. 3.

After collecting our data, we conducted an *exploratory factor analysis* in order to validate the itemization of our abstract constructs. The results of the analysis extracted the underlying factors of our survey's responses. Thereafter, we used these factors in a *multiple linear regression* to assess their correlation with the *intention to consume* of participants. All curation of data was made using Excel and the statistical analysis were conducted using R. Exploratory Factor Analysis.

A list of all constructs and their corresponding items are displayed in exhibits D.1 and D.2 of the appendices. These tables display the items used to measure each construct as well as their

reference for internal use, their descriptive statistics (means and standard deviations) and the *Cronbach Alpha* associated with each construct. The *Cronbach Alpha* measures the internal consistency of a set of items of the same construct. All computed alphas exceeded the threshold of 0.7, which is fixed by the literature as the lower bound to validate the reliability of the research model (Gliem & Gliem, 2003). We can therefore assume that the majority of participants interpreted all items as part of the same construct as intended.

Before going any further, we assessed the suitability of the data for the conduction of a *factor analysis*. In other words, we wanted to ensure that there were indeed « *meaningful latent factors to be found within the data* » (Smyth & Johnson, n.d., p. 2). We ran a *Barlett's Test of Sphericity* and a *Kaiser-Mayser-Olkin* test to evaluate if the correlations within the data implied the existence of underlying factors driving more than one variable. Both tests returned statistically significant results, confirming therefore the adequacy of the data for the analysis.

By conducting an *exploratory factor analysis* (hereinafter, « EFA »), we wanted to test the validity of our research model. An EFA is used to find out underlying factors that drive the pattern of several variables at the same time. Given the deconstruction of our concepts into items in our questionnaire, we wanted to ensure that all the items associated with the same construct were perceived accordingly. In short, the EFA would help us evaluate the validity of our scale development.

Given the novelty of our subject, we decided to perform an *exploratory* instead of a *confirmatory factor analysis* (hereinafter, « CFA »). CFA is used to assess to what extent a certain model fits with the data. Our objective was rather to explore potential changes in our model. As our modelization was previously untested, we decided to leave rooms for the data to eventually suggests alterations in our model and conducted an EFA.

The decision on how many factors to extract from a *factor analysis* is central to its validity. Following Hayton, Allen, and Scarpello's recommendations (2004), we generated a *scree plot* within a *parallel analysis* that provided a visual representation of the *eigenvalues* of the factors¹. The results displayed in exhibits F.1 and F.2 of the appendices suggested the

¹ The *eigenvalues* are the amount of cumulated variance explained by the factors. Traditionally, we accept factors that have an eigenvalue above 1 as retainable.

extraction of 7 factors for both perspectives but the ambiguity of the graph made us verify this recommendation through the use of *principal axis factoring*. The several possibilities were generated and analysed. It turned out that the extraction of 6 and 7 factors respectively for the obtainer's and the provider's perspective would present the clearest structure and most likely to most accurate description of the data (Costello & Osborne, 2005). The structures of the factors extracted can be found in exhibits G.1 and G.2 of the appendices.

In an EFA, the rotation of the factors can be *orthogonal* – i.e., factors do not correlate with one another – or *oblique* – i.e., factors may correlate. Given the potential correlations between our constructs – as it is often the case in the study of social sciences –, we decided to apply an oblique rotation of the *oblimin* type in the software's model.

The relationships between items and factors are characterized by their *loadings* and their *communalities*. Firstly, an item's *loading* on a factor is the coefficient of regression of that item on that factor. In other words, a higher loading indicates a greater weighting of the item onto the factor. Secondly, *communality* is the measure of the percentage of variance of each item explained by the set of retained factors. That is, the higher the communality, the greater proportion of the item was captured by the factors. Following the literature's prescriptions, items were dropped when they had (i) minor loadings - i.e., all loadings under 0.4, (ii) cross-loading - i.e., loading above 0.4 on more than one factor –, and (iii) insufficient communality - i.e., that less than 0.4 of their variance could be explained by their related factor. In addition, we decided to drop items that *lacked content fit* with the factors that they primarily loaded onto. This decision was made in order to guarantee the interpretation of the results of the linear regression and in accordance with the literature's prescriptions (Costello & Osborne, 2005).

As far as the items of the obtainer are concerned, we have seen 7 distinct factors emerging from the results of the EFA. Factor 3 strongly encapsulates all three items related to the *intention to obtain*. Factor 5 appears to capture all items related to *miners ability* and *integrity* while items for *miners benevolence* were dropped because of loadings onto unrelated factors. *Peer ability* and *integrity* as well as *product ability* are captured by Factor 6 while *peer benevolence* items loads primarily onto Factor 2. More clearly, Factor 1 encapsulates all items related to *platform ability*, *integrity* and *benevolence*. Factor 4 is constructed by items of

miners ability and *integrity* while *miners benevolence* is captured by Factor 7. The total variance explained by the retained factors amounts to 70.63%.

More strikingly, it seems that respondents associated the *product ability* items with those of the *peer*, suggesting that obtainers consider the proper functioning of the service or the product as part of the *peer*'s responsibility.

For the items of the provider, we have decided to extract 6 factors from the EFA. Similarly, Factor 3 condenses all three items of *intention to provide*. Factor 2 encapsulates all items of *peer ability*, *integrity* and *benevolence* while Factor 6 captures all items of *platform ability*, *integrity* and *benevolence*. Factor 4 is composed of *arbitrators ability* while items related to *arbitrators integrity* and *Benevolence* are comprised in Factor 1. Finally, Factor 5 captures *miners benevolence* while items related to *miners ability* and *integrity* were dropped because of insufficient loading, cross-loading or lack of content fit. In total, 67.1% of the total variance is explained by the retained factors.

It is to be noted that a *Heywood case* was detected by the program while running EFA on the provider perspective for the item 2 of *intention to provide*. These results suggest that there was a negative value for the variance of this item that has led to a loading above 1. Results of the provider EFA must therefore be interpreted with caution, possibly due to the small size of the sample used (Costello & Osborne, 2005).

The list of factors, the loadings of the items and the corresponding references associated with them for internal use for the obtainer's and the provider's perspectives are respectively summarized in exhibits H.1 and H.2 of the appendices. We consider the loading of 9 items on single factors on both perspectives as valid because they correctly refer to the constructs of *peer* and *platform* and are therefore coherent with our theoretical model.

1.2.1 Multiple Linear Regression

Following the exclusion of the selected items, the weights of each retained factor were multiplied with the corresponding items of the standardized data that had been collected. Weighting each item's score into their corresponding factors generated the *factor scores*. These scores were consequently used as variables in *multiple linear regression models*. Factor 3, that captures *intention to consume*, was modelled as the dependent variable with the other

factors set as independent variables. The generation of data plot showing the relationship between each independent variable and Factor 3 testified of no other dependence than a simple linear one. Therefore we decided to include the factors as they had been generated through the EFA. By the creation of dummy variables, we integrated to the model the control variables for *gender* (0="Man" and 1="Woman"), *age category* (0=[12-18], 1=[18-25], 2=[25-35], 3=[35-50], 4=[50-65] and 5=[65+]) and *Blockchain awareness* (0="None", 1="Small", 2="Medium", 3="High" and 4="Complete") as categorical variables. The risk propensity of participants and their level of experience with AirBnb both as a guest and as a host were integrated directly into the model as discrete variables.

Figure 3: Models of Multiple Linear Regression Used in this Research

$$FS_{3i} = \alpha + \beta_1 FS_{1i} + \beta_2 FS_{2i} + \beta_4 FS_{4i} + \beta_5 FS_{5i} + \beta_6 FS_{6i} (+ \beta_7 FS_{7i})^* + \delta_{gi} G \\ + [\delta_{ai} A_x]_{x=[1-5]} + [\delta_{Bi} B_x]_{x=[1-4]} + \beta_R RP_i + \beta_H EH_i + \beta_g EG_i + \varepsilon_i$$

* only valid for obtainer's perspective.

With :

- α = the coefficient of the intercept;
- FS_{xi} = the score of factor x for observation i;
- β_x = the regression coefficient of factor x or control variable x;
- δ_{xi} = the binary value of the corresponding category of variable x for observation i;
- G = the coefficient for female observation;
- A_x = the coefficient of the corresponding category of the age variable x;
- B_x = the coefficient for the corresponding category of Blockchain awareness variable x;
- β_R = the regression coefficient of the variables risk propensity;
- RP_i = the score of risk propensity for observation i;
- β_H = the regression coefficient of the variable host experience;
- EH_i = the score of host experience for observation i;
- β_g = the regression coefficient of the variable guest experience;
- EG_i = the score of guest experience for observation i;
- ε_i = the model error associated with observation i;

The results of both regressions are shown in exhibits I.1 and I.2 of the appendices.

2. Results

2.1. Reconsideration of Hypotheses

« No amount of experimentation can ever prove me right; a single experiment can prove me wrong. »

Einstein, 1919, p. 2.

In our efforts to understand and measure the influence of trust on the intention to participate to blockchain peer-to-peer platforms, we have collected the attitudes of people toward using our hypothetical accommodation-sharing application through the use of a questionnaire. While attempting to reconstitute the constructs developed in our framework, the results of our EFA conflicted with the theoretical conceptualization presented. The integration of the factors validated by the EFA into a *multiple linear regression* provided the confirmation and the refutation of some of our hypotheses stated in section 2 of chapter 3.

Overall, the p-values associated with both regressions demonstrated a correlation between the models and the independent variables. However, a more detailed study of the results is needed to understand the significance of our models.

2.1.1 Obtainer's Perspective

On the one hand, the results validated some of the stated hypotheses. First, the model testified that higher levels of trust toward the retained dimensions of the *arbitrators* - namely *ability* and *integrity* - increases the *intention to obtain*. More strikingly, the influence of the trust in the *platform ability*, *integrity* and *benevolence* was also found to be highly significant. Additionally, the analysis of control variables suggested that being a female and having high level of experience as a host on Airbnb positively correlates with the *intention to obtain*. However, the significance of these last two variables can be questioned as their p-values were above the generally accepted threshold of 0.05 but still scored below 0.1.

On the other hand, other hypotheses were not validated as their corresponding factors failed to yield sufficient levels of significance. Namely, *trust in peer*, *product* and *miners* seemed to hold little influence over the ultimate *intention to obtain*. Additionally, our model did not

demonstrate a significant level of correlation between the dependent variable and the control variables of *age*, *risk propensity*, *host experience on AirBnb* or *Blockchain awareness*

2.1.2 Provider's Perspective

Similarly, the regression applied on the variables of the provider confirmed some of our intuitions that were embodied in the hypotheses. *Trust in platform* appeared to positively influence the *intention to provide* with a level of significance more than acceptable. The result also yielded a significant positive influence of the *risk propensity* on the dependent variable.

On the other hand, the other variables failed to validate other hypotheses. The *arbitrators ability* as well as *integrity* and *benevolence*, appeared non significantly related to the dependent variable. Similarly, *trust in peer ability*, *integrity* and *benevolence* as well as the retained factor capturing *miners benevolence* failed to demonstrate significative intercorrelations with the dependent variables. Control variables of *gender*, *age* and *Blockchain awareness* did not show significant correlation either. Finally, previous experiences either as host or as a guest on AirBnb did not appear to bear significant influence.

In summary, hypotheses 2 and 7 were validated beyond any doubt within the context of this reasearch. Moreover, hypothesis 5 was partially confirmed as *arbitrators benevolence* was not captured by the retained factors. However, hypotheses 1, 3, 4, 6, 8 and 9 could not not be confirmed based on the results of this research. The summary of the reconsideration of our hypotheses can be found on the next page.

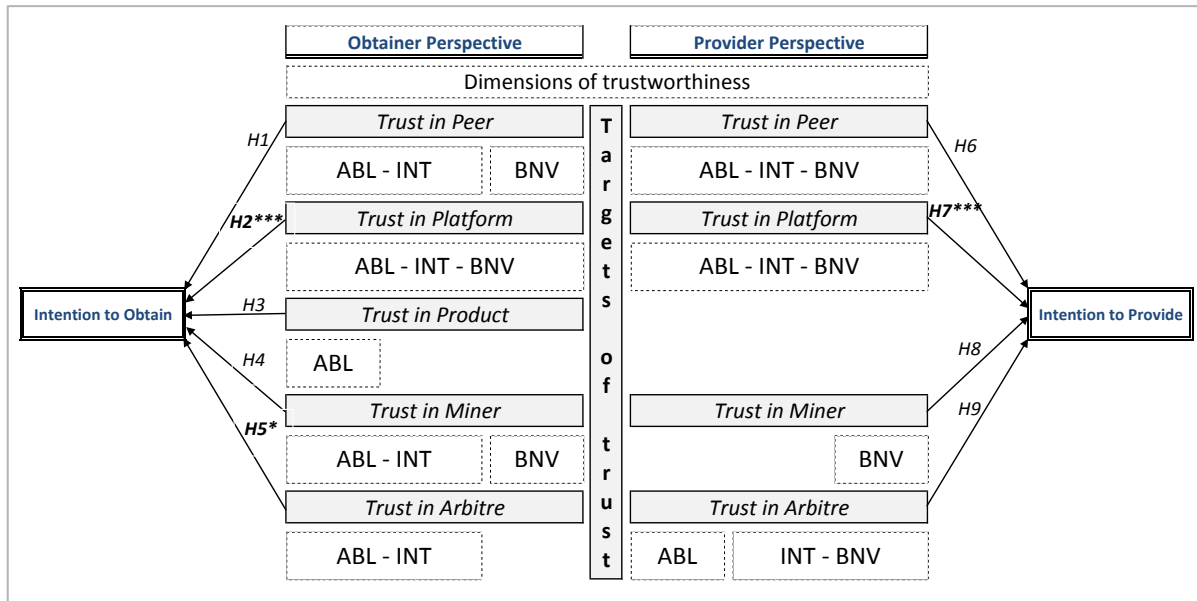


Figure 3: Reconsideration of the hypotheses on the research model of trust within blockchain peer-to-peer marketplaces applied to BlockBnb.

(ABL = Ability; INT = Integrity; BNV = Benevolence; * = Proven Significant).

The elements of theory selected, the business model used for the survey, the construction of the items of the questionnaire, the choices made during the EFA and the modelisation of the regressions all impacted the results of this research with some bias. We have presented the justifications for the choices made in our methodology and these have to be taken into account to correctly appreciate the extent of the validity of our results.

2.2. Discussion

Throughout this paper, we have attempted to evaluate the potential influence of Blockchain over peer-to-peer sharing platforms. Assessing the claims that the technology would reduce the need for trust and increase its popularity, we have confronted the existing literature on the importance of trust within peer-to-peer applications with the characteristics of the Blockchain.

