Utrecht University

MASTER THESIS

SUSTAINABLE BUSINESS AND INNOVATION

Variety and Success of Business Models in the Dutch Peer Economy

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Abstract

Peer economy businesses have emerged in recent years as a promising development to disrupt mainstream consumerism and contribute to the minimalization of resource use. Moreover, the peer economy is imposing new ways of doing business, thereby posing a threat to traditional businesses. Unsurprisingly, the phenomenon has gained increased attention from both researchers and practitioners. Despite this surge and interest, there is a lack of empirical research regarding the diversity and success of peer economy business models. This study addresses this void by mapping the Dutch peer economy and investigating whether complementarities between business model elements explain their performance. For this, the business models of 88 Dutch peer economy initiatives are operationalized and analyzed. Based on this data, a taxonomy comprising of five groups of business models that account for the total collection of empirically-relevant business models across the Dutch peer economy is revealed. In addition, this study produces no convincing evidence that the complementarities between business model elements predict higher levels of success. This study ends with a discussion of the results and its implications, and suggests a number of future research directions.

Keywords: peer economy; business models; taxonomy; hierarchical cluster analysis

Executive summary

It is known that the second industrial revolution from the mid-19th century led to great advancements in the quality of lives for many people. However, almost two centuries later, modern society is now increasingly being confronted with the drawbacks of this revolution. One such drawback is that of using more resources than we need and can be supported by the planet, or overconsumption. As a response, initiatives have started to surface that facilitate the exchange of goods and services amongst peers and formed a new sort of economy: the peer economy. Interestingly, the peer economy is increasingly receiving attention from both researchers and practitioners, due to its mitigation potential and its disruptive nature to traditional businesses.

Despite this surge and interest, there is a lack of empirical research regarding the diversity and success of peer economy business models. Instead, a one-size business model fits all is assumed. Given these knowledge gaps, this study aims at identifying (1) different groups of peer economy business models in the Netherlands and (2) providing an explanation for the varying levels of success of these business models.

To this end, this study operationalizes and analyzes the business models of 88 Dutch peer economy initiatives. First, a hierarchical cluster analysis is conducted to create a taxonomy of Dutch peer economy business models. Second, regression analyses are performed to test whether the varying levels of business model success can be explained by the complementarities that exist between business model elements.

The results of this study find that the variety in the Dutch peer economy can be explained according to five groups of business models. With regard to the success of peer economy business models, this study produced no convincing evidence that success can solely be explained by the complementarities that exist between business model dimensions (e.g. complexity theory).

Based on these findings, researchers are now enabled to understand the business models used by peer economy initiatives and can focus their research by choosing specific groups of the resulting clusters for further examination. Moreover, more research is needed on the mechanisms behind successful peer to peer platforms, as the findings of this study are inconclusive.

In addition, the findings of this study provide policy makers with a better understanding of the peer economy, which will help them with identifying the

implications of different business models. In turn, this allows for more fine-grained regulations to be created, instead of assuming that one-size regulation fits all. For example, business models that focus on the creation of social and environmental capital should typically be encouraged, whereas business models that only create financial capital should be discouraged.

Lastly, practitioners can use the findings of this research to identify business models that work and that do not work in the peer economy. In doing so, organizations can take ‘short-cuts’ in their search for higher performing business models and avoid underperforming business models altogether.

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List of abbreviations

AC	Agglomerative coefficient
B2B	Business to business
B2P	Business to peer
BMC	Business model canvas
BMI	Business model innovation
DIANA	Divisive analysis clustering
HAC	Hierarchical agglomerative clustering
HCA	Hierarchical cluster analysis
NPO	Non-profit organization
P2P	Peer to peer

1. Introduction

Contemporary society is faced with many environmentally related challenges. In particular, it has become clear that the world's ever-increasing rate of consumption of goods is already bringing forth adverse ecological consequences in the short-term and is unsustainable in the long-term (Schor, 2005; Tanner & Kast, 2003). In an ideal world, the solution to this problem is unambiguous; decrease consumption. Today's society, however, does not allow for such a clear-cut solution since the problem is "embedded in a socioecological system possessing the characteristics of "complex systems"; numerous interacting elements lacking any central control, nonlinear interactions between elements, constant change which is seldom reversible, and no clearly defined boundaries to the system" (Game, Meijaard, Sheil, & Mcdonald-Madden, 2014, p. 271), making it a complex or "wicked" problem (Camillus, 2008).

Yet, a promising concept that is expected to make a considerable contribution to the mitigation, or at least partial, of this overconsumption is recently receiving increased attention from both researchers and practitioners: the peer economy (Bellotti et al., 2015). In its most basic form, the peer economy comprises of all transactions (i.e. the exchange of goods and services) that take place among peers. Peers transacting amongst each other is not a new phenomenon by itself, as humans have been exchanging goods and services throughout history; before the introduction of money, commerce took place on the basis of bartering (Cheng, 2016). However, whereas in the past transactions amongst peers took place directly from one person to another and most often involved people that were familiar with each other, today these transactions are often intermediated and also occur beyond a person's social network (Frenken & Schor, 2017). Explaining this shift in behaviour, and the recent surge of interest in the peer economy, is the introduction of digital platforms. The role that these platforms assume is not the owning of goods or services, but rather to match strangers according to their demand and supply of goods and service, to create trust by providing a public review system and micro-transactions, and to handle the contract and payment (Frenken, 2017).

Since the organizations behind these platforms possess very few physical assets – only a digital application and limited customer support – their businesses are highly scalable; they have the ability to flexibly offer their services to a large number of users to a large number of users without incurring proportional costs (Täuscher & Kietzmann, 2017). Hence, the total market capitalization of these transaction platforms

is estimated to be well over one trillion US dollars and growing (Evans & Gawer, 2016). Combined with its growing userbase, these peer economy platforms, and the peer economy in general, are argued to be a disruptive development posing a threat to traditional businesses. Moreover, the peer economy yields the potential to disrupt mainstream consumerism and contribute to the minimization of resource use (Bellotti et al., 2015).

Even though peer economy firms all operate on the principle of matching supply and demand between peers and offering auxiliary services, they significantly differ in the type of transactions that they intermediate. Airbnb, for instance, operates on the basis of people temporarily offering their underutilized property to others for monetary compensation and often without any face-to-face contact upon arrival. On Couchsurfing, by contrast, people offer a spare room for free and often get into contact upon arrival. What this example illustrates, is that despite that Airbnb and Couchsurfing are both placed under the peer economy denominator, and offer very similar services, they nevertheless vary in terms of their business model.

A business model essentially explains the logic of how a firm creates and delivers value to their customers and how they make profit (Teece, 2010). The business model is recognized to portray a vital part of any organization as it offers an approach to effectively analyze, understand, communicate and manage strategic-oriented choices among stakeholders (Al-Debei & Avison, 2010). Further highlighting the importance of business models to a firm is the argument that “a mediocre technology pursued within a great business model may be more valuable than a great technology exploited via a mediocre business model” (Chesbrough, 2010, p. 355). The design of the business model is an essential decision for both entrepreneurs and general managers who are tasked with revising their old model; each business model having its own implications for the business’ performance potential (Zott, Amit, & Massa, 2011). Additionally, innovating and experimenting with new business models have become one of the key sources of firms’ competitive advantage recently. As a consequence, traditional business models, which were once dominant and stable in their respective industries, have given rise to a diverse set of disruptive business models (Lyubareva, Benghozi, & Fidele, 2014).

Despite the fact that this development is also observed within the peer economy, little is known about which elements structure and shape the diversity of these business models. Rather, it appears that “most media and emergent scholarship

seem to paint all sharing activities and businesses in particular with the same brush, assuming that a one-size business model fits all" (Muñoz & Cohen, 2017, p. 21). Existing academic literature has addressed this issue in a number of studies, which resulted in classifications of sharing business models (e.g. Muñoz & Cohen, 2017; Ritter & Schanz, 2019). However, these studies examine only a subset of the peer economy (i.e. the sharing economy), and therefore do not account for the business model variety in the entire peer economy.

In addition, despite the disruptive nature of and the potential ascribed to the peer economy, there is no guarantee for success for new platform companies. That is, some peer economy initiatives seem to be very successful (e.g. Airbnb), whereas others are met with less success or even cease to exist (e.g. Tuintjedelen). As mentioned before, the business model design is considered to play a central role in explaining business performance (Zott et al., 2011). Yet, little is known about what causes peer economy business models to differ in performance (Benoit, Baker, Bolton, Gruber, & Kandampully, 2017). This issue is also pointed out by Guyader and Piscicelli (2019) who argue that the mechanisms behind successful peer to peer platforms is a still under-explored area of research.

Considering the recent increase of interest in both the peer economy and business models, and their disruptiveness to traditional markets, the dearth of empirical research that exists on the intersection of these two fields is remarkable. In addition, the misconception that all business models in the peer economy are the same while in fact they are quite diverse, both in their structure and their success, warrants a closer examination. Therefore, this research seeks to address these gaps by exploring the following research question:

"How can the variety and success of peer economy business models in the Netherlands be explained?"

By applying extant conceptualizations on business models (e.g. Osterwalder, 2004) and complexity theory (e.g. Kauffman, 1993), this research is thus focused on understanding the diversity and success of business models within the space.

Apart from addressing this gap in the literature and contributing to the sustainable business model literature, this study also makes some societal contributions. By investigating the variety and success of peer economy business

models, this study offers insights into the structure and success of the peer economy. Policy makers stand to benefit from such an enhanced understanding as they are currently struggling to keep up with the rapid introduction and growth of the peer economy (Muñoz & Cohen, 2017). More specifically, it allows for more fine-grained policy-making since the implication of business models can be better distinguished from each other.

The remainder of this research is organized as follows. Firstly, a brief overview of the theoretical concepts used in this research is given. This section also introduces the hypotheses of this study. Secondly, the methodology and sampling approach of this study are described. Thirdly, the clusters that emerged are introduced and described and the hypotheses are tested. The research concludes with the discussion of the results, limitations of this study and possible avenues for future research.

2. Theory

2.1. Peer economy

Despite the rapidly growing interest in the peer economy amongst both researchers and practitioners, there is an ongoing semantic confusion about what exactly constitutes the peer economy. In its broadest sense, the peer economy can be defined as an economic principle that encompasses every transaction taking place between two individuals. However, such a loose definition supports a wide range of transactions that might differ on several aspects from each other and paves the way for the development of a set of concepts that each describe a different group of transactions. As a result, the peer economy is often used interchangeably with other related terms, such as collaborative economy, gig economy, and sharing economy (Bellotti et al., 2015). Their commonality, as aforementioned, stems from the fact that transactions in these economies take place from peer to peer (P2P) as opposed to business to peers (B2P) or business to business (B2B). Yet, regardless of this common denominator, these terms are not the same.

This thesis follows Frenken and Schor's (2017) seminal work on the sharing economy in order to conceptualize the peer economy as evident in this research. In their research they clearly distinguished between the sharing economy and three other types of platforms, as depicted in Figure 1. More importantly, according to them the peer economy can be seen as an aggregated construct that consists of three dimensions; the on-demand economy, or gig economy, the second-hand economy, and the sharing economy.

The activity of sharing traces back to pre-modern societies, in which sharing was already common to take place among family members and friends (Cheng, 2016). This type of sharing, sometimes referred to as offline sharing, relied on the emotional bonds and past interactions that existed among individuals, and excluded the sharing of goods with strangers due to a lack of information about their trustworthiness (Frenken, 2017). However, due to the advent of the Internet, the costs associated with carrying out an economic transaction (e.g. transaction costs), decreased significantly and people became more willing to share their goods with strangers (Lee & Clark, 1996).

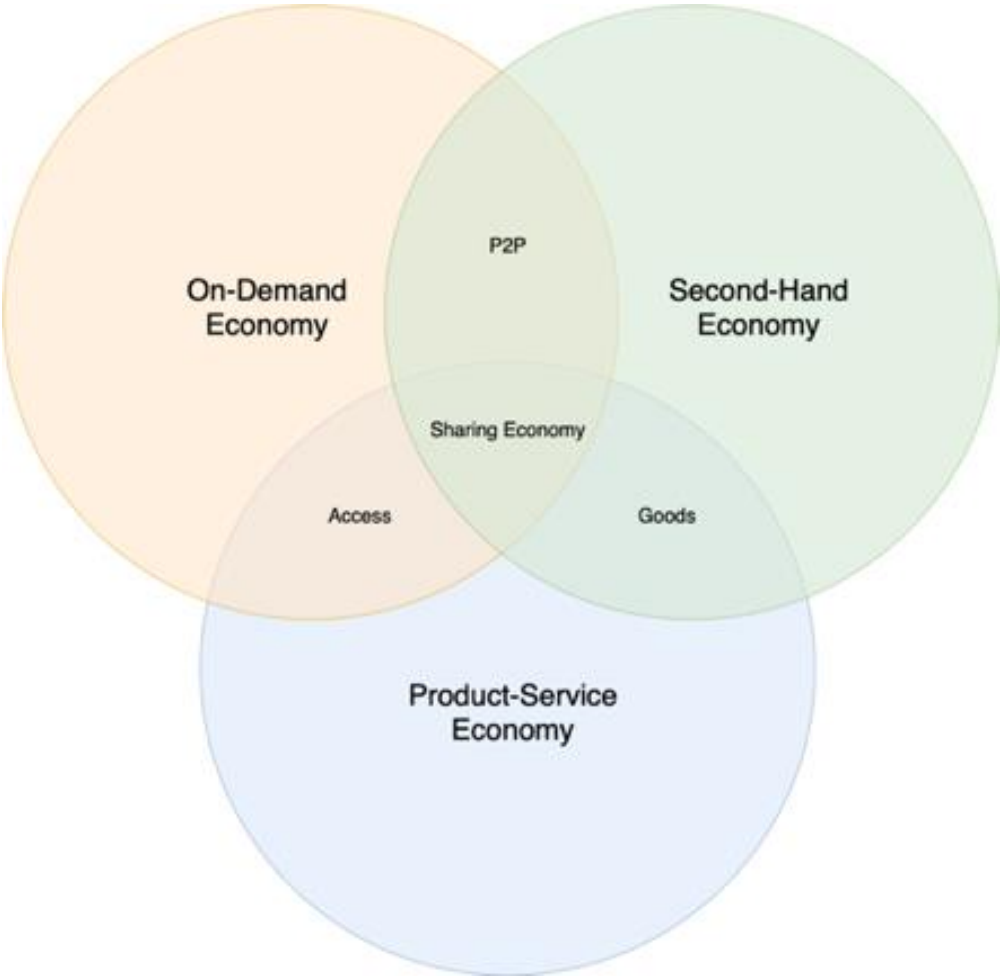

Figure 1. Sharing economy and related forms of platform economy, adopted from Frenken and Schor (2017).

According to (Frenken & Schor, 2017), transactions performed in the sharing economy have to adhere to three defining characteristics: the transaction should take place between consumers or peers, the transaction involves the transfer of a physical good, and access to the good should only be temporarily.