In the beginning, our primary review of literature on the sharing economy re-established the concept of trust as a primary driver behind consumers' participation. During our research, we came across various attempts to frame the mental representation of this trust in order to develop practical strategies to influence users' participation. As a base to develop our own framework adapted to blockchain sharing environments, we have selected the 3P model for its comprehensiveness and its contemporary relevance in the field of research.

Subsequently, we have reviewed the Blockchain technological capabilities to fully appreciate the limits of their *trust-free* features and better understand the realistic expectations of their implementations in a sharing context. The insights provided appeared to temper the *trust-free* claimed benefits as the interactions between the algorithmic-based application and its users would still require the involvement of a number of actors, some of them new, who would need to demonstrate trustworthiness toward the users in order to gain trust and foster participation. With this new understanding, we have adjusted the 3P framework to fit within a Blockchain ecosystem.

At last, we have built a questionnaire with the items of our conceptualization and developed the theoretical business model of a blockchain accommodation-sharing application. The survey appreciated the perceptions and attitudes of the participants toward the dimensions of trustworthiness of *ability*, *integrity* and *benevolence* of the actors involved in the platform's ecosystem : *peer*, *platform*, *product*, *miners* and *oracles*. The results were used to assess the influence of trust on users' willingness to participate from an *obtainer* and a *provider* perspective as well as to test the suitability of our framework.

This research has led me to conclude that the general audience shows a conservative attitude toward participating in a blockchain peer-to-peer accommodation-sharing platform. The average score of the items related to *Intention to obtain* are respectively 2.75, 2.6 and 2.2 out of 6 on the Likert scale and 2.6, 2.4 and 2.1 for the items related to *Intention to provide* on BlockBnb.

The items of the survey attempted to break down the general attitudes of participants into their perception of the trustworthiness of the actors. Looking at the results of the linear regression models, the perceived *trust in platform* appears to play a significant role in both intentions to consume. Its influence is positively correlated, confirming hypotheses 2 and 7 made earlier in this paper. More strikingly, it confirms the ongoing importance of the *platform* in a blockchain environment. While some authors had argued that its trust components would become irrelevant, this study shows that the organization, its developers and its algorithms, still have to appear trustworthy. This influence is greater on the *intention to provide*, suggesting that providers would have more at stake in their relationships with the platform. This intuition is substantiated by past researches that have shown that a supplier will be more

vulnerable toward the actions of a platform because they rely on it as a source of income. This goes in pair with the significant influence played by the *risk propensity* of users. Risk-seeking users seemed more likely to provide than risk-averse users, but this does not appear to be true from an obtainer's perspective. It is likely that the risks incurred by providers are perceived as greater than by obtainers, illustrating the greater perception of vulnerability of providers toward the platform.

From an obtainer's perspective, the factor capturing *arbitrator ability* and *integrity* is also positively correlated with the intention to participate and proven statistically relevant. The arbitration system puts in place on BlockBnb suggests that disputes are resolved by other users who are unbiased toward guests or hosts. Nevertheless, the same dimensions do not appear to yield significant influence on the *intention to provide*. Past experiences as a guest on Airbnb also positively correlate with the dependent factor, substantiating the claim that past experiences help decrease uncertainty and foster intentions to participate in a model that has already been experienced by the user. At last, the female gender appears to positively correlate with the *intention to obtain*.

The population sampled expressed a relatively low level of *Blockchain awareness*, which could bias the results. Given the stage of development of the Blockchain, it is likely that the general audience is skeptic toward the technology, influencing the final results of our survey. All things considered, this observation on the methodology provides us with some insights about the maturity of the technology and how ready to integrate its features is the market. The positive influence of risk propensity on the *intention to provide* also suggested that early-adopters are a more suited audience for blockchain companies to target as of now.

On the matter of the research itself, it appears that our attempt to conceptualize trust in Blockchain environment requires some adjustments. The results of the EFA showed discrepancies between the theoretical model suggested in section 2 of chapter 3 and the actual perceptions of our participants. *Arbitrators benevolence* vanished from an obtainer's perspective as it failed to be properly captured by a factor. *Product ability* seemed to be associated with *peer* components because their items were captured by the same underlying factor. One possible reason could be an assumption that the providing peer is actually held responsible for the ability of its assets to perform properly. Similarly, *miners ability* and *integrity* were clearly identified by participants as the part of the same dimension, while

benevolence was perceived as separated. We can see here the limits of the accredited role of the *miners* who act purely as commercial agents that must not be influenced by preferential attitudes toward users.

The conceptualization of the provider's perspective appeared more clear-cut and better fit to the mental representation of participants. Still, *miners ability* and *integrity* failed to be captured by any factor whereas *benevolence* was encapsulated by one. *Arbitrators ability* was separated from *integrity* and *benevolence*, further putting in doubt the suitability of the proposed conceptualization for the new targets of *miners* and *arbitrators*. Additionally, trustworthiness dimensions from the *arbitrators* and *miners* showed a tendency to be grouped together through the EFA. It could mean that, in the minds of participants who are unfamiliar, the two new emerging actors of a blockchain environment are confused together given the novelty of their concepts.

Finally, the business model of BlockBnb was used as an example of the implementation of Blockchain in a peer-to-peer marketplace but ultimately heavily influenced the results of this research. The overall poor intentions of participation can also be explained by the inadequacy of its business model which would need to be refined in order to better fit with the market's expectations.

Eventually, this paper contributed to the efforts to bridge the technology of the Blockchain with its application in the field of the sharing economy. The tools developed during the study – e.g., the conceptualization, the business model, the questionnaire and the methodology – can be used as a basis for further research to refine and expand the understanding of how these two fields can eventually coexist in the scientific literature and in the business world.

D. Conclusions

The impact of Blockchain on the popularity of peer-to-peer sharing platforms appears more mitigated than our primary research had led us to believe. Overall, we sense a lack of enthusiasm from the market for blockchain applications, as the majority of our participants were reluctant to use our platform. This distrust can easily be understood in light of the excesses that took place during the hype period. The reputation of Blockchain as a whole has emerged damaged, and that justifies the accrued caution exercised by individuals. Based on our results and considering the maturity of the expectations of the market, reaching critical mass of users on a blockchain accommodation-sharing application in the like of BlockBnb appears troublesome at the moment. Ultimately, we believe that the underlying Blockchain technology would need to grow in popularity for blockchain applications to be able to reach a mass audience.

Furthermore, the claim of the *trust-free* environment introduced by Blockchain has been debunked to some extent. Our study found no conclusive evidence that the dimensions of *peer*, *product* and *miners* had an influence on users' attitudes toward participation. This conclusion leaves the debate open to the suggestion that there is indeed a reduction of the need for trust in a blockchain environment. However, there is significant evidence to confirm the relevancy of the dimensions of the *platform* and some subconstructs of the *oracles* in the equation of trust. In light of this renewed importance of trust in a blockchain sharing environment, blockchain platforms not only need to appear trustworthy in order to incentivize participation and generate business, they also need to create an environment of trust among the different actors of its ecosystem. In the future, a deeper understanding of the role and origins of trust would enable platforms to harness the behavioral dynamics at play and increase their popularity.

Regarding the path to this understanding, we have developed what appears to be an imperfect representation of the mental users' mental perception of trust. While the adequacy of some dimensions was empirically confirmed, others appeared to be confused in the minds of participants. This observation suggests that some improvements to our model are required to mirror users' mental modelization of trust and be able to deploy its insights on business strategies.

E. Limitations

The conclusions of this research must be considered in light of the inherent choices and other elements that introduce bias into the results and limit their validity. The main limitations of this research are the theoretical background selected, the approach taken in our questionnaire and the characteristics of our sample.

First of all, our selection of the 3P model of trust was motivated by its comprehensiveness, adapted to the research of a nascent and little-explored field such as Blockchain. It is to be kept in mind that the selection of another framework of reference would have led the study onto a different path and possibly yield different conclusions.

Secondly, we understand the limits imposed by our choice to survey people about a situation which was unknown to them. The degree of abstraction required to project themselves into their hypothetical use of a fictional and original platform limits the reliability of the answers provided by the participants. Indeed, their hypothetical attitude toward the questions could be different from those that they would effectively have if actually presented with the situation in real-life. Of course, this limit is inherent to all research based on surveys of people, but it is particularly true for those who present participants with unprecedented situations, such as this research. Furthermore, the use of BlockBnb to illustrate this situation was necessary for respondents to be able to project themselves with realism. On the other hand, it also heavily influenced the results. The question remains about the degree of generalization to all blockchain peer-to-peer sharing platforms that we can perform on our results. The validity of our results outside of the context of this research must be done with caution and with a complete awareness of its methodology.

Thirdly, the population sampled introduced an important bias into our results as well. The data underlying our study was collected from 168 volunteering individuals contacted within our social circles and through social media and personal communication. Although all age categories and genders were displayed, our sample was not representative of a broader population. Therefore, the other question remains whether our conclusions can be generalized to a more comprehensive range of potential consumers of the sharing economy. Additionally, the voluntary participation of individuals may introduce some bias intentions of participation as well.

In addition to these major sources of limitations, we have identified smaller factors that may still have bore their influence on the results of this research.

In the first place, the itemization of the concepts through *scale development* theory is a subjective approach which could lead to a different result if conducted by a different researcher. These items being the basis to collect participants' attitudes, their formulations ultimately influence our conclusions.

Furthermore, participants were asked to self-assess two variables among a range of pre-defined possibilities, namely their *risk propensity* and *Blockchain awareness*. A more scientifically valid approach would have been to evaluate these items through proven and indirect methods. However, we decided not to make the questionnaire more complex given its already-considerable length. This last point is especially relevant when we consider that the amount of concentration required has probably influenced the validity of our data as well. Moreover, these points did not constitute the core of our study. Finally, in order to further decomplexify our questionnaire, items were presented in a non-random order. Their systematic sequencing probably also influenced the degree of internal consistency of items within a construct.

At last, the statistical methods selected need to be taken into account as well. The EFA is a complex method that forces the researcher to exercise their judgment. Additional confirmatory methods could have been used to further verify its results. However, this paper only intended to conduct a preliminary analysis to test the validity of the theory-based conceptualization.

F. Future Directions for Research

Further studies could focus on validating our results and improving the relevance of our conclusions. An adaptation of the items of our survey based on the findings of our work and the utilization of additional or different theoretical models can help substantiate the conclusions of this research. For instance, the positive influence of the *platform* demonstrated in this paper could be further analysed when broken down into its components of *code*, *coders* and *company*.

Additionally, the use of more sophisticated statistical approaches, such as confirmatory factor analysis, applied on a broader and more representative sample and based on another application of the technology can ultimately enrich our general understanding of the influence of trust in blockchain sharing environments.

As hinted in the results, the maturity of the market expectations toward Blockchain makes it prone to be adopted by a class of early-adopters instead of the general audience. The shortcomings of the sample used did not allow us to substantiate that assumption but additional surveys could assess the current intentions of early-adopters toward using a blockchain peer-to-peer platform.

Finally, the search for a research model of trust in blockchain peer-to-peer applications can be continued based on the findings of our work. The dimensions that have been proven irrelevant can be altered or eliminated while new ones can emerge from additional literature reviews and intuitions. In the end, it is about conceptualizing trust in accordance with people's mental representation in order to understand its dynamics and for businesses to establish strategies leveraging its components and their influence.

G. Bibliography

- Andreotti, A., Anselmi, G., Eichhorn, T., Hoffmann, C.P., Jürss, S., & Micheli, M. (2017). *European Perspectives on Participation in the Sharing Economy*. doi:10.2139/ssrn.3046550.
- Avital, M., Beck, R., King, J. L., Rossi, M., & Teigland, R. (2016). *Jumping on the Blockchain Bandwagon: Lessons of the Past and Outlook to the Future*. Proceedings of the 37th International Conference on Information Systems, Dublin. Retrieved from <https://pdfs.semanticscholar.org/6a8b/e9a71ff4a72e1c31426e88e0ec08e9a6ceb4.pdf>, July 5, 2018.
- Avital, M., Carrol, J.M., Hjalmarsson, A., Levina, N., Malhotra, A., Sundararajan, A. (2015). *The Sharing Economy: Friend or Foe?*. Paper presented at the 36th International Conference on Information Systems, Fort Worth. Retrieved from https://www.researchgate.net/publication/289460588_The_Sharing_Economy_Friend_or_Foe, June 18, 2018.
- Bachelier, L. (1900). Théorie de la Spéculation. *Annales Scientifiques de l'École Normale Supérieure*, 3(17), 21–86.
- Ballard, B. (2015). *The rise of the sharing economy*. Retrieved from <https://www.itproportal.com/2015/02/13/rise-sharing-economy/>, July 5, 2018.
- Bardhi, F., & Eckhardt, G. (2012). Access-Based Consumption: The Case of Car Sharing. *Journal of Consumer Research*, 39(4), 881-898. doi:10.1086/666376.
- Barros, P. (2013). *Collaborative Consumption and the Sharing Economy in Developing Markets*. Retrieved from http://www.sustainablebrands.com/news_and_views/behavior_change/collaborative-consumption-and-sharing-economy-developing-markets, June 28, 2018.
- Barter, P. (2013). *Cars are parked 95% of the time. Let's check*. Retrieved from <http://www.reinventingparking.org/2013/02/cars-are-parked-95-of-time-lets-check.html>, June 15, 2018.
- Bashir, I. (2017). *Mastering Blockchain: Distributed ledgers, Decentralization and Smart Contracts Explained*. Birmingham: Packt Publishing.
- BeeNest. (2018). *The Bee Token : The Future of Decentralized Sharing Economy*. Retrieved from https://s3-us-west-2.amazonaws.com/beenest-public/whitepaper/bee_whitepaper_v3.pdf, July 10, 2018.
- Belk, R. (1988). Possessions and the extended self. *Journal of Consumer Research*, 15(2), 139-168. doi:10.1086/209154.
- Belk, R. (2013). You are what you can access: Sharing and collaborative consumption online. *Journal of Business Research*, 67(8), 1595-1600. doi:10.1016/j.jbusres.2013.10.001

Benkler, Y. (2004). Sharing Nicely: On Shareable Goods and the Emergence of Sharing as a Modality of Economic Production. *The Yale Law Journal*, 114(2), 273-358. doi:10.2307/4135731.

Blockchain France. (2016). *La fin de l'idéal trustless* [The end of the trustless ideal]. Retrieved from <https://blockchainfrance.net/2016/07/20/la-fin-de-lideal-trustless/>, July 12, 2018.

Botsman, R. (2012). *Rachel Botsman : The currency of the new economy is trust* [Video file]. Retrieved from https://www.ted.com/talks/rachel_botsman_the_currency_of_the_new_economy_is_trust?language=fr#t-264567, June 28, 2018.

Botsman, R. (2013). *The Sharing Economy Lacks a Shared Definition*. Retrieved from <http://www.fastcoexist.com/3022028/the-sharing-economy-lacks-a-shared-definition>, June 5, 2018.