Other than the sharing economy, consumers active in the second-hand economy grant each other permanent access, rather than temporary access to their goods, and these transactions can be both with and without monetary compensation (Frenken & Schor, 2017). Well established examples of platforms intermediating these kinds of interactions, include Ebay operating internationally and Marktplaats serving the Dutch market.

Finally, the on-demand economy involves consumers granting each other temporary access to services, as opposed to physical goods (Frenken & Schor, 2017). Put differently, the on-demand economy matches demand and supply of temporary

work and services between peers. The on-demand economy can be further divided into two types of work: “crowd work” and “work-on-demand”, or *off-site* (e.g. Amazon Mechanical Turk*)* and *on-site* (e.g. Uber*)* work (De Stefano, 2016). The former allows its participants to operate from anywhere in the world as it involves “microtasks” that only require an internet connection, whereas the latter requires participants to be geographically proximate to each other since the activities are performed locally. Due to the scope of this thesis, only the latter category will be considered.

Additionally, other related concepts such as crowd-funding (e.g. Mollick, 2014), content sharing (e.g. Frenken & Schor, 2017) and open-source projects (e.g. Hamari, Sjöklint, & Ukkonen, 2016) do not fall within the boundaries of this research, since they are not considered as actual transactions taking place between peers, but rather are examples of peer-to-many and many-to-peer transactions. Figure 2 depicts the conceptualization of the peer economy evident in this research.

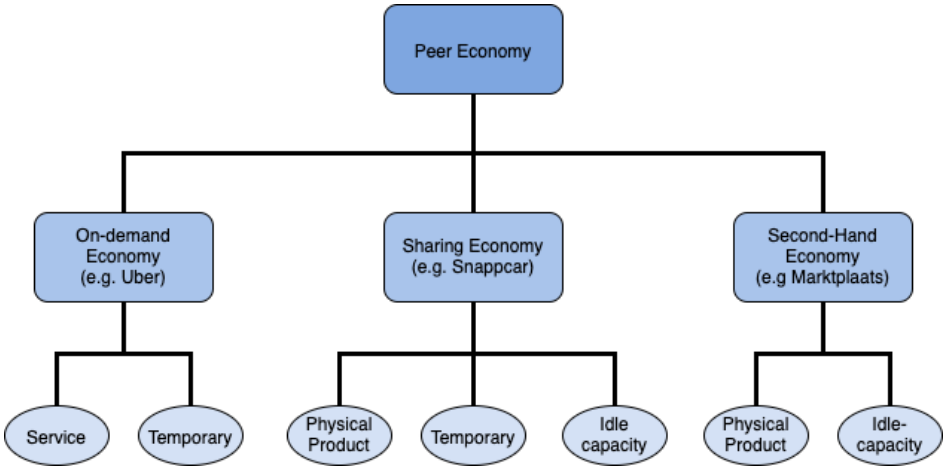

Figure 2. Conceptualization of the peer economy

2.2. Business models

It is a common misconception that business models only recently became crucial to firms, while in fact business models have been integral to the trading and economic behavior of pre-classical societies (Teece, 2010). Yet, it is observed that interest in the business model concept has considerably increased since the mid-1990s (Zott et al., 2011). This sudden surge of the business model concept is most often ascribed to the emergence of new communications and computing technology (i.e. the Internet), as they lowered transaction costs and increased customer power (Teece, 2010; Zott et al., 2011). As a consequence of this shifting equilibrium between customer and

supplier, many old ways of doing business became obsolete and traditional companies were forced to rethink, if not redesign, their business models (Teece, 2010).

Despite the overall increase of interest in the business model concept, there is an ongoing discourse among scholars on what a business model is (Zott et al., 2011). While acknowledging the ambiguousness that currently resides around the exact definition of business models, this research follows Teece's (2010) definition on business models:

> "A business model describes the design or architecture of the value creation, delivery and capture mechanisms employed. The essence of a business model is that it crystallizes customer needs and ability to pay, defines the manner by which the business enterprise responds to and delivers value to customers, entices customers to pay for value, and converts those payments to profit through the proper design and operation of the various elements of the value chain." (p. 179)

A proper business model remains essential to any organization, both entrepreneur and incumbent, as it provides them with an effective approach to analyze, understand, communicate and manage strategic-oriented choices among stakeholders (Al-Debei & Avison, 2010). Additionally, an organization that seeks to profit from newly developed technologies, will only succeed when this technology is commercialized through an appropriate business model; the technology on itself has no single objective value (Chesbrough, 2010). Moreover, firms that operate in a dynamic environment may have to respond to new developments that emerge. The most obvious response would be by means of product innovation – change some aspect of the product it is currently selling or develop an entire new product – supported by a proper business model. Yet, besides the supporting role of the business model as a vehicle for product innovation, the business model can also be considered as a source of innovation itself; also referred to as business model innovation (BMI).

The aforementioned three main archetypes of a business model – value creation, value delivery and value capture – can be further divided into a set of dimensions. The number of dimensions, or elements, used in literature varies strongly; ranging from as little as four to as many as twenty (Clauss, 2017). This research adopts the business models canvas (BMC) developed by Osterwalder and Pigneur (2010), as this particular framework is well established in the scientific community and is widely used by practitioners. Moreover, the nine dimensions of which the BMC

consists were derived upon through an extensive literature review of a great number of former conceptualizations of business models (Fritscher & Pigneur, 2010; Osterwalder, 2004). Put differently, the BMC is an inclusive framework, since it essentially synthesizes the perspectives of former work on business models into one framework. An overview of the dimensions and a further description can be seen in Table 1. In turn, each dimension of the BMC contains one or more sub-dimensions, varying per organization.

The different dimensions of the BMC do not exist in isolation of each other, but are rather interconnected and interdependent (Zott & Amit, 2010). Consequently, the success of a business model, and therefore the success of a business, thus depends on the alignment of the different dimensions. Hence, change in one of these dimensions might be beneficial for some of the functions of the business model, but at the same time can be disadvantageous on other functions, potentially implying a loss in overall functioning of the business model as a whole (Frenken, 2006). This is in line with the theory on complex systems which will be further elaborated upon in the next section.

Table 1.

Categorization and description of the nine business model dimensions, adopted from Osterwalder and Pigneur (2010).

BM Dimension	**BMC Dimension**	**Description**
Value creation	Customer segments	Defines the groups of people a firm wants to reach and serve.
	Value proposition	Describes the bundle of products and services that create value for a specific customer segment.
Value delivery	Channels	Describes how a firm communicates with and reaches its customer segments.
	Customer relationships	Describes the types of relationships a firm establishes with specific customer segments.

Table 1 (continued).

	Key resources	Describes the most important assets required to deliver the value proposition.
	Key activities	Describes the most important activities a firm performs to deliver the value proposition.
	Key partnerships	Describes the network of suppliers and partners that the firm requires to deliver the value proposition.
Value capture	Revenue streams	Describes the way a firm generates money from each customer segment.
	Cost structure	Describes all costs incurred to operate a business model.

2.3. Business models as complex systems

In general, a complex system can be defined as "a system comprising a large number of parts characterized by non-linear interdependencies" (Massa, Viscusi, & Tucci, 2018, p. 60). As aforementioned, the different dimensions that conceptualize the business model do not operate on their own, rather interdependencies exist between these dimensions creating a whole that is more than the mere sum of its parts (Massa et al., 2018). In other words, the business model consists of interdependent elements that must be internally aligned and coherent. When the business model is internally consistent, this may translate into a sustained competitive advantage for the firm (Morris, Schindehutte, & Allen, 2005). Yet, it is these epistatic relationships that are at the source of the complexity in designing a business model, as "only some combinations between elements fit well together in the sense that they are complementary" (Frenken, 2006, p. 9).

An example illustrating the interdependencies of a business model can be found in the air travel industry. A few decades ago this industry was disrupted by low cost carriers that started to offer flights for reduced ticket prices. To accommodate the lower fares, these carriers adopt a business model that differs in many aspects from those of legacy carriers. Low-cost carriers differentiate themselves by operating short-

and medium-haul flights, maintaining a homogeneous fleet, having a low service orientation (e.g. charge for on-board catering, reserved seating, and luggage) and having low operating costs (e.g. online ticket sale and check-in, use of secondary airports) (Urban, Klemm, Ploetner, & Hornung, 2018). However, the success of low-cost carriers cannot be ascribed to one individual aspect but results from the combination of these aspects; the business model elements and their interdependencies. Consequently, the change of only one aspect may produce a business model that is no longer internally consistent and thus less successful. For example, when a low-cost carrier decides to include long-haul flights to its offerings, this is likely to affect other aspects of its business model. Longer distances generally means a larger plane is needed, which might not be able to land on secondary airports. In addition, whereas people might accept discomfort and low service for a small amount of time, this is unlikely to be the case with longer flights.

The design of business models can be understood as a complex optimization problem since the set of optimal choices for the elements is typically suboptimal due to the interdependencies that submerge when these elements are placed into one system (Frenken, 2006). Underlying this optimization problem is the fact that the number of combinations is an exponential function of the number of elements, or combinatorial complexity (Frenken, 2006). In design theory, all possible combinations of elements are called the design space of a technology, and each combination of elements can be labeled by a specific string (Frenken, 2006). For instance, a building design with wooden foundation, wooden walls, and flat roof can be coded as ‘000’, whereas a building design with a concrete foundation, wooden walls, and flat roof can be coded by the string ‘100’. For a system with a low level of combinatorial complexity, one might be able to measure the effect that changing one element has on the overall performance since the total amount of interdependencies is limited. However, as the combinatorial complexity of the system increases, it becomes increasingly difficult to capture all interdependencies between a systems’ elements and to measure the change in performance when one element is altered. Instead, such complex systems can be discussed by developing a conceptual model that is an abstraction of reality. This study adopts the NK-model to represent the complexity stemming from the interdependencies among the dimensions of a business model (Valente, 2014).

Complex systems can formally be modelled by Kaufmann’s (1993) NK-model of complex systems. Within this model, N refers to the number of components in the

system, whereas K reflects the ‘degree’ of interaction between the systems’ components. For example, a K-value of one means that each component affects one other component apart from itself. Systems of maximum complexity are those systems in which every component is interdependent with one another and thus have the highest K-value (Csaszar, 2018).

The NK-model simulates the effects of epistasis by constructing a fitness landscape in which each string in the design space is assigned a fitness value; a measure indicating the systems performance (Frenken, 2006). Put differently, “the fitness landscape metaphor refers to the distribution of fitness values of different designs in design space” (Frenken, 2006, p. 12). Strings within this distribution that yield a higher fitness value than its neighboring strings are referred to as local optima, whereas the string with the highest fitness value is called the global optimum (Kauffman, 1993). The number of peaks – global and local optima – within a landscape depends on the K-value of the system; a higher K-value, and thus higher complexity, results in more local peaks (Csaszar, 2018). A hypercube representation of a fitness landscape consisting of three elements and maximum complexity, is presented in Figure 3.

Underlying this model there are three assumptions. First, a designer is not able to observe the entire landscape. That is, the designer is not able to see where the peaks in the landscape are and therefore cannot deduce which direction will be most profitable beforehand (Frenken, 2006). Instead, a designer needs to search the landscape string by string and test whether fitness increases with the new string. This search process is called “hill climbing” and eventually results in the achievement of a peak, either global or local (Csaszar, 2018). Second, it assumes a search distance of one, meaning that only one element is mutated at a time. While search strategies with larger search distances are possible, a search distance of one is the most cost-efficient strategy (Frenken, 2006). Last, this search process for a higher performing design is path dependent since past decisions are determinative for the future search paths (Frenken, 2006). As a result, once an optimum is reached, designers are bound to it; evolving into another optimum is not possible, unless a greater search distance is used. Additionally, since the number of local optima exponentially increases with the complexity of the system, designers are more likely to end up in a local optimum than to find the global optimum in a system with higher complexity (Frenken, 2006).

Besides the aforementioned internal selection process, Frenken (2006) argues that designs are also subjected to market competition at the level of competing firms. Moreover, he argues that since different designers will arrive at different optima due to the path dependency of their choices, this will result in a variety of locally optimal designs that will compete for users in the marketplace. Thus, the total variety of designs depends both on the number of interdependencies K (the higher K the more optima) and on the strength of competition (the more competition, the fewer optima will be inhabited) (Frenken, 2006).

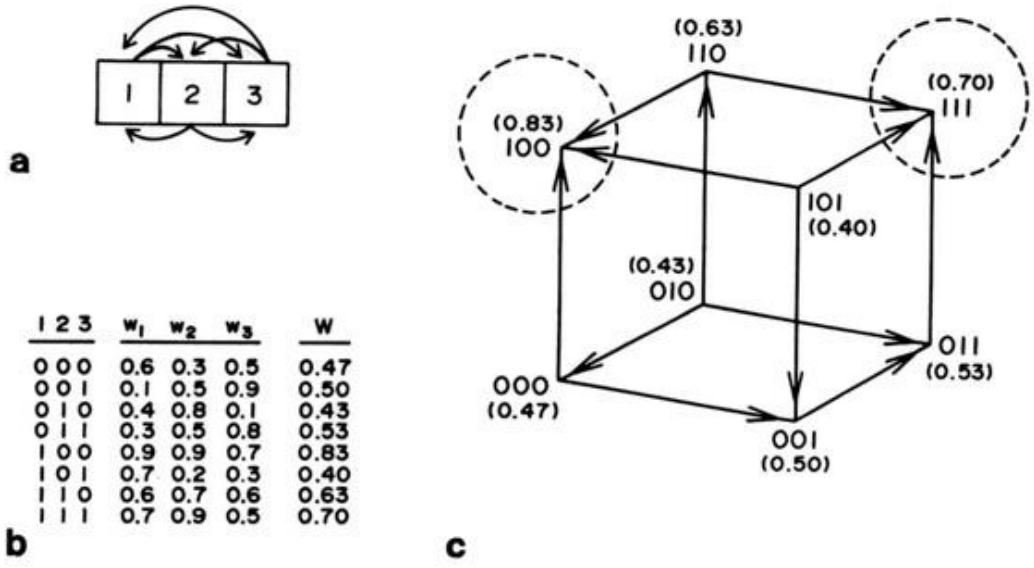

Figure 3. (*a*) elements and the connections of a complex system (K=2), (*b*) fitness table, (*c*) fitness landscape with 100 (0.83) as global optimum and 111 (0.70) as local optimum; adopted from Kauffman (1993, p. 42)

2.4. Hypotheses

According to complexity theory a variety of configurations of business models is possible because of the interdependencies that exist between the dimensions of the business model. Yet, not all business model configurations are similar in terms of their fitness as some combinations between dimensions fit better together than others. That is, some business model configurations are more successful than others since their dimensions are better internally aligned, also referred to as global and local optima. Moreover, the hill-climbing assumption of the NK-model assumes organizations keep revising their business model until they have reached such optima. Therefore, most organizations will likely have adopted a business model that represents a local

optimum. In other words, the Dutch peer economy is expected to be characterized by a few high performing dominant business model designs which are adopted by many peer economy initiatives.