Botsman, R. (2015). *Defining the Sharing Economy: What is Collaborative Consumption - And What Isn't?*. Retrieved from <https://www.fastcompany.com/3046119/defining-the-sharing-economy-what-is-collaborative-consumption-and-what-isnt>, June 5, 2018.

Botsman, R., & Rogers, R. (2010). *What is mine is yours: The rise of the collaborative consumption*. New-York, NY: Harper Business.

Box, G.E.P. (1979). Science and Statistics. *Journal of the American Statistical Association*, 71(356), 791-799. doi:10.1080/01621459.1976.10480949.

Brinker, S. (2018). *One thing everybody forgets about the Gartner's hype cycle*. Retrieved from <https://thinkgrowth.org/one-thing-everybody-forgets-about-gartners-hype-cycle-ecfe7e9de8ff>, July 25, 2018.

Brodersen, S. (2017). *How does the sharing economy thrive in a "trust crisis"?*. Retrieved from <https://magazine.vunela.com/how-does-the-sharing-economy-thrive-in-a-trust-crisis-e6f9ecef7e6>, June 15, 2018.

Butterin, V. (2017). *The Meaning of Decentralization*. Retrieved from <https://medium.com/@VitalikButerin/the-meaning-of-decentralization-a0c92b76a274>, July 4, 2018.

Campbell Mithun. (2012). *National Study Quantifies the "Sharing Economy" Movement*. Retrieved from <https://www.prnewswire.com/news-releases/national-study-quantifies-the-sharing-economy-movement-138949069.html>, June 13, 2018.

CB Insights. (n.d.). *The Global Unicorn Club*. Retrieved from <https://www.cbinsights.com/research-unicorn-companies>, June 8, 2018.

Chehimi, N. (2013). *The social web in the hotel industry: The impact of the social web on the information process of German hotel guests*. Springer Gabler.

Chen, S., & Dhillon, G. (2003). Interpreting Dimensions of Consumer Trust in E-commerce. *Information Technology and Management* 4(2), 303 - 318. doi :10.1023/A:1022962631249

Codagnone, C., & Martens, B. (2016). *Scoping the Sharing Economy: Origins, Definitions, Impact and Regulatory Issues*. doi:10.2139/ssrn.2783662.

CoinMarketCap. (n.d.). *Total Market Capitalization*. Retrieved from <https://coinmarketcap.com/charts/>, July 23, 2018.

Comer, J., Plank, R., Reid, D., & Pullins E. (1999). Methods in Sales Research: Perceived Trust in Business-to-Business Sales: A New Measure. *Journal of Personal Selling & Sales Management*, 19(3), 61-71. doi:10.1080/08853134.1999.10754182.

Cook, J.D., Hepworth, S.J., Wall, T.D., & Warr, P.B. (1981) *The Experience of Work*. London: Academic Press.

Conte, C. (2016). *The Triangular Trust in the Sharing Economy* (Master's Thesis). Università Ca' Foscari Venezia, Venezia. Retrieved from <http://dspace.unive.it/bitstream/handle/10579/8648/837238-1202887.pdf?sequence=2>, July 4, 2018.

Costello, A., & Osborne, J. (2005). Best Practices in Exploratory Factor Analysis: Four Recommendations for Getting the Most From Your Analysis. *Practical Assessment, Research & Evaluation*, 10(7), 1-9. doi:10.12691/jpar-2-1-2.

Devine, T. (2014). *The 6 risks for sharers in the Sharing Economy*. Retrieved from https://www.huffingtonpost.com/ted-devine/the-6-risks-for-sharers-i_b_5186282.html, June 15, 2018.

Einav, L., Farronato, C., & Levin, J. (2016). Peer-to-Peer Markets. *Annual Review of Economics*, 8(1), 615-635. doi:10.1146/annurev-economics-080315-015334.

Einstein, A. (1919). Induction and deduction in physics. *Scientia Studia* 3(4), 663-664.

Fine, J. (2016). How Craigslist's Founder Realized He Sucked as a Manager. *Inc. Magazine*. Retrieved from <https://www.inc.com/magazine/201609/jon-fine/inc-interview-craigslist.html>, June 29, 2018.

Frenken, K., & Schor, J. (2017). Putting the sharing economy into perspective. *Environmental Innovation and Societal Transitions*, 23, 3-10. doi:10.1016/j.eist.2017.01.003.

Gefen, D., Benbasat, I., & Pavlou, P.A. (2008). A Research Agenda for Trust in Online Environments. *Journal of Management Information Systems*, 24(4), 275-286. doi: 10.2753/MIS0742-1222240411.

Gefen, D., & Heart, T. (2006). On the need to include national culture as a central issue in e-commerce trust beliefs. *Journal of Global Information Systems*, 14(4), 1-30. doi:10.4018/jgim.2006100101.

Gefen, D., & Straub, D. W. (2004). Consumer trust in B2C e-Commerce and the importance of social presence: experiments in e-Products and e-Services. *Omega*, 32(6), 407-424. doi:10.1016/j.omega.2004.01.006.

Gipp, B., Meuschke, N., & Gernandt, A. (2015). *Decentralized Trusted Timestamping using the Crypto Currency Bitcoin*. Paper presented at the iConference 2015, Newport Beach. Retrieved from <https://www.weusecoins.com/assets/pdf/library/Decentralized%20Trusted%20Timestamping%20using%20the%20Crypto%20Currency%20Bitcoin.pdf>, June 18, 2018.

Glaser, F. (2017). *Pervasive Decentralisation of Digital Infrastructures: A Framework for Blockchain enabled system and Use Case Analysis*. Paper presented at the 50th Hawaii International Conference on System Sciences, Waikoloa Village. doi:10.24251/HICSS.2017.186.

Gliem, A.J., & Gliem, R.R. (2003). *Calculating, Interpreting, And Reporting Cronbach's Alpha Reliability Coefficient For Likert-Type Scales*. Paper presented at 2003 Midwest Research to Practice Conference in Adult, Continuing, and Community Education, Columbus. Retrieved from <https://scholarworks.iupui.edu/handle/1805/344>, July 24, 2018.

Goldman Sachs. (n.d.). *Millennials, coming of age*. Retrieved from <http://www.goldmansachs.com/our-thinking/pages/millennials/>, June 13, 2018.

Grandhi, R. (2018). *The art and science of asking questions is the source of all knowledge!*. Retrieved from <https://medium.com/@diwakargrandhi/the-art-and-science-of-asking-questions-is-the-source-of-all-knowledge-b49144e2479c>, July 28, 2018.

Grybaitė, V., & Stankevičienė, J. (2016). Motives for participation in the sharing economy – evidence from Lithuania. *Engineering Management in Production and Services*, 8(4), 7-17. doi:10.1515/emj-2016-0028.

Guadagnoli, E., & Velicer, W. F. (1988). Relation of sample size to the stability of component patterns. *Psychological Bulletin*, 103(2), 265-275. doi:10.1037/0033-2909.103.2.265.

Hagui, A., & Rothman, S. (2016). *Network Effects Aren't Enough*. Retrieved from <https://hbr.org/2016/04/network-effects-arent-enough>, June 10, 2018.

Hamari, J., Sjöklint M., & Ukkonen A. (2016). The sharing economy: Why people participate in collaborative consumption. *Journal of the Association for Information Science and Technology*, 67(9), 2047-2059. doi:10.1002/asi.23552.

Haralabopoulos, G., Anagnostopoulos, I., & Zeadally, S. (2016). The Challenge of Improving Credibility of User-Generated Content in Online Social Networks. *Journal of Data and Information Quality*, 7(3), 1-4. doi:10.1145/2899003.

Hawlitshchek, F., Teubner, T., & Gimpel, H. (2016). *Understanding the Sharing Economy: Drivers and Impediments for Participation in Peer-to-Peer Rental*. Paper presented at the 49th Hawaii International Conference on System Sciences, Koloa. Retrieved from <https://dl.acm.org/citation.cfm?id=2919143>, July 5, 2018.

Hawlitshchek, F., Teubner, T., & Weinhardt, C. (2016). Trust in the Sharing Economy. *Die Unternehmung*, 70(1), 26-44. doi:10.5771/0042-059X-2016-1-26.

Hawlitsek, F., Teubner, T., Adam, M., Borchers, N., Möhlmann, M., & Weinhardt, C. (2016). *Trust in the Sharing Economy: An Experimental Framework*. Paper presented at the 37th International Conference on Information Systems, Dublin. Retrieved from https://www.researchgate.net/publication/309204479_Trust_in_the_Sharing_Economy_An_Experimental_Framework, July 6, 2018.

Hayton, J., Allen, D., & Scarpello, V. (2004). Factor Retention Decisions in Exploratory Factor Analysis: A Tutorial on Parallel Analysis. *Organizational Research Methods*, 7(2) : 191-205. doi:10.1177/1094428104263675.

Hendler, J. & Golbeck, J. (2008). Metcalfe's law, Web 2.0, and the Semantic Web. *Web Semantics: Science, Services and Agents on the World Wide Web*, 6(1), 14 - 20. doi:10.1016/j.websem.2007.11.008.

Hidalgo, C. (2015). *Why information grows : The evolution of order, from atoms to economies*. New-york, NY: Basic Books.

Hinkin, T. R. (1998). *A brief tutorial on the development of measures for use in survey questionnaires*. Retrieved from <http://scholarship.sha.cornell.edu/articles/521>, July 15, 2018.

Hsu, M.-H., Ju, T. L., Yen, C.-H., & Chang, C.-M. (2007). Knowledge sharing behavior in virtual communities: The relationship between trust, self-efficacy, and outcome expectations. *International Journal of Human-Computer Studies*, 65(2), 153-169. doi:10.1016/j.ijhcs.2006.09.003.

Iansity, M., & Lakhani, K. (2017). *The truth about Blockchain*. Retrieved from <https://www.hbs.edu/faculty/Pages/item.aspx?num=52100>, July 23, 2018.

John, N.A. (2013). The social logics of sharing. *The Communication Review*, 16(3), 113–131. doi:10.1080/10714421.2013.807119.

Kelley, H. (1979). *Personal relationships: Their structures and processes*. Hillsdale, N.J: L. Erlbaum Associates.

Kelley, H. H., & Thibaut, J. W. (1978). *Interpersonal relations: A theory of interdependence*. New-York, NY: Wiley.

Lamberton, C., & Rose, R. (2012). When Is Ours Better Than Mine? A Framework for Understanding and Altering Participation in Commercial Sharing Systems. *Journal of Marketing* 76(4), 109-125. doi:10.1509/jm.10.0368.

Lawpath. (n.d.). *The Definitive List of Online Marketplaces*. Retrieved from <https://lawpath.com.au/the-definitive-list-of-online-marketplaces>, June 16, 2018.

Leonard, L. (2012). Attitude influencers in C2C E-commerce: Buying and selling. *Journal of Computer Information Systems* 52(3), 11–17. doi:10.1080/08874417.2012.11645554.

Leyden, P. [Reinvent]. (2016, September 2). Will Crowd-based Capitalism Replace Managerial Capitalism? (Interview of Arun Sundararajan) [Video File]. Retrieved from <https://www.youtube.com/watch?v=y2p6JJV6dIc>, June 14, 2018.

Libert, B., Wind, Y., & Beck, M. (2014). *What Airbnb, Uber and Alibaba have in Common*. Retrieved from <https://hbr.org/2014/11/what-airbnb-uber-and-alibaba-have-in-common>, July 3, 2018.

Lu, Y., Zhao, L., & Wang, B. (2010). From virtual community members to C2C e-commerce buyers: Trust in virtual communities and its effect on consumers' purchase intention. *Electronic Commerce Research and Applications*, 9(4), 346-360. doi:10.1016/j.elerap.2009.07.003.

Lundy, L. (2016). *Blockchain and the Sharing Economy 2.0 : the real potential of Blockchain for developers*. Retrieved from <https://www.ibm.com/developerworks/library/iot-blockchain-sharing-economy/index.html>, July 7, 2018.

Lustig, C., & Nardi, B. (2015). *Algorithmic Authority: The Case of Bitcoin*. Paper presented at the 48th Hawaii International Conference on System Sciences, Kauai. Retrieved from <https://xplore.staging.ieee.org/servlet/opac?punumber=706809>.

Malone, T. W., Yates, J., & Benjamin, R. I. (1987). Electronic markets and electronic hierarchies. *Commun. ACM*, 30(6), 484-497. doi:10.1145/214762.214766.

Marchi, A., & Parekh, E.J. (2015). How the sharing economy can make its case. *McKinsey Quarterly*. Retrieved from <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/how-the-sharing-economy-can-make-its-case>, July 3, 2018.

Mastercard. (2017). *The Sharing Economy: Understanding the Opportunities for Growth*. Retrieved from https://newsroom.mastercard.com/eu/files/2017/06/Mastercard_Sharing-Economy_v7.compressed2.pdf, July 3, 2018.

Maurer, B., Nelms, T.C., & Swartz, L. (2013). « When Perhaps the Real Problem Is Money Itself! » The Practical Materiality of Bitcoin. *Social Semiotics*, 23(2), 261-277. doi:10.1080/10350330.2013.777594.

Mayer, R., Davis, J., & Schoorman, D. (1995). An Integrative Model of Trust. *The Academy of Management Review* 20(3), 709-734. doi:10.2307/258792

Mazzella, F., Sundararajan, A., D'Espous, V.B., & Möhlmann, M. (2016). *How digital trust powers the sharing economy*. doi:10.15581/002.ART-2887.

McClure, D. (n.d.). Retrieved from <http://www.brainyquote.com>, July 26, 2018.

Meelen, T., & Frenken M. (2015). *Stop Saying Uber Is Part of the Sharing Economy*. Retrieved from <http://www.fastcoexist.com/3040863/stop-saying-uber-is-partof-the-sharing-economy>, June 6, 2018.