H1*: The Dutch peer economy is characterized by a few high performing business models*

Since local optima represent the business models with the highest levels of performance and most initiatives are assumed to have adopted these business models, a positive relationship is expected between the closeness of business models and business performance. Put differently, if your business model design matches that of a local optimum, you are operating a successful business model configuration and your business model is likely to be very similar to that of other businesses (i.e. hill climbing assumption). Conversely, if your business model design does not match that of a local optimum, odds are that you are operating a business model with little complementarities and have low business performance. Few firms will employ such business models, since they are less competitive and may lead to bankruptcy. Therefore, it is expected that proximate business model designs predict higher levels of business performance.

H2: *Business model proximity predicts higher levels of business performance*

3. Methodology

This section presents the methodological approach used to answer the aforementioned research question – the research design, case selection, the data collection process and the data analysis techniques used.

3.1. Research design

This research aimed at identifying (1) different groups of peer economy business models in the Netherlands and (2) providing an explanation for the varying levels of success of these business models. Accordingly, this research consisted of two phases; first grouping the Dutch peer economy business models, and second exploring whether complexity theory explains their relationship with success. Given these objectives, a quantitative research approach seemed most appropriate. More specifically, a cluster analysis and multiple regression analyses were conducted to create results.

3.2. Case selection

Two conditions are critical for a grouping to produce a meaningful outcome. First, the cases studied should be exposed to comparable controlling conditions to ensure comparability between them. Second, enough cases should be compared to one another. Therefore, this research focused on the peer economy in the Netherlands; it is rich in peer economy firms and the same set of controlling conditions can be assumed to apply to them all.

An initial list of firms was created by using an online database containing information of more than 200 peer economy initiatives in the Netherlands[1] (Arets, 2016). The list was then supplemented with additional initiatives that were identified through online news articles[2] and the author's personal experience. This resulted in an initial list of 234 peer economy initiatives, spanning eleven sectors. These initiatives were then assessed against a set of criteria and excluded from the list if needed. Both the finance and ecosystem sector, and its initiatives, were excluded since they did not meet the earlier mentioned conceptualization of the peer economy (section 2.1). The

[1] www.deeleconomieinnederland.nl

[2] Search query used: "Deeleconomie Nederland", "Peereconomie Nederland", "Platformeconomie Nederland", "P2P Nederland", "Kluseconomie Nederland", "Tweedehands economie Nederland", "Sharing economy the Netherlands", "Peer economy the Netherlands", "Platform economy the Netherlands", "P2P the Netherlands", "Gig-economy the Netherlands", "Second-hand economy the Netherlands"

former facilitated many-to-one transactions as opposed to one-to-one transactions, whereas the latter facilitated B2B or B2P transactions as opposed to P2P transactions. Likewise, several other individual initiatives that did not meet the peer economy criterium or that did not operate in the Netherlands anymore, were also excluded from further analysis. Apart from exclusion, some other noteworthy changes were made to some of the remaining initiatives; 1) initiatives corresponding with the healthcare sector were merged with the service sector, since healthcare is a form of service; 2) The current Uber service was not included as this concerns professional drivers only; instead, we included the former service UberPop, which has been suspended in the Netherlands by now; 3) initiatives that had been taken over and merged into one, are considered as one initiative; and 4) initiatives that had changed their names were altered accordingly. The resulting dataset consisted of a total of 92 individual firms and 102 initiatives. Accordingly, this indicates that some organizations run multiple initiatives (e.g. Meetjune, Peerby, Knoowy, Jipio). Put differently, these organizations operate two (e.g. dual) or more (e.g. multiple) business models at once (Casadesus-Masanell & Tarzijan, 2012; Markides & Charitou, 2004). Moreover, note that during the data collection, some additional changes were made to the dataset as explained below.

3.3. Data collection

The data for this study was gathered in a time period of three months, February 2020 till May 2020, and was mainly collected by means of document analysis – a procedure for systematically reviewing or evaluating both printed and electronic documents (Bowen, 2009). Main sources of data were the organizations' social media and website (e.g. their FAQ, terms and conditions, and privacy statement), press and news articles, a social network for professionals (e.g. LinkedIn), marketing analytics software (e.g. SEMrush), and online data aggregators (e.g. Crunchbase and the Dutch chamber of commerce). In the case an organization ceased to exist, an attempt was made to access their website using a digital archive[3].

3.3.1. BMC operationalization

The canvas, as presented in section 2.2.1, qualitatively describes an organization's business model. Yet, the methods of analysis used in this study require quantitative

[3] http://www.archive.org

data. To operationalize the dimensions of the BMC for this study, both deductive and inductive categorization were used. Deductive categorization uses existing categories from the literature (e.g. Kuehl, Walk, Stryja, & Satzger, 2015; Osterwalder & Pigneur, 2010), and was used to create an initial operationalization of the BMC. Next, a preliminary set of business model data was formed by applying the aforementioned operationalization on the first twenty organizations of the sample, and was subsequently analyzed to see if additional categories emerged from it (Hsieh & Shannon, 2005). The resulting operationalization, as shown in Table 2, was then used as a framework to collect information about the business models of the sample. A brief description of each dimension and its associated categories will follow below.

BMC categories

Customer segment reflected the kind of customer that was addressed by the organization and was represented by one category, or variable. The values that this variable could assume corresponded with the different economies that make up the peer economy; on-demand, sharing, and second-hand.

Customer relationships was composed of three variables; active customer support, terms and conditions, and newsletters. Active customer service reflected whether an organization offered its customers active support (i.e. phone or live chat) as opposed to passive support (i.e. contact form or mail). The other two variables indicated whether an organization disclosed their terms of conditions on their site's homepage and whether they sent newsletters to their customers, respectively.

Channels consisted of two variables; app and blog. The former referred to an organization's sales channel and registered if a native app was offered to its customers. The latter referred to an organization's marketing channel and indicated whether an organization used a blog to reach its customers.

Value proposition was measured by the value that was offered to customers, and could assume three values; profit, planet, and people. An organization was labelled as 'profit' if the primary reason for participating was economical. Similarly, an organization was labelled as 'planet' if participation was based on ecological considerations and labelled as 'people' if social incentives were the reason for participating.

Key activities consisted of four variables; matching, screening, insurance, and review system. Matching relates to how the users of the organization's platform were

paired with each other, and this could either be passive (i.e. users had to search and contact for a match themselves), active (i.e. the organization would actively match its users based on their preferences), or real time (i.e. a smart algorithm that instantaneously matches users). The other three variables measured whether or not users had to verify their identity, the organization offered its users insurance, and if the organization had a review system in place respectively.

Key resources were formed by three variables; algorithm, data collection, and founders experience. Algorithm measured whether an organization integrated a sophisticated algorithm in its platform (i.e. matching users and ranking results based on user characteristics). Simple algorithms, such as an algorithm that filtered results based on users' preferences, were not included. Data collection reflected if an organization gathered information about its users and shared this information with third parties. The founders' experience indicated whether the founders of an organization had any prior experience with starting an enterprise.

Key partners were composed of three variables; insurer, investor, strategic partnerships. The first two variables checked whether the organization was backed by an insurer and one or more investors respectively. Strategic partnerships measured whether an organization was engaged in a strategic partnership with other organizations, which had to make a significant contribution to the organization to be labelled as such (e.g. joint venture). Merely providing a link to another organizations' website did not suffice.

Revenue streams consisted of seven variables, each representing a unique way of generating revenue; transaction fee, subscription, set price, donations, advertising, licensing, and freemium. A transaction fee could either be a percentage of the value or a flat rate (i.e. two euros per trade). Subscriptions are recurring payments that could either be based on monthly or annually. With a set price revenue model, a user makes a one-time payment to use the platform. Donations implied both individual donations or institutional donations in the form of a subsidy. Usage of a platform was without any direct costs under an advertising model, as revenue was generated by presenting advertisements to its users. With a licensing model income an organization generated income by allowing its platform to be used by another (governmental) organization against a usage fee. A freemium model implied that the most basic services of a platform were free for all, while more sophisticated services

required payment. Note that more than one revenue stream could be ascribed to a single business model.

Cost Structure was measured by one variable, which indicated whether an organization has high fixed costs (i.e. many employees or offices).

Table 2.

Operationalization of the BMC.

BMC Dimension	Variable	Values	Coding
Customer segment	Customer segment	On-demand | Sharing | Second-hand	0|1|2
Customer relationships	Active customer support	No | Yes	0|1
	Terms and conditions	No | Yes	0|1
	Newsletters	No | Yes	0|1
Channels	App	No | Yes	0|1
	Blog	No | Yes	0|1
Value proposition	Value offering	Profit | Planet | People	0|1|2
Key activities	Matching	Passive | Active | Real time	0|1|2
	Screening	No | Yes	0|1
	Insurance	No | Yes	0|1
	Review system	No | Yes	0|1
Key resources	Algorithm	No | Yes	0|1
	Data collection	No | Yes	0|1
	Founders experience	No | Yes	0|1
Key partners	Insurer	No | Yes	0|1
	Investor	No | Yes	0|1
	Strategic partnership	No | Yes	0|1
Revenue stream	Transaction fee	No | Yes	0|1
	Subscription	No | Yes	0|1
	Set price	No | Yes	0|1
	Donations	No | Yes	0|1
	Advertising	No | Yes	0|1
	Licensing	No | Yes	0|1
	Freemium	No | Yes	0|1
Cost structure	Fixed costs	Low | High	0|1

3.3.2. Business performance

Business performance was measured by three success variables: *longevity*, *traffic*, and *business size*. An overview of these variables is provided in Table 3. The longevity of an organization was the duration that organization had existed from its founding

date and was measured in months. Moreover, since web traffic is said to be a proper estimator for business performance, the amount of organic traffic (e.g. visits generated through natural behavior as opposed to paid ads) each organization monthly received was also captured (Vaughan & Yang, 2013). The last variable, business size, measured the size of an organization in terms of the number of employees that were working for an organization.

Table 3.

Description of variables measuring BM performance and their scale of measurement

Variable	Description	Measurement scale
Longevity	Months of existence	Ratio
Traffic	Number of natural monthly visits	Ratio
Business size	Number of employees	Ordinal

3.3.3. Procedure

The first step of the data collection was the operationalization of the nine BMC dimensions into measurable factors, as specified before. Next, an Excel sheet was created, and each initiative was given its own entry. The columns of the sheet represented the BMC dimensions and its corresponding variables, and the business model performance variables. Using the aforementioned sources, data was then systematically gathered for each variable on a firm-by-firm basis (see Appendix A).

To fill in the BMC, first the initiatives' social media and website were scraped and later supplemented with data retrieved from news and press articles, LinkedIn and online data aggregators. If certain information could not be retrieved, by using the abovementioned sources, organizations were directly approached. On the occasion that information about one or more variables could still not be retrieved, certain decisions were made with regard to inclusion. Moreover, if during the data collection process an organization was found to operate multiple business models concurrently, an additional entry was made for each business model. For an overview of the organizations and initiatives in the final dataset and the exclusion of others, see Appendix B.

Information about the presence of an organization was mainly retrieved from the organizations' social media and website. If no judgement on the activity could be made by visiting the website, additional sources were consulted and in some cases a

user account was created. Data on an organizations' longevity was collected using a combination of their website and social media, news and press articles, and LinkedIn. The number of natural monthly visits an organization received was collected using SEMrush – an online marketing analytics tool. Traffic was registered for both desktop and mobile visitors. To create consistency in the obtained results, traffic was collected for the month March and was limited to visitors with a Dutch IP-address. Lastly, the business size was retrieved from LinkedIn, and placed an organization in a range of employees (i.e. 0-1, 2-10, and 11-50). If data on certain variables was not available, this was recorded accordingly.

3.4. Data analysis

To answer the research question, the gathered data was analyzed using two quantitative research methods. First, to develop a taxonomy of peer economy business models and investigate the first hypothesis, a hierarchical cluster analysis (HCA) was used. Regression analyses were used to test the second hypothesis.

3.4.1. Hierarchical cluster analysis

Cluster analysis is an unsupervised learning technique, as the output variable is not prespecified. It uses a set of mathematical techniques to identify groupings of objects within a data set, based on their (dis)similarity (Romesburg, 2004). Various models have been developed that each represent a different form of cluster analysis, such as k-means clustering and hierarchical clustering. This research used hierarchical clustering, also known as connectivity-based clustering, to discover inherent groupings in the data. An important characteristic of hierarchical cluster analysis (HCA) is that it identifies groups in the data without the requirement of specifying the number of clusters beforehand. Since the goal of this research was to identify classifications of peer economy business models from the data, HCA was well suited for this purpose.

Within HCA a further distinction can be made between hierarchical agglomerative clustering (HAC) and divisive analysis clustering (DIANA). With HAC each object in the data set is initially being treated as its own cluster, or leaf. At every consecutive step of the algorithm, the most similar clusters are combined into a new larger cluster, or nodes, according to a chosen similarity measure. This process is iterated until all objects have been combined into a single cluster, also known as the

root. DIANA operates in opposite directions, that is, it begins with the root and divides this into smaller clusters at each subsequent step. In other words, HAC groups data objects in a bottom-up procedure, whereas DIANA groups them in a top-down manner. This research used HAC, since it is better in identifying smaller clusters (Kassambara, 2017).

The distance, or similarity, between each pair of observations was calculated by using the hamming distance measure. The hamming distance is the number of positions at which two strings of equal length differ. For example, the hamming distance between the strings '000' and '100' is 1, whereas between '000' and '120' the hamming distance is 2. To calculate the hamming distance between each pair of business model designs, the designs were first coded according to the coding scheme shown in Table 2. Each business model design was now expressed as a 25-character string, with each character representing a BMC variable. Next, a dissimilarity matrix was created by calculating the hamming distance between each pair of business model designs.

Additionally, to determine the dissimilarity between two clusters of observations, the complete-linkage criterion was used. This criterion defines the distance between two clusters as the maximum value of all pairwise distances between the elements in cluster 1 and the elements in cluster 2, and is often preferred for HAC clustering (Kassambara, 2017). Moreover, the agglomerative coefficient (AC) – a measure for the strength of the clustering structure – was fairly high for the complete-linkage criterion (.82), thus suggesting a balanced clustering structure. The abovementioned steps eventually resulted in a dendrogram (i.e. a hierarchical tree structure), showing the hierarchy of similarities among all pairs of observations (Romesburg, 2004).

Finally, the optimal number of clusters was determined on the basis of both visual inspection and the gap statistic method. Visual inspection was performed by the researcher and involved examination of the dendrogram for natural clusters, which are indicated by relatively dense branches (Ketchen & Shook, 1996). The gap statistic method is a statistical test to determine the optimal number of clusters in a data set. The exact functioning of this algorithm goes beyond the scope of this research, see (Tibshirani, Walther, & Hastie, 2001) for a further explanation.