- Meijer, D.B. (2017). *Consequence of the implementation of Blockchain Technology* (Master's Thesis). Technische Universiteit, Delft. Retrieved from [uuid:da0b8d80-d19e-4149-bfbd-64b0ca79042a](https://www.researchgate.net/publication/320144444), July 14, 2018.
- Mittendorf, C. (2016). *What Trust means in the Sharing Economy: A provider perspective on Airbnb.com*. Paper presented at the 22nd Americas Conferences on Information Systems, San Diego. Retrieved from <https://pdfs.semanticscholar.org/a3b5/e6a0dd13a63fcf8ad41a3b17dbbac4535722.pdf>, June 15, 2018.
- Möhlmann, M. (2015). Collaborative consumption: determinants of satisfaction and the likelihood of using a sharing economy option again. *Journal of Consumer Behaviours*, 14, 197 - 207. doi:10.1002/cb.1512.
- Möhlmann, M. (2016). *Digital Trust and Peer-to-Peer Collaborative Consumption Platforms: A Mediation Analysis*. doi:10.2139/ssrn.2813367.
- Nakamoto, S. (2008). *Bitcoin : A Peer-to-Peer Electronic Cash System*. Retrieved from <https://bitcoin.org/bitcoin.pdf>, June 4, 2018.
- Neilson, L. A. (2010). Boycott or boycott? Understanding political consumerism. *Journal of Consumer Behaviour* 9(3): 214–227.
- Notheisen, B., Hawlitschek, F., & Weinhardt, C. (2017). *Breaking Down the Blockchain Hype - Towards a Blockchain Market Engineering Approach*. Paper presented at the 25th European Conference on Information Systems , Guimarães. Retrieved from http://aisel.aisnet.org/ecis2017_rp/69/, July 13, 2018.
- Ownership Society, (2018). In *Wikipedia*. Retrieved from https://en.wikipedia.org/wiki/Ownership_society, June 28, 2018.
- Pal, A. (2018). *Blockchain name-grabbing has echoes of dotcom bubble*. Retrieved from <https://www.reuters.com/article/us-blockchain-companies/blockchain-name-grabbing-has-echoes-of-dotcom-bubble-idUSKBN1FS1F3>, July 25, 2018.
- Panetta, K. (2018). *The CIO's Guide to Blockchain*. Retrieved from <https://www.gartner.com/smarterwithgartner/the-cios-guide-to-blockchain/>, July 15, 2018.
- Pavlou, P.A., & Gefen, D. (2002). *Building effective online marketplaces with institution-based trust*. Proceedings of the 23rd International Conference on Information Systems, 667-675.
- Petroski, H. (2009). *Hit or Miss Revolutions*. Retrieved from <https://www.forbes.com/2009/09/22/henry-petroski-history-technology-revolutionary-petroski.html#33ece3d36067>, July 20, 2018.
- Petty, C. (2018). *The Irrational Exuberance That is Blockchain*. Retrieved from <https://www.gartner.com/smarterwithgartner/the-irrational-exuberance-that-is-blockchain/>, July 17, 2018.

- Pointcarré, H. (1911). *La Valeur de la Science* [The Value of Science]. Paris: Flammarion.
- Polrot, S. (2017). *Smart-contract, ou le contrat auto-exécutant* [Smart-contract or the self-enforcing contract]. Retrieved from <https://www.ethereum-france.com/smart-contract-ou-le-contrat-auto-executant/>, July 3, 2018.
- PriceWaterCooper. (2015). The sharing economy. *Consumers Intelligence Series*. Retrieved from https://www.pwc.fr/fr/assets/files/pdf/2015/05/pwc_etude_sharing_economy.pdf, July 3, 2018.
- Ramachandiran, R. (2018). *Using Blockchain Technology to Improve Trust in eCommerce Reviews*. doi:10.13140/RG.2.2.29324.00646.
- Ridings, C. M., Gefen, D., & Arinze, B. (2002). Some antecedents and effects of trust in virtual communities. *The Journal of Strategic Information Systems*, 11(3), 271-295. doi:10.1016/S0963-8687(02)00021-5.
- Rifkin, J. (2000). *The Age Of Access: The New Culture of Hypercapitalism, Where All of Life is a Paid-For Experience*. New-york, NY: Putnam Publishing Group.
- Rifkin, J. (2014). *The Zero Marginal Cost Society: The Internet of Things, the Collaborative Commons, and the Eclipse of Capitalism*. New-York, USA: Palgrave Macmillan.
- Rogers, E.M. (2003). *Diffusion of Innovation* (5th ed.). New-York, NY: The Free Press.
- Sahlins, M. (1972). *Stone age economics*. Chicago, MI: Aldine-Atherton.
- Scholdan, L., & van Straaten, N. (2015). *What are the drivers of the sharing economy and how do they change the customer behaviour?*. Retrieved from <https://www.contextuallearning.nl/wp-content/uploads/2016/01/drivers-of-the-sharing-economy-strategie.pdf>, July 3, 2018.
- Schor, J. (2010). *Plenitude: The new economics of true wealth*. New York: Penguin Press.
- Schor, J. (2014). *Debating the sharing economy*. Retrieved from <http://www.greattransition.org/publication/debating-the-sharing-economy>, July 5, 2018.
- Selloni, D. (2017). New Forms of Economies: Sharing Economy, Collaborative Consumption, Peer-to-Peer Economy. *CoDesign for Public-Interest Services*, 15-26. Cham: Springer International Publishing.
- Sitkin, S., & Pablo, A. (1992). Reconceptualizing the Determinants of Trust. *The Academy of Management Review*, 17(1), 9-38. doi:10.2307/258646.
- Slobodnik, J. (2018). *How Oracles connect Smart Contracts to the real world*. Retrieved from <https://medium.com/bethereum/how-oracles-connect-smart-contracts-to-the-real-world-a56d3ed6a507>, June 28, 2018.
- Smith, A. (2016). *Shared, Collaborative and On Demand: the New Digital Economy*. Retrieved from <http://www.pewinternet.org/2016/05/19/the-new-digital-economy/>, June 24, 2018.

Smyth, R., & Johnson, A. (n.d.). *Factor Analysis*. Retrieved from <https://www.uwo.ca/fhs/tc/labs/10.FactorAnalysis.pdf>, July 14, 2018.

Stanoevska-Slabeva, K., Lenz-Kesekamp, V., & Suter, V. (2017). Platforms and the Sharing Economy: An Analysis. *EUH2020 Research Project PS2Share: Participation, Privacy and Power in the Sharing Economy*. doi:10.2139/ssrn.3102184.

Sundararajan, A. (2016). *The Sharing Economy: The End of Employment and the Rise of Crowd-Based Capitalism*. Cambridge, MA: MIT Press.

Tapscott, D., & Tapscott, A. (2016). *Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business and the World*. New-York, NY : Portfolio/Penguin.

Tay, L., & Jebb, A. (2017). Scale Development. In Rogelbert, S. (Eds), *SAGE Encyclopedia of Industrial and Organizational Psychology*. Thousand Oaks, CA: Sage.

The Economist. (2015). *The Great Chain of Being Sure About Things*. Retrieved from <https://www.economist.com/briefing/2015/10/31/the-great-chain-of-being-sure-about-things>, July 5, 2018.

Thrift, N. (2005). *Knowing Capitalism*. New Delhi: Sage Publication.

Thompson, C. (2016). *Private Blockchain or Database?*. Retrieved from <https://medium.com/blockchain-review/private-blockchain-or-database-whats-the-difference-523e7d42edc>, July 4, 2018.

Tumasjan, A., & Beutel, T. (Forthcoming). Blockchain-Based Decentralized Business Models in the Sharing Economy: A Technology Adoption Perspective. In H. Treiblmaier & R. Beck (Eds.), *Business Transformation through Blockchain*. Cham, Switzerland: Palgrave Macmillan.

Van de Glind, P. (2013). *The consumer potential of Collaborative Consumption* (Master's thesis) Utrecht University, Utrecht. Retrieved from <https://dspace.library.uu.nl/handle/1874/280661>, July 5, 2018.

Vaughan, R., & Daverio, R. (2016). *Assessing the size and presence of the collaborative economy in Europe*. Retrieved from <https://publications.europa.eu/en/publication-detail/-/publication/2acb7619-b544-11e7-837e-01aa75ed71a1>, July 3, 2018.

Walker, M. (2017). *Hype Cycle for Emerging Technologies 2017*. Retrieved from <https://www.gartner.com/doc/3768572/hype-cycle-emerging-technologies>, July 23, 2018.

Walsh, B. (2011). Today's Smart Choice: Don't Own. Share. *TIME*. Retrieved from http://content.time.com/time/specials/packages/article/0,28804,2059521_2059717_2059710,00.html, June 28, 2018.

Weber, T. A. (2014). Intermediation in a Sharing Economy: Insurance, Moral Hazard, and Rent Extraction. *Journal of Management Information Systems*, 31(3), 35–71.

Williamson, O. (1993). Calculativeness, Trust, and Economic Organization. *Journal of Law and Economics*, 36(1), 453-486.

Xu, X., Pautasso, C., Zhu, L., Gramoli, V., Ponomarev, A., Tran, B., & Chen, S. (2016). *The Blockchain as a Software Connector*. Paper presented at the 13th Working IEEE/IFIP Conference on Software Architecture, Venice. Retrieved from https://www.researchgate.net/publication/305525271_The_Blockchain_as_a_Software_Connector, July 13, 2018.

Zacharia, G., Moukas, A., & Maes, P. (2000). Collaborative reputation mechanisms for electronic marketplaces. *Decision Support Systems*, 29(4), 371-388. doi:10.1016/S0167-9236(00)00084-1.

H. Appendices

Exhibit A – Visual representation of the classification of the Sharing Economy (Grybaitė & Stankevičienė, 2016)

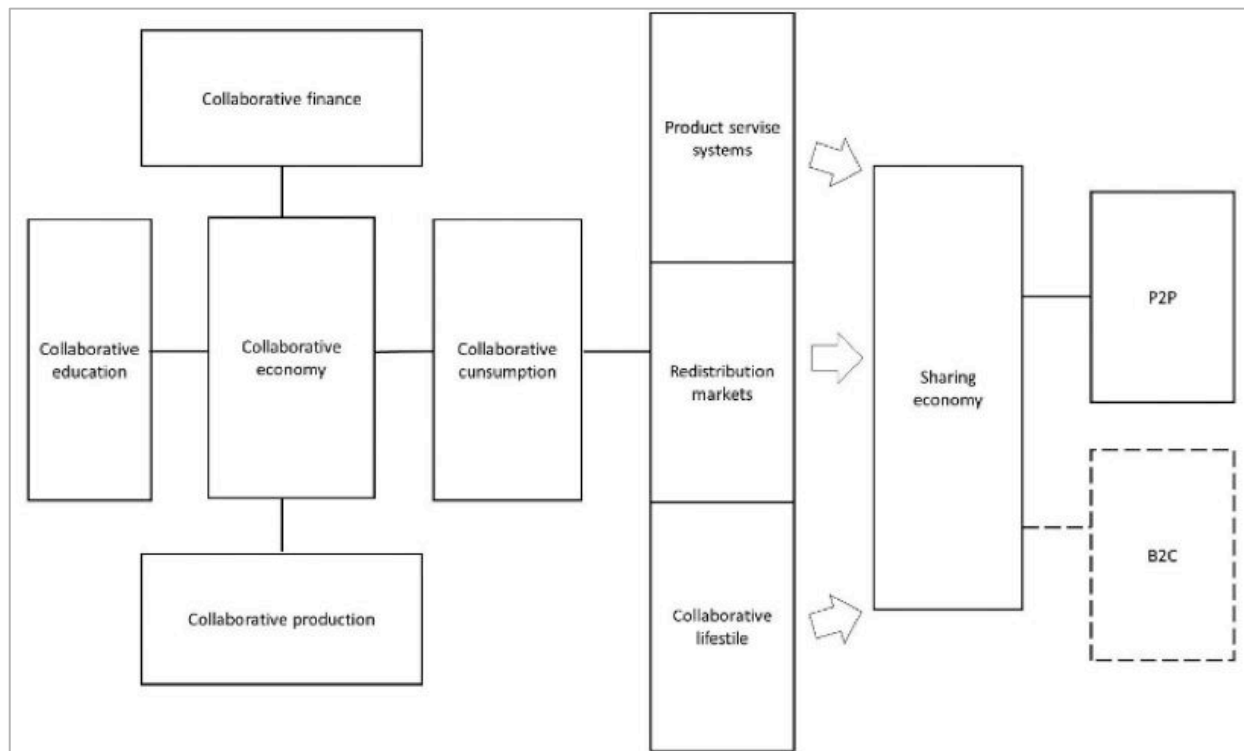


Exhibit B – Research model of trust within online peer-to-peer sharing environment (Hawlitsek, Teubner & Weinhardt, 2016)