A detailed description of the clusters that emerged from this analysis, including their business performance, is given in the results section of this research.

3.4.2. Regression analyses

To analyse the relationship between business model proximity and business performance, a set of regression analyses were conducted. The performance measures that were used as outcome variables included longevity, traffic and business size. For the predictor variables, three different measures for business model distance were formulated; average hamming distance, minimum hamming distance, and the minimum hamming distance quotient. The average hamming distance reflected the average distance an initiative had to all other initiatives and was calculated by dividing the sum of hamming distances of an initiative to all other initiatives by the total number of initiatives. Minimum hamming distance reported the smallest observed hamming distance between an initiative and all the other initiatives. For the last predictor variable, the minimum hamming distance quotient, the minimum hamming distance was divided by its frequency of occurrence. To illustrate, if the smallest documented hamming distance was 4 and this distance was observed two times, the minimum hamming distance quotient would be 2. The scenario of a minimum hamming distance of 0 (i.e. which would result in meaningless outcomes), was mitigated by raising the minimum hamming distance with 1 by default.

To analyse the relationship between the distance measures and both an organisations' longevity and traffic, multiple linear regressions were performed. A negative relationship was expected to exist for both outcome variables. Put differently, higher values of the distance measures were expected to result in lower longevity and traffic.

An ordinal logistic regression was performed to analyse the relationship between the distance measures and business size. Similar to the former regressions, this relationship was expected to be negative; higher values of the distance measures were expected to predict smaller business sizes.

4. Results

This section presents the results stemming from this study. First, an overall description is given of the Dutch peer economy by analysing the frequency of occurrence for each BMC variable. Next, the outcomes of the hierarchical cluster analysis are presented, thereby creating a taxonomy of business models and contributing to explaining the variety in the Dutch peer economy. Lastly, the results from the regression analyses, testing whether complexity theory predicted the level of success in the Dutch peer economy, are presented.

4.1. Descriptive results

Since presenting the values obtained for each individual variable would be monotonous and meaningless, this section highlights only the BMC variables that stood out from the data. That is, variables that were homogeneous for most initiatives. Frequency statistics for all the BMC variables are summarised in Table 4.

The final dataset described 88 unique peer economy initiatives, spanning a total of eight sectors; service (24), energy (1), food (4), mobility (12), goods (22), knowledge (6), logistics (4), and space (15). Of these 88 initiatives, only eight were found to be 'planet' incentivised, meaning that they put most weight on the ecological benefits that would result from joining their platform. Instead, it appeared that most peer economy platforms promoted the economic benefits of the peer economy. In other words, initiatives seem to believe more people can be attracted by emphasising the economic benefits of participating in the peer economy, rather than the ecological gains. This is interesting considering the role that P2P platforms are said to take in mitigating overconsumption.

Another interesting observation was made regarding trustworthiness. Earlier it was argued that trust is a fundamental component for transactions to take place amongst peers. Moreover, whereas traditionally such trust only existed between relatives and friends, digital platforms leverage several methods to create that trust between strangers. Such methods include the offering of a review system, verifying prospective users upon registration and offering insurance to users. However, the results of this study indicated that only public review systems were commonly used by Dutch peer economy initiatives, whereas screening and insurance were only offered by a minority of initiatives. Put differently, most initiatives established some basic form

of trust between users but did not maximise this relationship. This could imply that only a certain level of trust is required between strangers in order for them to transact.

In addition, only a minority of Dutch peer economy initiatives were found to have developed a native app as a channel to reach their users. This finding is interesting as it contrasts with the most well-known and successful peer economy examples (e.g. Airbnb, Uber and Blablacar), which do offer their users a native app. In general, native apps are said to be associated with high development and maintenance costs and require substantial financial resources (Dalmasso, Datta, Bonnet, & Nikaein, 2013; Willocx, Vossaert, & Naessens, 2016). Since such resources are often only available to large and well-funded firms, this suggests that most Dutch peer economy initiatives are small and medium sized platforms.

What is arguably most characteristic for the Dutch peer economy, is how platforms go about matching, algorithm and data collection. These values indicated that almost all platforms used passive matching to match supply and demand, while very few platforms used a complex algorithm or collected user data. Therefore, the Dutch peer economy is best characterized by unsophisticated platforms. This view is supported by the many low-cost initiatives that were observed amongst the Dutch peer economy initiatives.

To summarize, the Dutch peer economy is characterized by low-cost and simple platforms that establish only a basic level of trust, are not involved with matching supply and demand, do not offer a native app, and do not use a complex algorithm or collect user data. This finding is inconsistent with the understanding that most people have of the peer economy, namely large multinational platforms that use complex algorithms to match supply and demand and offer a state-of-the-art app.

4.2. Hierarchical Cluster Analysis

From the earlier described HCA, five groupings of business models were identified. This section describes each cluster based on the most characteristic BMC variables of that cluster. Note that the resulting descriptions do not account for the full variability within these clusters, but rather give the reader a general understanding of each cluster. Once the clusters have been described, this section continues with examining the business performance of each. Table 5 tabulates the distribution of BMC variables for each cluster, whereas a visualization of the formed clusters can be found in Appendix C.

4.2.1. Cluster 1

Very few initiatives in this cluster were found to operate a native app to reach their users. As mentioned before, a native app is associated with high development and maintenance costs, which in general cannot be afforded by small organizations with limited financial resources. Given that almost all initiatives in this cluster were found to have a low-cost structure, it is thus not surprising that very few of them had a native app. Another characterizing aspect of this cluster was that only a minority of initiatives had implemented mechanisms to increase trust between its users. This is an interesting observation, as it contradicts the assumption that all transactions require a basic level of trust between users in order to occur. Moreover, few initiatives in this cluster were established by founders with prior entrepreneurial experience. That is, most initiatives were founded by first-time entrepreneurs. Further characterizing this cluster were the limited partnerships observed.

In sum, most characteristic for this cluster were initiatives that: (I) did not have an app; (II) did not promote trust between users; (III) had inexperienced founders; and (IV) did not engage in partnerships. This combination of characteristics portrays small and non-professional initiatives. Tuintjedelen, for example, is a platform that connects gardeners looking for a garden with garden owners who would like to get more out of their garden. Gardeners and garden owners approach each other using a simplistic website and engage with each other without regard of their trustworthiness. Moreover, the platform does not engage in any form of partnerships and its founder had no prior entrepreneurial experience.

4.2.2. Cluster 2

Most characteristic for this cluster was the almost exclusive use of subscriptions as a revenue generation mechanism. Moreover, a slight majority of initiatives were found to be “people” platforms. This is an interesting observation, as it suggests that people pay for a service without directly benefiting from it economically. For example, Connectingfriends.net charges users a small monthly fee to participate in the network, but the benefits of participation are not financial. Instead, the platform focuses on increasing social cohesion by facilitating meetings between strangers. In other words, people pay with the goal of increasing social capital as opposed to financial capital. In addition, it was found that initiatives in this cluster were most often backed by an investor.

In short, most characteristic for this cluster were initiatives that: (I) used subscriptions as revenue generation mechanism; (II) focused on social capital; and (III) were backed by an investor. An example typifying this cluster is Couchsurfing; a platform that facilitates travellers by finding lodging with local residents. An important aspect of this platform is that guests do not pay hosts for the received accommodation. Instead, members pay a monthly fee to Couchsurfing which gives them unlimited usage of the platform. Accordingly, users of this platform do not join for monetary reasons, but rather to increase their social capital. Lastly, Couchsurfing is funded by multiple venture capitalists.