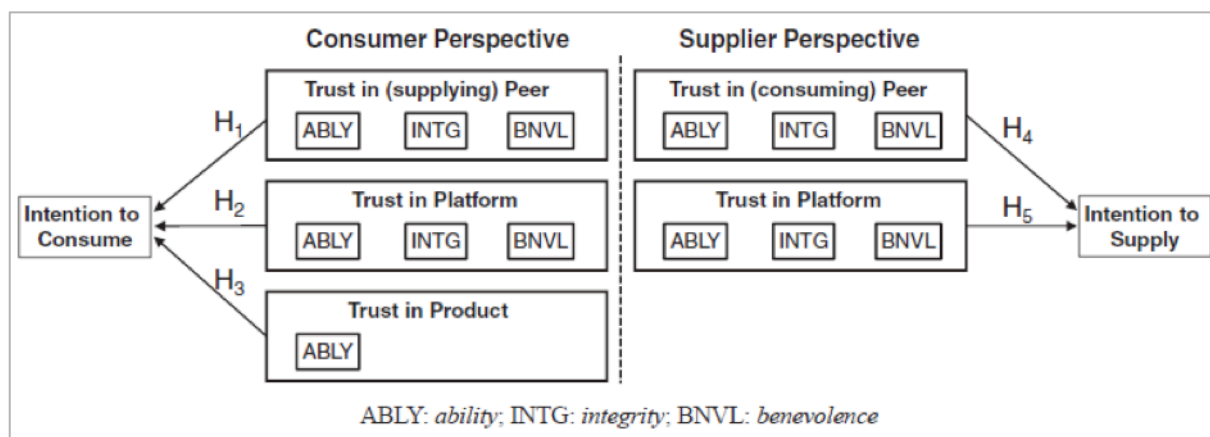


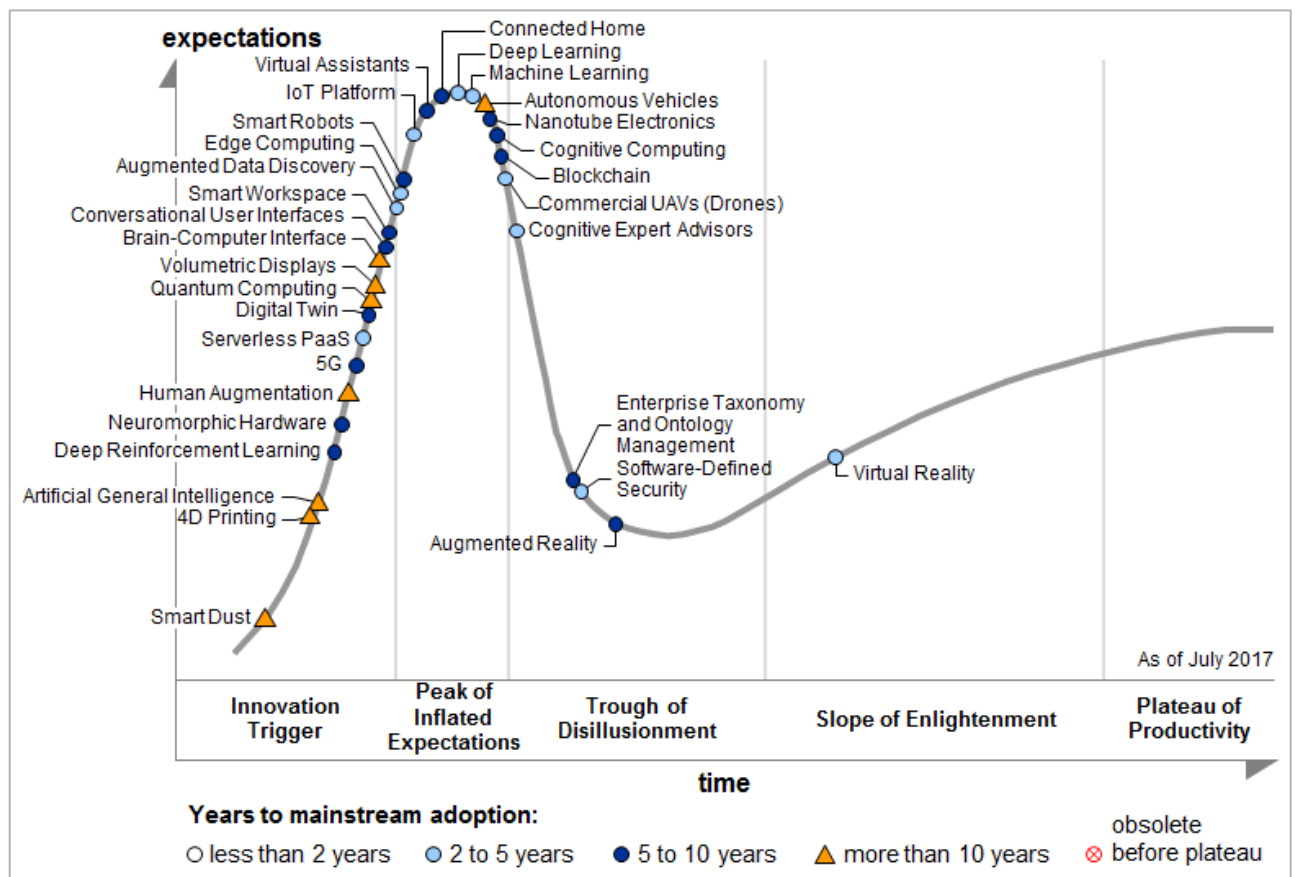
Exhibit C – Gartner Hype Cycle for Emerging Technologies 2017 (Panetta, 2017).

Exhibit D.1 - Summary table of the items, constructs and descriptive statistics of the obtainer's perspective.

Construct	Items	References	Mean	St. D.	Cro. Alpha
Obtainer Perspective					
Intention to Obtain					0,92
	J'envisagerais de louer un hébergement via BlockBnb	O.CON.1	4,58	1,23	
	Je louerais probablement un hébergement via BlockBnb	O.CON.2	4,27	1,26	
	Je louerais certainement un hébergement via BlockBnb	O.CON.3	3,68	1,41	
Trust in supplying peer's ability (Le propriétaire ...)					0,78
	...est apte à me louer un hébergement de qualité	O.PE.ABL.1	5,30	1,11	
	...est fiable et sérieux	O.PE.ABL.2	4,68	1,17	
	...est expérimenté	O.PE.ABL.3	4,30	1,19	
Trust in supplying peer's integrity (Le propriétaire ...)					0,9
	...est fiable et sérieux	O.PE.INT.1	4,68	1,18	
	...est honnête	O.PE.INT.2	4,66	1,11	
	...tient parole	O.PE.INT.3	4,73	1,17	
Trust in supplying peer's benevolence (Le propriétaire...)					0,87
	...tient compte de mes intérêts en tant que locataire	O.PE.BNV.1	4,79	1,26	
	...se soucie de mon bien-être	O.PE.BNV.2	4,71	1,20	
	...a de bonnes intentions à mon égard	O.PE.BNV.3	4,80	1,09	
Trust in platform's ability (BlockBnb...)					0,86
	...est compétent dans la gestion de ses locations	O.PF.ABL.1	5,18	1,19	
	...est capable de satisfaire mes besoins en tant que locataire	O.PF.ABL.2	5,38	1,11	
	...est qualifié pour m'offrir un service de location de qualité	O.PF.ABL.3	5,11	1,24	
Trust in platform's integrity (BlockBnb...)					0,82
	Les déclarations de BlockBnb sont fiables	O.PF.INT.1	5,14	1,22	
	...est transparent dans la gestion de sa plateforme et de mes données	O.PF.INT.2	5,24	1,37	
	...est une plateforme de location sérieuse	O.PF.INT.3	5,21	1,15	
Trust in platform's benevolence (BlockBnb...)					0,81
	...tient compte de mes intérêts en tant que locataire	O.PF.BNV.1	5,27	1,16	
	...se soucie de mon bien-être	O.PF.BNV.2	5,09	1,16	
	...n'a pas de mauvaises intentions vis-à-vis des locataires	O.PF.BNV.3	5,67	1,06	
Trust in product's ability (Les hébergement:					0,77
	...conviennent à mon séjour	O.PR.ABL.1	5,21	1,14	
	...ne vont pas me réserver de mauvaises surprises	O.PR.ABL.2	4,17	1,38	
	...répondent à mes besoins	O.PR.ABL.3	5,08	1,15	
Trust in miner's ability (Les mineurs...)					0,86
	...sont capables de vérifier et valider les informations que j'envoie	O.MI.ABL.1	4,85	1,44	
	...sont compétents et savent ce qu'il font	O.MI.ABL.2	4,35	1,42	
	...sont expérimentés	O.MI.ABL.3	4,08	1,43	
Trust in miner's integrity (Les mineurs...)					0,81
	...sont fiables et sérieux	O.MI.INT.1	4,39	1,29	
	...sont honnêtes	O.MI.INT.2	4,56	1,19	
	...valident les informations sans faire de favoritisme	O.MI.INT.3	4,61	1,29	
Trust in miner's benevolence (Les mineurs...)					0,89
	...se soucient de la qualité de l'expérience des locataires	O.MI.BNV.1	4,63	1,35	
	...tiennent compte des intérêts des locataires	O.MI.BNV.2	4,51	1,29	
	...ont de bonnes intentions à l'égard des locataires	O.MI.BNV.3	4,73	1,19	
Trust in arbitre's ability (Les arbitres...)					0,91
	...sont aptes à juger en cas de conflit	O.AR.ABL.1	4,40	1,56	
	...savent ce qu'ils font	O.AR.ABL.2	4,11	1,51	
	...sont expérimentés	O.AR.ABL.3	3,93	1,45	
Trust in arbitre's integrity (Les arbitres...)					0,85
	...sont neutres	O.AR.INT.1	4,43	1,50	
	...sont honnêtes	O.AR.INT.2	4,66	1,20	
	...sont fiables et sérieux	O.AR.INT.3	4,40	1,27	
Trust in arbitre's benevolence (Les arbitres...)					0,83
	...tiennent compte des intérêts des locataires	O.AR.BNV.1	4,65	1,36	
	...ont de bonnes intentions à l'égard des locataires	O.AR.BNV.2	4,69	1,26	
	...veulent un traitement juste pour tous les utilisateurs	O.AR.BNV.3	5,14	1,23	

Exhibit D.2 - Summary table of the items, constructs and descriptive statistics of the provider's perspective.

Construct	Items	Codes	Mean	St. D.	Cro. Alpha
Supplier Perspective					
Intention to Provide					0,95
	J'envisagerais de proposer un hébergement en location via BlockBnb	P.CON.1	4,33	1,32	
	Je proposerais probablement un hébergement en location via BlockBnb	P.CON.2	4,01	1,35	
	Je proposerais certainement un hébergement en location via BlockBnb	P.CON.3	3,58	1,45	
Trust in peer's ability					0,84
(Le locataire...)	...est apte à prendre soin de mon hébergement	P.PE.ABL.1	4,68	1,29	
	...est expérimenté	P.PE.ABL.2	4,30	1,14	
	...sait ce qu'il fait	P.PE.ABL.3	4,45	1,27	
Trust in peer's integrity					0,92
(Le locataire...)	...est fiable et sérieux	P.PE.INT.1	4,46	1,13	
	...est honnête	P.PE.INT.2	4,48	1,12	
	...tient parole	P.PE.INT.3	4,47	1,06	
Trust in peer's benevolence					0,8
(Le locataire...)	...tient compte de mes intérêts en tant que propriétaire	P.PE.BNV.1	4,01	1,32	
	...se soucie de garder mon hébergement en bon état	P.PE.BNV.2	4,74	1,11	
	...a de bonnes intentions à mon égard	P.PE.BNV.3	4,57	1,05	
Trust in platform's ability					0,91
(BlockBnb...)	...est compétent dans la gestion de ses locations	P.PF.ABL.1	5,13	1,15	
	...est capable de satisfaire mes besoins en tant que propriétaire	P.PF.ABL.2	5,26	1,12	
	...est qualifié pour une bonne gestion de mes locations	P.PF.ABL.3	5,04	1,22	
Trust in platform's integrity					0,88
(BlockBnb...)	Les déclarations de BlockBnb sont fiables	P.PF.INT.1	5,13	1,14	
	...est transparent dans la gestion de sa plateforme et de la mise à disposition de mes hébergements	P.PF.INT.2	5,35	1,17	
	...est une plateforme de location sérieuse	P.PF.INT.3	5,17	1,15	
Trust in platform's benevolence					0,81
(BlockBnb...)	...tient compte de mes intérêts en tant que propriétaire	P.PF.BNV.1	5,20	1,09	
	...se soucie de mon bien-être en tant que propriétaire	P.PF.BNV.2	4,87	1,06	
	...n'a pas de mauvaises intentions vis-à-vis des propriétaires	P.PF.BNV.3	5,51	1,03	
Trust in miner's ability					0,86
(Les mineurs...)	...sont capables de vérifier et valider les informations que j'envoie	P.MI.ABL.1	4,84	1,25	
	...sont capables de ce qu'ils font	P.MI.ABL.2	4,39	1,22	
	...sont expérimentés	P.MI.ABL.3	4,06	1,19	
Trust in miner's integrity					0,8
(Les mineurs...)	...sont fiables et sérieux	P.MI.INT.1	4,32	1,16	
	...sont honnêtes	P.MI.INT.2	4,57	1,08	
	...valident les informations sans faire de favoritisme	P.MI.INT.3	4,60	1,19	
Trust in miner's benevolence					0,92
(Les mineurs...)	...se soucient de la qualité de l'expérience des propriétaires	P.MI.BNV.1	4,66	1,24	
	...tiennent compte des intérêts des propriétaires	P.MI.BNV.2	4,51	1,18	
	...ont de bonnes intentions à l'égard des propriétaires	P.MI.BNV.3	4,58	1,19	
Trust in arbitre's ability					0,9
(Les arbitres...)	...sont aptes à juger en cas de conflit	P.AR.ABL.1	4,42	1,40	
	...savent ce qu'ils font	P.AR.ABL.2	4,24	1,39	
	...sont expérimentés	P.AR.ABL.3	3,97	1,34	
Trust in arbitre's integrity					0,86
(Les arbitres...)	...sont neutres	P.AR.INT.1	4,57	1,29	
	...sont honnêtes	P.AR.INT.2	4,62	1,14	
	...sont fiables et sérieux	P.AR.INT.3	4,36	1,24	
Trust in arbitre's benevolence					0,81
(Les arbitres...)	...tiennent compte des intérêts des propriétaires	P.AR.BNV.1	4,51	1,24	
	...ont de bonnes intentions à l'égard des propriétaires	P.AR.BNV.2	4,59	1,15	
	...veulent un traitement juste pour tous les utilisateurs	P.AR.BNV.3	5,13	1,23	

Exhibit E.1 – Transcript of the first page of the questionnaire used.**Page 1 - Bienvenue & merci pour votre participation!**

Dans le cadre de mon travail de fin d'étude, je réalise une enquête sur l'application de la technologie de la Blockchain dans les secteurs d'économie collaborative. Le but de ce questionnaire est de déterminer les facteurs interpersonnels significatifs dans la décision individuelle de participation à une application de type Uber, AirBnb ou eBay construite sur une Blockchain. Je m'intéresse plus particulièrement à la question de la confiance que les utilisateurs ont envers les différents acteurs de l'écosystème et du rôle qu'elle joue dans leurs intentions de participation ou de non-participation.

Il n'est pas du tout nécessaire de connaître le fonctionnement de la Blockchain pour participer à cette enquête. Répondre à ce questionnaire vous prendra entre 15 et 20 minutes. Il est important de répondre à toutes les questions en une fois (le questionnaire comporte 6 pages en tout), pour garantir la validité des résultats, et de réaliser le questionnaire dans un endroit calme où il est possible de rester concentré.

Ce questionnaire comporte 4 grandes parties:

1. Explication et mise en situation: la présentation d'une application de type AirBnb construite sur une Blockchain, que j'ai appelée BlockBnb, ainsi que l'explication de son fonctionnement. Cette partie vous servira à visualiser une situation dans laquelle vous êtes un utilisateur potentiel de BlockBnb.
2. Perspective du locataire: La première série de questions portent sur votre opinion en tant que locataire d'un hébergement. Il s'agit de vous projeter en tant que locataire utilisant BlockBnb et de réagir spontanément à une liste d'affirmations concernant les acteurs de la plateforme.
3. Perspective du propriétaire: La deuxième série de questions portent sur votre opinion en tant que propriétaire d'un hébergement mis en location. Cette fois, il s'agit de vous projeter en tant que propriétaire utilisant BlockBnb et de réagir spontanément à une liste d'affirmations concernant les acteurs de la plateforme.
4. Informations personnelles supplémentaires: La dernière série de questions porte sur vos informations personnelles (qui resteront anonymes) qui me permettront de mettre en perspective les résultats de l'enquête.

Merci de lire attentivement l'explication et la mise en situation afin de vous aider à vous projeter dans les questions. Pour vous aider, cette partie restera à votre disposition à la fin de chaque page de questions.

Important: Vous avez la possibilité de changer vos réponses durant tout le questionnaire, mais vous devez cliquer sur "Suivant" pour enregistrer vos réponses sur la page avant de pouvoir revenir en arrière. Si vous ne le faites pas, vos réponses sur la page seront effacées.

À la fin de ce questionnaire, vous aurez également la possibilité de participer à un concours vous permettant de gagner deux Bongos d'une valeur de 25 euros chacun!

Les derniers résultats de l'enquête seront collectés le dimanche 22 juillet à 22:00. Merci de réaliser le questionnaire avant cette date afin que vos réponses puissent être prises en compte.

Pour toute question relative au questionnaire et à l'enquête en général, vous pouvez me contacter à l'adresse email suivante: art.maistriaux@gmail.com.

Merci pour votre aide et votre temps.

Exhibit E.2 – Transcript of the second page of the questionnaire used.

Page 2 - Explication et mise en situation

BlockBnb est une plateforme de location d'hébergement entre particuliers similaire à AirBnb. Sa particularité est d'être construite sur une **Blockchain**, la technologie qui est derrière le Bitcoin. Le principe de la Blockchain est de décentraliser la gestion des données et des transactions de façon transparente et sécurisée.

Sur une Blockchain, les actions sont automatisées par des algorithmes, ce qui limite le besoin d'intervention humaine. Le code de la Blockchain, qui contient ces algorithmes, est créé par les fondateurs de BlockBnb et peut être examiné par tous les utilisateurs. Chaque mise à jour du code proposé par les fondateurs doit être acceptée par la majorité des utilisateurs avant d'être mise en place.

Comme toute Blockchain, BlockBnb possède une monnaie exclusivement utilisée sur sa plateforme : le TokenBnb. Les utilisateurs peuvent acheter et vendre des **TokenBnb** contre des euros auprès de BlockBnb ou d'autres utilisateurs.

Les messages et les transactions se transmettent via les « **mineurs** ». Un mineur est un **valideur** dont le rôle est de vérifier les informations transmises et de les enregistrer sur la Blockchain grâce au travail de son ordinateur. Ces valideurs reçoivent des TokenBnb en échange de leurs efforts. Tous les utilisateurs de la plateforme peuvent devenir des valideurs en téléchargeant un simple programme sur leur ordinateur.

En se connectant sur BlockBnb, les locataires ont accès à une liste d'hébergements proposés, leur prix ainsi qu'au profil de leur propriétaire. Pour louer un hébergement, un locataire envoie une demande de réservation au propriétaire. Si le propriétaire accepte, le montant de location, plus la caution, est transféré sous forme de TokenBnb depuis le compte du locataire vers **un compte bloqué auquel ni le locataire ni le propriétaire ne peuvent avoir accès**. Lors du transfert, **une commission de 2% est prélevée par BlockBnb** afin de financer la maintenance et le développement de la plateforme.

À la fin du séjour, si celui-ci se passe bien pour les deux parties, le montant de location est automatiquement transféré vers le compte du propriétaire et la caution est reversée au locataire. Dans le cas d'un litige entre les deux individus, ceux-ci peuvent faire appel au **service de résolution de conflits de BlockBnb**. Le système sélectionne aléatoirement 5 personnes parmi la liste des arbitres. **Tous les utilisateurs peuvent s'inscrire en tant qu'arbitre** et sont rémunérés en TokenBnb pour leurs efforts. Le locataire et le propriétaire expliquent la situation et présentent leurs arguments respectifs de façon anonyme et indépendante aux 5 arbitres. **Ces derniers décident, également de façon anonyme et indépendante, de la partie en tort et de son degré de responsabilité**. Si le locataire est reconnu responsable d'une mauvaise utilisation de l'hébergement loué, une partie de sa caution est versée au propriétaire. Dans le cas où le propriétaire est reconnu responsable d'une faute, une partie du prix de location est reversé au locataire.

Après la clôture du paiement, le locataire et le propriétaire reçoivent tous les deux une invitation à évaluer leur expérience ainsi que l'autre utilisateur. **Le locataire évalue le propriétaire et le propriétaire évalue le locataire**. Cette note influencera leur **réputation** respective, qui sera visible par les autres utilisateurs de BlockBnb.

Exhibit E.3 – Transcript of the third page of the questionnaire used.**Page 3 - Perspective du locataire**

Imaginez-vous maintenant en tant que locataire utilisant BlockBnb.

Ci-dessous se trouve une série d'affirmations à propos des qualités des différents acteurs de BlockBnb. Vous devez exprimer votre avis par rapport à ces affirmations en choisissant parmi les propositions de réponse allant de "Pas du tout d'accord avec ..." à "Totalement d'accord avec...".

Attention! Votre réaction doit se baser sur votre perception intuitive de la situation qui se crée dans votre imaginaire en fonction des informations données. Ces informations servent de base pour votre projection, mais d'autres éléments personnels viendront probablement influencer ce scénario. Il n'y a donc pas de bonnes ni de mauvaises réponses.

Votre opinion peut donc être influencée par votre caractère, votre expérience et votre attitude. L'important est de vous projeter en tant que locataire utilisant BlockBnb et de réagir spontanément aux affirmations en fonction de la situation que vous vous imaginez.

L'explication et la mise en situation restent disponibles à la fin de cette page pour faciliter votre compréhension.

Je suis donc un **locataire d'hébergement**:

1. J'envisagerais de louer un hébergement via BlockBnb

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Un peu d'accord	D'accord	Totalement d'accord
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2. Je louerais probablement un hébergement via BlockBnb

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Un peu d'accord	D'accord	Totalement d'accord
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3. Je louerais certainement un hébergement via BlockBnb

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Un peu d'accord	D'accord	Totalement d'accord
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4. Le propriétaire est apte à me louer un hébergement de qualité

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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5. Le propriétaire est compétent et sait ce qu'il fait

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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6. Le propriétaire est expérimenté

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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7. Le propriétaire est fiable et sérieux

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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8. Le propriétaire est honnête

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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9. Le propriétaire tient parole

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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10. Le propriétaire tient compte de mes intérêts en tant que locataire

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Un peu d'accord	D'accord	Totalement d'accord
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11. Le propriétaire se soucie de mon bien-être

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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12. Le propriétaire a de bonnes intentions à mon égard

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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13. BlockBnb est compétent dans la gestion de ses locations

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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14. BlockBnb est capable de satisfaire mes besoins de locataire

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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15. BlockBnb est qualifié pour m'offrir un service de location de qualité

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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16. Les déclarations de BlockBnb sont fiables.

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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17. BlockBnb est transparent dans la gestion de sa plateforme et de mes données

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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18. BlockBnb est une plateforme de location sérieuse

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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19. BlockBnb tient compte de mes intérêts en tant que locataire

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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20. BlockBnb se soucie de mon bien-être

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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21. BlockBnb n'a pas de mauvaises intentions vis-à-vis des locataires

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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22. Les hébergements proposés par BlockBnb conviennent pour mon séjour

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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23. Les hébergements proposés par BlockBnb ne vont pas me réserver de mauvaises surprises

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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24. Les hébergements proposés par BlockBnb répondent à mes besoins

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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25. Les "mineurs" (valideurs) sont capables de vérifier et valider les informations que j'envoie

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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26. Les "mineurs" (valideurs) sont compétents et savent ce qu'il font

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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27. Les "mineurs" (valideurs) sont expérimentés

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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28. Les "mineurs" (valideurs) sont fiables et sérieux

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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29. Les "mineurs" (valideurs) sont honnêtes

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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30. Les "mineurs" (valideurs) valident les informations sans faire de favoritisme

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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31. Les "mineurs" (valideurs) se soucient de la qualité de l'expérience des locataires avec BlockBnb

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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32. Les "mineurs" (valideurs) tiennent compte des intérêts des locataires

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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33. Les "mineurs" (valideurs) ont de bonnes intentions à l'égard des locataires

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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34. Les arbitres sont aptes à juger en cas de conflit

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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35. Les arbitres sont compétents et savent ce qu'ils font

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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36. Les arbitres sont expérimentés

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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37. Les arbitres sont neutres

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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38. Les arbitres sont honnêtes

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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39. Les arbitres sont fiables et sérieux

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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40. Les arbitres tiennent compte des intérêts des locataires

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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41. Les arbitres ont de bonnes intentions à l'égard des locataires

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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42. Les arbitres veulent un traitement juste pour tous les utilisateurs de BlockBnb

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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Rappel - Explication et mise en situation

BlockBnb est une plateforme de location d'hébergement entre particuliers similaire à AirBnb. Sa particularité est d'être construite sur une **Blockchain**, la technologie qui est derrière le Bitcoin. Le principe de la Blockchain est de décentraliser la gestion des données et des transactions de façon transparente et sécurisée.

Sur une Blockchain, les actions sont automatisées par des algorithmes, ce qui limite le besoin d'intervention humaine. Le code de la Blockchain, qui contient ces algorithmes, est créé par les fondateurs de BlockBnb et peut être examiné par tous les utilisateurs. Chaque mise à jour du code proposé par les fondateurs doit être acceptée par la majorité des utilisateurs avant d'être mise en place.

Comme toute Blockchain, BlockBnb possède une monnaie exclusivement utilisée sur sa plateforme : le TokenBnb. Les utilisateurs peuvent acheter et vendre des **TokenBnb** contre des euros auprès de BlockBnb ou d'autres utilisateurs.

Les messages et les transactions se transmettent via les « **mineurs** ». Un mineur est un **valideur** dont le rôle est de vérifier les informations transmises et de les enregistrer sur la Blockchain grâce au travail de son ordinateur. Ces valideurs reçoivent des TokenBnb en échange de leurs efforts. Tous les utilisateurs de la plateforme peuvent devenir des valideurs en téléchargeant un simple programme sur leur ordinateur.

En se connectant sur BlockBnb, les locataires ont accès à une liste d'hébergements proposés, leur prix ainsi qu'au profil de leur propriétaire. Pour louer un hébergement, un locataire envoie une demande de réservation au

propriétaire. Si le propriétaire accepte, le montant de location, plus la caution, est transféré sous forme de TokenBnb depuis le compte du locataire vers **un compte bloqué auquel ni le locataire ni le propriétaire ne peuvent avoir accès**. Lors du transfert, **une commission de 2% est prélevée par BlockBnb** afin de financer la maintenance et le développement de la plateforme.

À la fin du séjour, si celui-ci se passe bien pour les deux parties, le montant de location est automatiquement transféré vers le compte du propriétaire et la caution est reversée au locataire. Dans le cas d'un litige entre les deux individus, ceux-ci peuvent faire appel au **service de résolution de conflits de BlockBnb**. Le système sélectionne aléatoirement 5 personnes parmi la liste des arbitres. **Tous les utilisateurs peuvent s'inscrire en tant qu'arbitre** et sont rémunérés en TokenBnb pour leurs efforts. Le locataire et le propriétaire expliquent la situation et présentent leurs arguments respectifs de façon anonyme et indépendante aux 5 arbitres. **Ces derniers décident, également de façon anonyme et indépendante, de la partie en tort et de son degré de responsabilité**. Si le locataire est reconnu responsable d'une mauvaise utilisation de l'hébergement loué, une partie de sa caution est versée au propriétaire. Dans le cas où le propriétaire est reconnu responsable d'une faute, une partie du prix de location est reversé au locataire.

Après la clôture du paiement, le locataire et le propriétaire reçoivent tous les deux une invitation à évaluer leur expérience ainsi que l'autre utilisateur. **Le locataire évalue le propriétaire et le propriétaire évalue le locataire**. Cette note influencera leur **réputation** respective, qui sera visible par les autres utilisateurs de BlockBnb.

Exhibit E.4 – Transcript of the fourth page of the questionnaire used.

Page 4 - Perspective du propriétaire

Imaginez-vous maintenant en tant que **propriétaire utilisant BlockBnb**.

Ci-dessous se trouve une série d'affirmations à propos des qualités des différents acteurs de BlockBnb. Vous devez exprimer votre avis par rapport à ces affirmations en choisissant parmi les propositions de réponse allant de "Pas du tout d'accord avec ..." à "Totalelement d'accord avec..."

Attention! Votre réaction doit se baser sur votre perception intuitive de la situation qui se crée dans votre imaginaire en fonction des informations données. Ces informations servent de base pour votre projection, mais d'autres éléments personnels viendront probablement influencer ce scénario. Il n'y a donc pas de bonnes ni de mauvaises réponses.

Votre opinion peut donc être influencée par votre caractère, votre expérience et votre attitude. L'important est de vous projeter en tant que propriétaire utilisant BlockBnb et de réagir spontanément aux affirmations en fonction de la situation que vous vous imaginez.

L'explication et la mise en situation restent disponibles à la fin de cette page pour faciliter votre compréhension.

Je suis donc un **propriétaire d'hébergement**:

1. J'envisagerais de proposer un hébergement en location via BlockBnb

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Un peu d'accord	D'accord	Totalelement d'accord
----------------------	--------------	--------------------------	-----------------	----------	-----------------------

2. Je proposerais probablement un hébergement en location via BlockBnb

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Un peu d'accord	D'accord	Totalelement d'accord
----------------------	--------------	--------------------------	-----------------	----------	-----------------------

3. Je proposerais certainement un hébergement en location via BlockBnb

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Un peu d'accord	D'accord	Totalelement d'accord
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4. Le locataire est apte à prendre soin de mon hébergement

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalelement d'accord
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5. Le locataire est compétent

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalelement d'accord
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6. Le locataire sait ce qu'il fait

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalelement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	-----------------------

7. Le locataire est fiable et sérieux

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalelement d'accord
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8. Le locataire est honnête

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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9. Le locataire tient parole

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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10. Le locataire tient compte de mes intérêts en tant que propriétaire

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Un peu d'accord	D'accord	Totalement d'accord
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11. Le locataire se soucie de garder mon hébergement en bon état

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	---------------------

12. Le locataire a de bonnes intentions à mon égard

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	---------------------

13. BlockBnb est compétent dans la gestion de ses locations

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	---------------------

14. BlockBnb est capable de satisfaire mes besoins en tant que propriétaires

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	---------------------

15. BlockBnb est qualifié pour une bonne gestion de mes locations

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	---------------------

16. Les déclarations de BlockBnb sont fiables

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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17. BlockBnb est transparent dans la gestion de sa plateforme et de la mise à disposition de mes hébergements

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	---------------------

18. BlockBnb est une plateforme de location sérieuse

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	---------------------

19. BlockBnb tient compte de mes intérêts en tant que propriétaire

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	---------------------

20. BlockBnb se soucie de mon bien-être en tant que propriétaire

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	---------------------

21. BlockBnb n'a pas de mauvaises intentions vis-à-vis des propriétaires

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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22. Les "mineurs" (valideurs) sont capables de vérifier et valider les informations que j'envoie

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	---------------------

23. Les "mineurs" (valideurs) sont compétents et savent ce qu'il font

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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24. Les "mineurs" (valideurs) sont expérimentés

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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25. Les "mineurs" (valideurs) sont fiables et sérieux

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	---------------------

26. Les "mineurs" (valideurs) sont honnêtes

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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27. Les "mineurs" (valideurs) valident les informations sans faire de favoritisme

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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28. Les "mineurs" (valideurs) se soucient de la qualité de l'expérience des propriétaires sur BlockBnb

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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29. Les "mineurs" (valideurs) tiennent compte des intérêts des propriétaires

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	---------------------

30. Les "mineurs" (valideurs) ont de bonnes intentions à l'égard des propriétaires

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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31. Les arbitres sont aptes à juger en cas de conflit

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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32. Les arbitres sont compétents et savent ce qu'ils font

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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33. Les arbitres sont expérimentés

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	---------------------

34. Les arbitres sont neutres

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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35. Les arbitres sont honnêtes

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
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36. Les arbitres sont fiables et sérieux

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	---------------------

37. Les arbitres tiennent compte des intérêts des propriétaires

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	---------------------

38. Les arbitres ont de bonnes intentions à l'égard des propriétaires

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	---------------------

39. Les arbitres veulent un traitement juste pour tous les utilisateurs de BlockBnb

Pas du tout d'accord	Pas d'accord	Pas tout à fait d'accord	Pas d'avis	Un peu d'accord	D'accord	Totalement d'accord
----------------------	--------------	--------------------------	------------	-----------------	----------	---------------------

Rappel - Explication et mise en situation

BlockBnb est une plateforme de location d'hébergement entre particuliers similaire à AirBnb. Sa particularité est d'être construite sur une **Blockchain**, la technologie qui est derrière le Bitcoin. Le principe de la Blockchain est de décentraliser la gestion des données et des transactions de façon transparente et sécurisée.

Sur une Blockchain, les actions sont automatisées par des algorithmes, ce qui limite le besoin d'intervention humaine. Le code de la Blockchain, qui contient ces algorithmes, est créé par les fondateurs de BlockBnb et peut être examiné par tous les utilisateurs. Chaque mise à jour du code proposé par les fondateurs doit être acceptée par la majorité des utilisateurs avant d'être mise en place.

Comme toute Blockchain, BlockBnb possède une monnaie exclusivement utilisée sur sa plateforme : le TokenBnb. Les utilisateurs peuvent acheter et vendre des **TokenBnb** contre des euros auprès de BlockBnb ou d'autres utilisateurs.

Les messages et les transactions se transmettent via les « **mineurs** ». Un mineur est un **valideur** dont le rôle est de vérifier les informations transmises et de les enregistrer sur la Blockchain grâce au travail de son ordinateur. Ces valideurs reçoivent des TokenBnb en échange de leurs efforts. Tous les utilisateurs de la plateforme peuvent devenir des valideurs en téléchargeant un simple programme sur leur ordinateur.

En se connectant sur BlockBnb, les locataires ont accès à une liste d'hébergements proposés, leur prix ainsi qu'au profil de leur propriétaire. Pour louer un hébergement, un locataire envoie une demande de réservation au propriétaire. Si le propriétaire accepte, le montant de location, plus la caution, est transféré sous forme de TokenBnb depuis le compte du locataire vers **un compte bloqué auquel ni le locataire ni le propriétaire ne peuvent avoir accès**. Lors du transfert, **une commission de 2% est prélevée par BlockBnb** afin de financer la maintenance et le développement de la plateforme.

À la fin du séjour, si celui-ci se passe bien pour les deux parties, le montant de location est automatiquement transféré vers le compte du propriétaire et la caution est reversée au locataire. Dans le cas d'un litige entre les deux individus, ceux-ci peuvent faire appel au **service de résolution de conflits de BlockBnb**. Le système

sélectionne aléatoirement 5 personnes parmi la liste des arbitres. **Tous les utilisateurs peuvent s'inscrire en tant qu'arbitre** et sont rémunérés en TokenBnb pour leurs efforts. Le locataire et le propriétaire expliquent la situation et présentent leurs arguments respectifs de façon anonyme et indépendante aux 5 arbitres. **Ces derniers décident, également de façon anonyme et indépendante, de la partie en tort et de son degré de responsabilité.** Si le locataire est reconnu responsable d'une mauvaise utilisation de l'hébergement loué, une partie de sa caution est versée au propriétaire. Dans le cas où le propriétaire est reconnu responsable d'une faute, une partie du prix de location est reversé au locataire.

Après la clôture du paiement, le locataire et le propriétaire reçoivent tous les deux une invitation à évaluer leur expérience ainsi que l'autre utilisateur. **Le locataire évalue le propriétaire et le propriétaire évalue le locataire.** Cette note influencera leur **réputation** respective, qui sera visible par les autres utilisateurs de BlockBnb.

Exhibit E.5 – Transcript of the fifth page of the questionnaire used.**Page 5 - Informations personnelles supplémentaires**

Les informations récoltées ne serviront qu'à mettre en perspective les résultats de l'enquête et d'améliorer leur utilité scientifique.

1. Vous êtes un(e)

- ☐ Homme
- ☐ Femme

2. Veuillez sélectionner votre catégorie d'âge

- ☐ 12 -18
- ☐ 18 - 25
- ☐ 25 - 35
- ☐ 35 - 50
- ☐ 50 - 65
- ☐ 65 et +

3. Dans quel pays habitez-vous?

4. Comment décririez-vous votre attitude par rapport au risque?

Note: l'attitude au risque est la disposition à prendre des risques dans des situations inconnues ou incertaines.

	Je n'aime	Je n'aime	Je n'aime	Je n'aime	Je suis	Léger	Goût		Grand	Goût
Je déteste	pas du	pas le	généralement	pas trop le	neutre par	goût pour	modéré	Goût pour	goût pour	extrême
le risque	tout le	risque	pas le risque	risque	rapport au	le risque	pour le	le risque	le risque	pour le
	risque				risque		risque			risque

5. Avez-vous loué un hébergement sur Airbnb en tant que locataire? Si oui, combien de fois?

- ☐ Je n'ai jamais utilisé Airbnb en tant que locataire
- ☐ 1 - 3 fois
- ☐ 4 - 9 fois
- ☐ 10 et plus

6. Avez-vous déjà loué un hébergement sur Airbnb en tant que propriétaire? Si oui, combien de fois?

- ☐ Je n'ai jamais utilisé Airbnb en tant que propriétaire
- ☐ 1 - 3 fois
- ☐ 4 - 9 fois
- ☐ 10 et plus

7. Que savez-vous à propos de la technologie du Blockchain?

- ☐ Je n'en ai jamais entendu parler
- ☐ J'en ai déjà entendu parler, mais ne m'y intéresse pas

- Je m'y intéresse et je connais les grandes implications
- En plus des implications, je comprend le fonctionnement technique des concepts
- Je maîtrise la technologie Blockchain en tant que codeur/programmeur
- Autre (spécifier)

8. Avez-vous déjà utilisé une application qui utilise la Blockchain? Si oui, laquelle?

- Oui, et je le referai probablement
- Oui, mais je ne le referai probablement pas
- Non, mais j'aurais envie de le faire
- Non, et je n'aurais pas envie de le faire
- Je ne sais pas
- Type d'application(s) utilisée(s)

Exhibit E.6 – Transcript of the sixth page of the questionnaire used.**Page 6 - Participation au concours**

En réalisant ce questionnaire, vous avez la possibilité de participer à un concours pour tenter de gagner deux Bongos d'une valeur de 25 euros chacun! Les gagnants seront tirés au sort parmi les participants à la clôture de l'enquête et seront contactés d'ici le 10 août 2018.

1. Je souhaite participer au tirage au sort pour tenter de gagner un Bongo d'une valeur de 25 euros

- ☐ Oui
- ☐ Non

Pour participer à ce concours, merci de me communiquer votre adresse e-mail afin que je puisse vous contacter si vous êtes tiré au sort. Votre adresse ne servira qu'au concours et ne sera en aucun cas liée aux réponses du questionnaire.

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Exhibit F.1 – Visualisation of the scree plot generated for the obtainer's perspective in the Exploratory Factor Analysis.

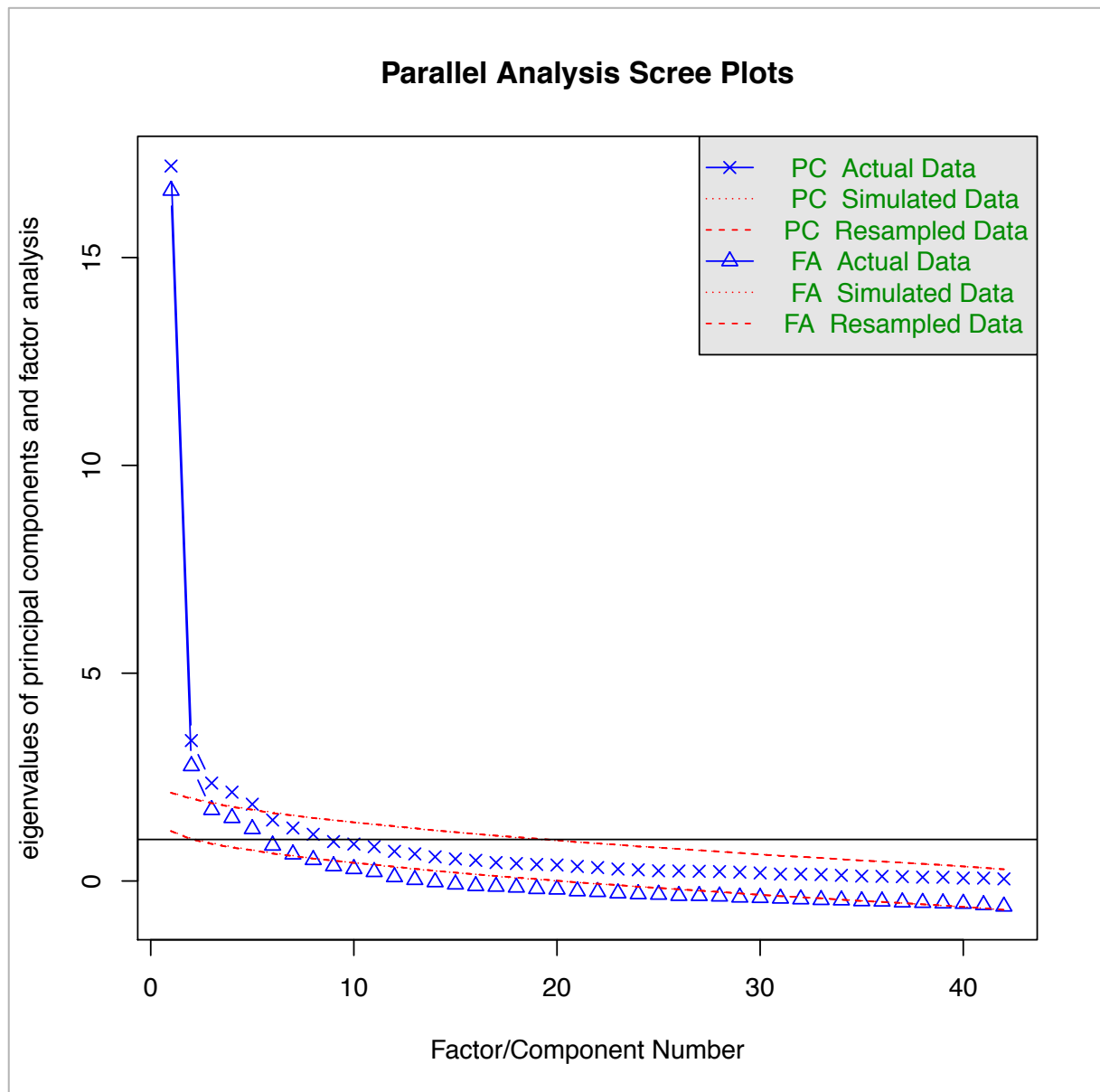


Exhibit F.2 – Visualisation of the scree plot generated for the obtainer’s perspective in the Exploratory Factor Analysis.

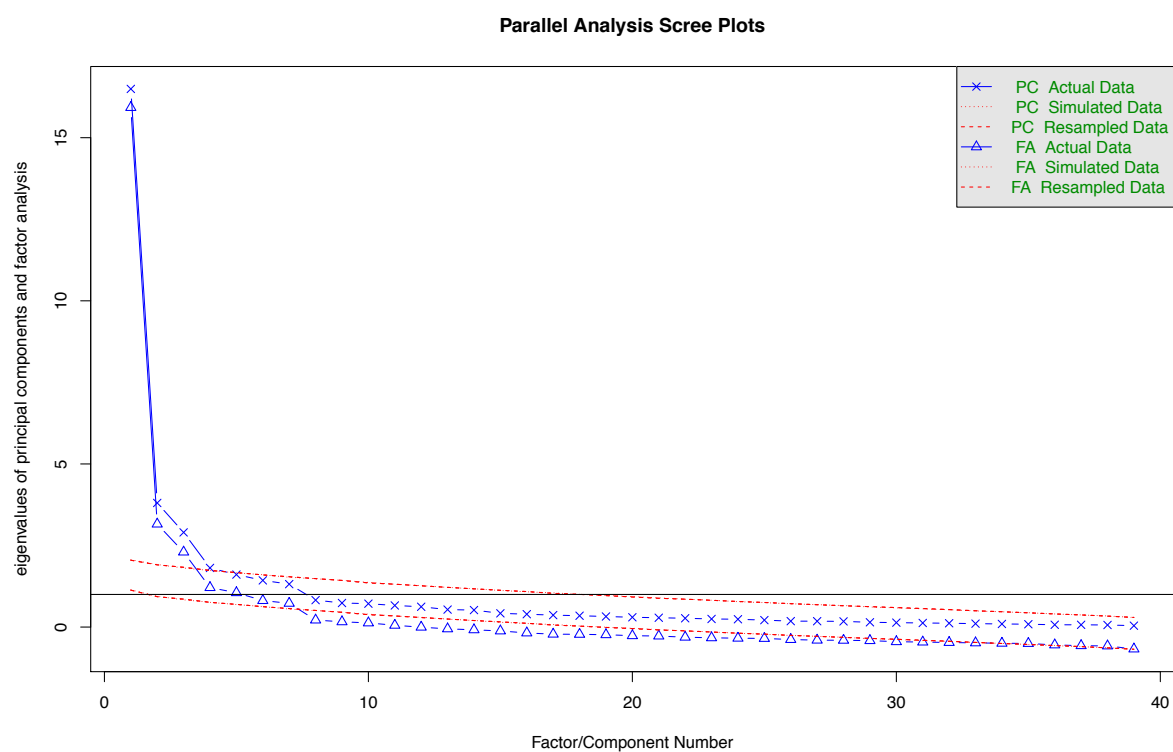


Exhibit G.1 – Visualisation of the structure of the factors from the parallel factor analysis for the obtainer's perspective.

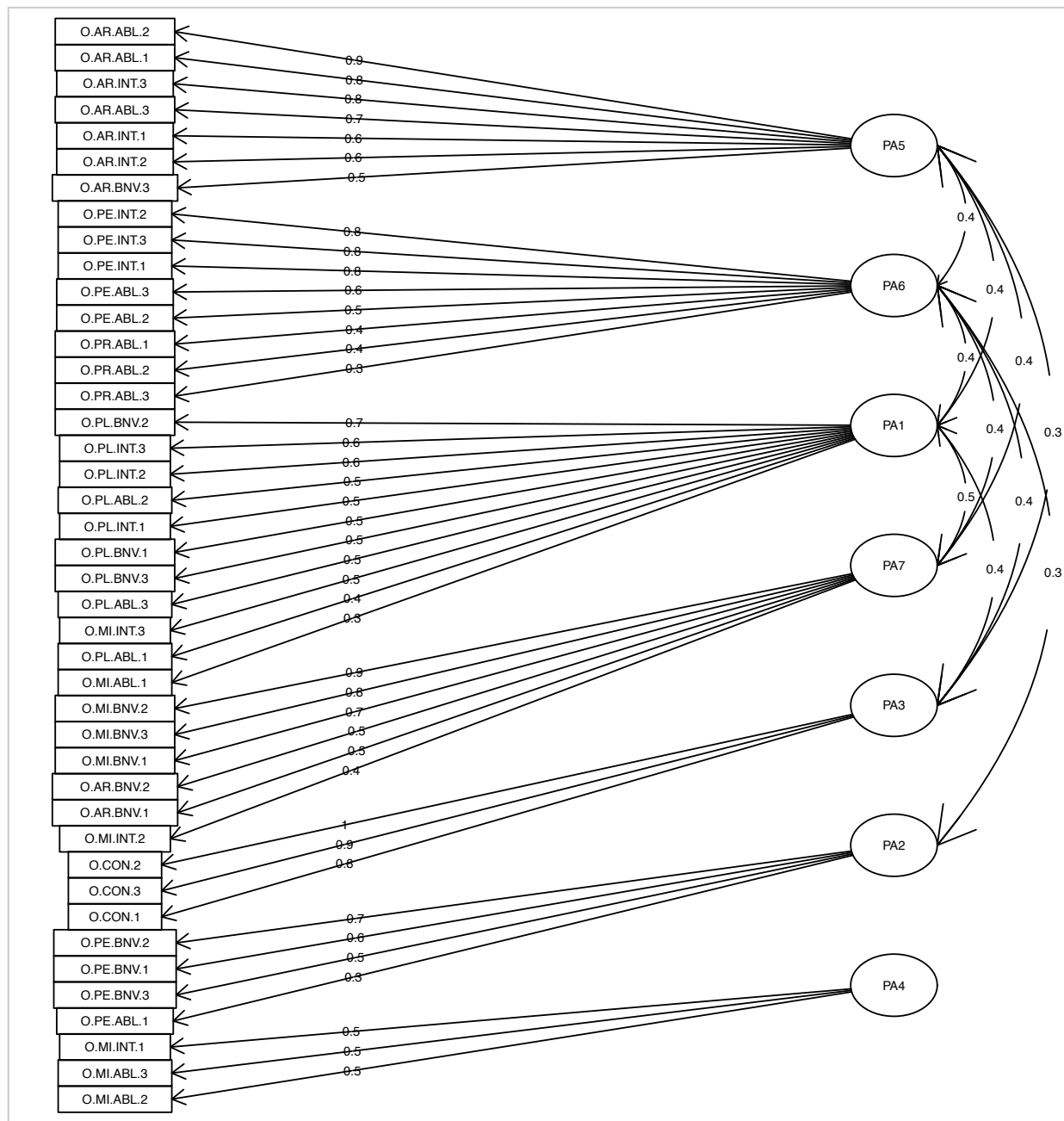


Exhibit G.2 – Visualisation of the structure of the factors from the parallel factor analysis on the provider's perspective.

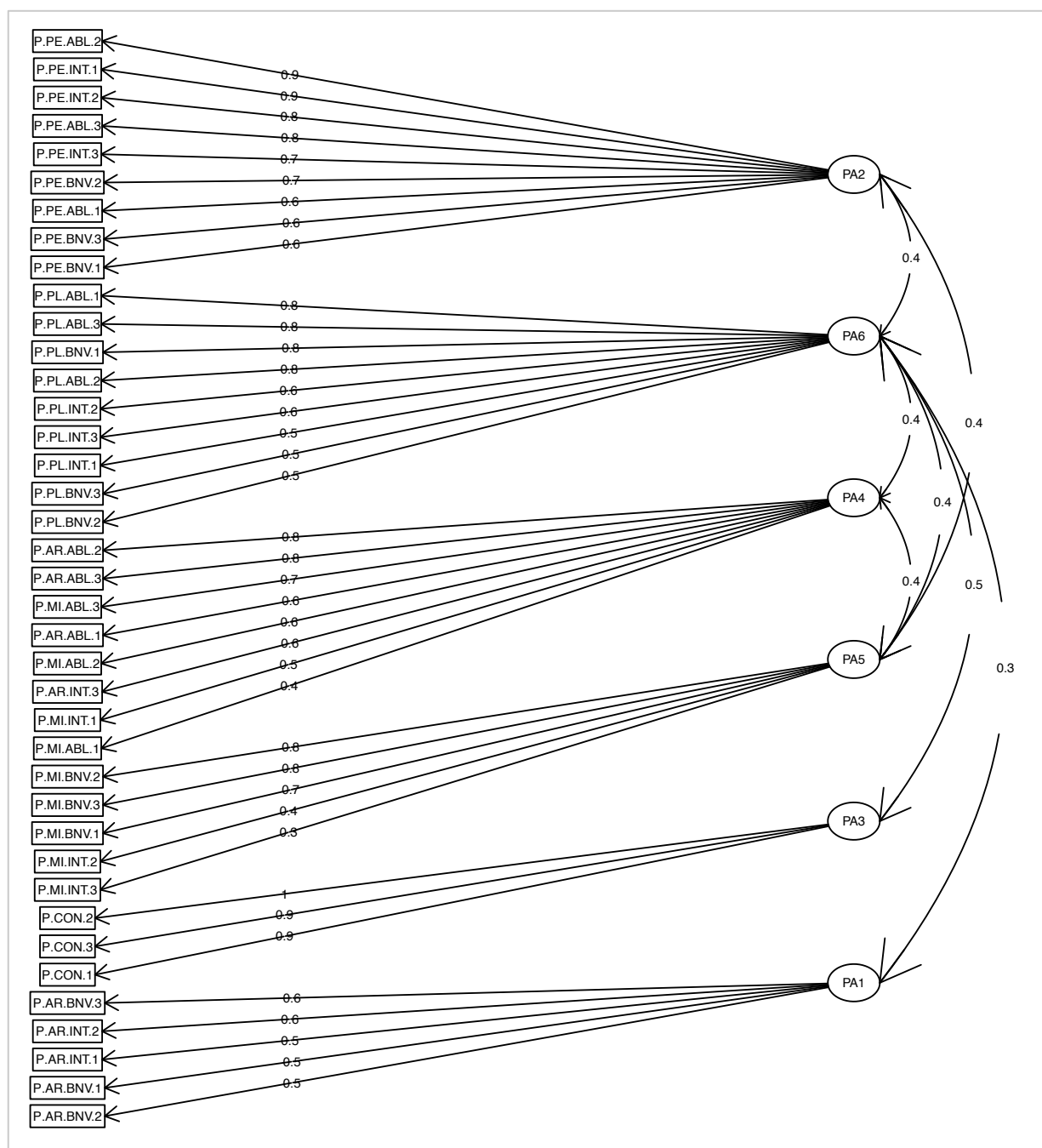


Exhibit H.1 – Summary of the factors, the items and their loadings resulting from the Exploratory Factor Analysis for the obtainer's perspective.

	Factor 5	Factor 6	Factor 1	Factor 7	Factor 3	Factor 2	Factor 4	Communality
	<i>O.FA.AR.ABL.INT</i>	<i>O.FA.PE.ABL.INT</i>	<i>O.FA.PL</i>	<i>O.FA.MI.BNV</i>	<i>O.FA.INT</i>	<i>O.FA.PE.BNV</i>	<i>O.FA.MI.ABL</i>	
Eigenvalue	16,86	3,07	2,06	1,85	1,53	1,13	0,95	
% Variance	40,96	8,05	5,61	5,09	4,40	3,49	3,04	
O.CON.1					0,788			0,712
O.CON.2					0,975			0,927
O.CON.3					0,869			0,762
<i>O.PE.ABL.1*</i>		0,196	0,28		0,123	0,329		0,434
O.PE.ABL.2	0,17	0,518		-0,143	0,106	0,313	0,24	0,687
O.PE.ABL.3		0,627	-0,123			0,181	0,23	0,606
O.PE.INT.1		0,766						0,712
O.PE.INT.2		0,848						0,739
O.PE.INT.3		0,787						0,686
O.PE.BNV.1		0,248				0,625		0,611
O.PE.BNV.2		0,168	0,125			0,681		0,717
O.PE.BNV.3		0,395		0,18		0,473	-0,214	0,684
O.PL.ABL.1		0,126	0,406		0,251	0,155	0,173	0,457
O.PL.ABL.2	-0,123	0,103	0,548		0,285		0,159	0,503
O.PL.ABL.3		0,2	0,488	-0,108	0,171	0,136	0,207	0,539
O.PL.INT.1	0,164	0,182	0,534					0,526
O.PL.INT.2	0,101		0,559		0,137			0,670
O.PL.INT.3	0,115	0,15	0,594		0,256		0,109	0,617
O.PL.BNV.1			0,494	0,134		0,37		0,577
O.PL.BNV.2		-0,113	0,653	0,16		0,335	-0,112	0,418
O.PL.BNV.3	-0,172	0,116	0,493	0,3	0,118			0,727
O.PR.ABL.1		0,444	0,146		0,29	-0,125		0,596
O.PR.ABL.2	0,141	0,412	0,159	0,143			0,236	0,711
O.PR.ABL.3*	0,105	0,31	0,203	0,184	0,244			0,549
<i>O.MI.ABL.1*</i>	0,186		0,322	0,277		0,167	0,281	0,560
O.MI.ABL.2	0,336		0,199	0,265			0,471	0,780
O.MI.ABL.3	0,291	0,165		0,272			0,539	0,732
O.MI.INT.1	0,173		0,209	0,34			0,539	0,759
O.MI.INT.2*	0,106	0,272	0,277	0,356		-0,263	0,17	0,629
O.MI.INT.3***	0,116	0,151	0,467			-0,159	0,281	0,495
O.MI.BNV.1				0,713			0,136	0,606
O.MI.BNV.2			-0,128	0,871		0,105		0,769
O.MI.BNV.3				0,841				0,755
O.AR.ABL.1	0,814	-0,136			0,105	0,11	0,117	0,772
O.AR.ABL.2	0,908				0,114		0,154	0,894
O.AR.ABL.3	0,704		-0,123				0,172	0,641
O.AR.INT.1	0,626						-0,224	0,538
O.AR.INT.2	0,603	0,256	0,256			-0,161	-0,395	0,773
O.AR.INT.3	0,765	0,104						0,793
<i>O.AR.BNV.1***</i>	0,323			0,451			-0,143	0,494
<i>O.AR.BNV.2***</i>	0,244		0,162	0,54			-0,153	0,658
<i>O.AR.BNV.3***</i>	0,476		0,113	0,314	0,134		-0,285	0,631

*Minor loadings **Cross-loading ***Lack of Content Fit

[illegible]

Exhibit I.1 – Results from the multiple linear regression model of the obtainer's perspective.

Dependent Variable : O.FA.INT / Intention to Obtain			
Variables	Coefficients	St.E.	Pr(> t)
<i>(Intercept)</i>	-0.100350	0.910806	0.912418
<i>O.FA.AR.ABL.INT*</i>	0.208595	0.087303	0.018139
<i>O.FA.PE.AB.INT</i>	0.144860	0.094746	0.128417
<i>O.FA.PL***</i>	0.329384	0.098051	0.000994
<i>O.FA.MI.BNV</i>	-0.143225	0.100448	0.156012
<i>O.FA.PE.BNV</i>	0.008913	0.086407	0.917983
<i>O.FA.MI.ABL</i>	0.079504	0.092241	0.390126
<i>Female*</i>	0.287076	0.150275	0.058024
<i>Age [18 - 25]</i>	-0.553685	0.856381	0.518931
<i>Age [25 - 35]</i>	-0.726944	0.856864	0.397598
<i>Age [35 - 50]</i>	-0.765278	0.861219	0.375660
<i>Age [50 - 65]</i>	-0.746155	0.851178	0.382117
<i>Age [65+]</i>	-0.591606	0.919694	0.521048
<i>Risk Propensity</i>	0.058288	0.035631	0.103987
<i>AirBnb Lessee Exp.*</i>	0.145520	0.084526	0.087232
<i>AirBnb Lessor Exp.</i>	0.102451	0.181701	0.573716
<i>Blockchain Aw. Small</i>	-0.227344	0.162501	0.163897
<i>Blockchain Aw. Medium</i>	0.037678	0.188299	0.841680
<i>Blockchain Aw. High</i>	-0.098058	0.247460	0.692487
<i>Blockchain Aw. Expert</i>	0.249416	0.867854	0.774213
****p<0.001 ***p<0.01 **p<0.05 *p<0.1			
RSE			<i>0.08287</i>
R-squared			<i>0.3313</i>
Adjusted R-squared			<i>0.2455</i>
F-statistic			<i>3.86</i>
p-value			<i>0.001367</i>

Exhibit I.2 – Results from the multiple linear regression model of the provider's perspective.

Dependent Variable : P.FA.INT / Intention to Provide			
Variables	Coefficients	St.E.	Pr(> t)
<i>(Intercept)</i>	-0,143538	0,940819	0,87895
<i>P.FA.AR.INT.BNL</i>	0,14662	0,133083	0,27236
<i>P.FA.PE</i>	0,079376	0,086257	0,35894
<i>P.FA.AR.ABL</i>	-0,049321	0,17382	0,777
<i>P.FA.MI.BNV</i>	-0,166391	0,129335	0,20026
<i>P.FA.PL ***</i>	0,507854	0,08929	0,000000066
<i>Female</i>	0,223264	0,154491	0,15051
<i>Age [18 - 25]</i>	-0,519162	0,877604	0,55504
<i>Age [25 - 35]</i>	-0,448179	0,874748	0,60916
<i>Age [35 - 50]</i>	-0,448046	0,889673	0,61528
<i>Age [50 - 65]</i>	-0,624376	0,878564	0,47839
<i>Age [65+]</i>	-0,247015	0,947806	0,79475
<i>Risk Propensity**</i>	0,106292	0,035245	0,00301
<i>AirBnb Lessee Exp.</i>	-0,127542	0,085037	0,13577
<i>AirBnb Lessor Exp.</i>	0,222422	0,183354	0,22702
<i>Blockchain Aw. Small</i>	-0,007371	0,165005	0,96443
<i>Blockchain Aw. Medium</i>	0,158661	0,192212	0,41044
<i>Blockchain Aw. High</i>	-0,202345	0,246641	0,4133
<i>Blockchain Aw. Expert</i>	1,405907	0,914193	0,1262
****p<0.001 ***p<0.01 **p<0.05 *p<0.1			
RSE			<i>0.8423</i>
R-squared			<i>0.3941</i>
Adjusted R-squared			<i>0.3209</i>
F-statistic			<i>5,385</i>
p-value			<i>0.00000001592</i>