4.2.3. Cluster 3

A first observation of this cluster was that planet and people platforms collectively represented a larger share of initiatives than profit platforms. Put differently, the focus of the initiatives in this cluster are mostly not-for-profit. Further characterizing this cluster were the relatively many initiatives that relied on indirect revenue generation mechanisms – income from sources other than the primary operations of a business (e.g. donations and advertising). Interestingly, these two characteristics are often associated with non-profit organizations (NPOs). Moreover, since the creation of profits is not the main objective of NPOs, they are typically less appealing for traditional profit-seeking investors. Indeed, only two initiatives in this cluster were found to be backed by investors. Yet, the results indicated that a majority of initiatives in this cluster had strategic partnerships. This suggests that the initiatives in this cluster relied more on their partners' non-cash assets and skills to achieve their overall objectives than their partners' monetary assets. A final observation was that many founders in this cluster had prior entrepreneurial experience.

To summarize, most characteristic for this cluster were initiatives that: (I) did not value financial capital over social and natural capital; (II) relied on indirect revenue generation mechanisms, such as donations; (III) were not funded by an investor; (IV) engaged in strategic partnerships; and (V) were started by experienced entrepreneurs. A typical example of such initiative is Takecarebnb. The mission of this initiative is to find temporary housing for refugees with a residence permit by connecting them with Dutch host families. Takecarebnb is not funded by investors, but instead relies on donations as its main source of income. Moreover, it has established various strategic partnerships that aid Takecarebnb in achieving its mission. Lastly, Takecarebnb's

founder had already engaged in other entrepreneurial activities prior to founding this initiative.

4.2.4. Cluster 4

Most characteristic for this cluster was the wide adoption of trust increasing mechanisms. All the initiatives were found to use at least two mechanisms to promote trust between its users, whereas a majority of initiatives even used all three mechanisms. This suggests that initiatives in this cluster facilitated transactions with high risks associated with them, for which additional assurances are required by users. Indeed, upon further inspection, the transactions facilitated by initiatives in this cluster involved peoples' homes (e.g. Airbnb), cars (e.g. Snappcar), and boats (e.g. Barqo) amongst others. Such objects are of considerable value to people and are unlikely to be shared with strangers without first offering some assurances to owners or establishing trust between users. Further characterizing this cluster were the many initiatives operating an active customer service. Providing users with almost immediate feedback when they have questions or run into problems, can be another measure to further assure users and lower the perceived risk. Finally, a last characteristic of this cluster was that almost all initiatives were founded by experienced entrepreneurs.

In sum, most characteristic for this cluster were initiatives that: (I) promoted trusts amongst its users; (II) operated an active customer service, and (III) had founders with prior entrepreneurial experience.

4.2.5. Cluster 5

Within this cluster many initiatives were found to operate a native app. Considering the high financial costs associated with the development and maintenance of native apps, this finding would suggest that initiatives in this cluster had access to substantial amounts of financial resources. Indeed, the results indicated that a majority of initiatives were funded by investors and are thus likely to be well-financed. Moreover, the many high-cost structures observed suggests that this cluster contained large initiatives in terms of employees and offices. In addition, it is also an additional indicator for an organizations' financial status. That is, organizations with a large number of employees and large offices in general have access to more financial resources. Further describing this cluster was the high percentage of initiatives that reached their users by means of a blog.

Altogether, most characteristic for this cluster were initiatives that: (I) operated an app, (II) were funded by investors, (III) had high-cost structures, and (IV) used a blog to reach its users. Typical examples of this cluster include Etsy and Uberpop. Both are examples of large modern organizations that rely heavily on a state-of-the-art app and a blog to engage with their users. In addition, both initiatives are funded by a great number of investors.

Table 5.

Overview of Variable Distribution for the Identified Clusters

		Cluster				
Variables	Values	*1*	*2*	*3*	*4*	*5*
Customer Segment	On-demand	46%	57%	47%	39%	61%
	Sharing	50%	43%	29%	57%	8%
	Second-hand	4%	0%	24%	4%	31%
Active customer support	Yes	29%	43%	12%	65%	62%
Terms & conditions	Yes	86%	86%	88%	96%	100%
Newsletters	Yes	57%	86%	76%	70%	38%
App	Yes	14%	29%	29%	39%	85%
Blog	Yes	68%	71%	12%	83%	92%
Value offering	Profit	61%	43%	47%	91%	77%
	Planet	11%	0%	24%	0%	8%
	People	28%	57%	29%	9%	15%
Matching	Passive	100%	100%	94%	91%	77%
	Active	0%	0%	6%	9%	8%
	Real-time	0%	0%	0%	0%	15%
Screening	Yes	32%	14%	0%	78%	77%
Insurance	Yes	0%	0%	12%	96%	8%
Review system	Yes	39%	71%	41%	96%	77%
Algorithm	Yes	0%	29%	0%	3%	15%
Data collection	Yes	0%	14%	0%	3%	23%
Founders experience	Yes	21%	57%	82%	91%	62%
Insurer	Yes	4%	0%	12%	83%	0%
Investor	Yes	29%	86%	12%	74%	85%
Strategic partnership	Yes	21%	14%	76%	70%	77%
Transaction fee	Yes	64%	0%	18%	91%	85%
Subscription	Yes	7%	86%	24%	9%	15%
Set price	Yes	4%	14%	0%	0%	0%
Donations	Yes	18%	0%	41%	0%	0%

Table 5 (continued).

Advertising	Yes	0%	14%	6%	0%	0%
Licensing	Yes	0%	0%	6%	0%	8%
Freemium	Yes	0%	0%	18%	0%	8%
Fixed costs	High	4%	43%	0%	48%	77%
N		28	7	17	24	13

4.2.6. Cluster business performance

In addition to describing the clusters in terms of their most distinctive characteristics, observations were also made with regard to the performance of the clusters. To assess cluster performance, data on the three earlier specified success variables (i.e. longevity, traffic, and business size) was collected for each initiative. Activity was used as an additional indicator of success in this analysis and reflected whether an initiative still existed. The results of the analysis are summarized in Table 6.

A first observation was that the first grouping of peer economy business models scored lowest on all success variables. That is, compared to the other clusters, initiatives in the first cluster existed shortest, attracted the least traffic and were smallest in size. Moreover, this cluster contained the highest amount of initiatives that had ceased to exist. This could suggest that these initiatives combined incompatible business models elements, which resulted in incoherent business models and thus lower performance. In particular, the lack of founder experience may well relate to low performance.

Another observation was that the fifth cluster stood out in terms of performance. This was already expected due to the many initiatives that had an app and were funded by investors. That is, the development of a native app is considered a costly endeavour for organizations and is therefore only expected to be done by successful organizations. Moreover, investors in general only invest in organizations with a high potential for success. This finding could indicate that these initiatives combined the most compatible business model elements, leading to the highest performance.

The second, third and fourth clusters scored very similarly in terms of their business performance. More specifically, they all performed averagely; better than the first cluster, but less than the fifth cluster.

These observations combined imply that there are multiple peer economy business model designs that result in success. Namely, four of the five business model

clusters had high levels of performance. Therefore, the analysis provides evidence for the first hypothesis that the Dutch peer economy is characterized by a few high performing business models.

Table 6.

Summary of Business Performance per Cluster

	Cluster 1 (n=28)	Cluster 2 (n=7)	Cluster 3 (n=17)	Cluster 4 (n=23)	Cluster 5 (n=13)
Active	12	6	14	20	11
Percentage active	43%	86%	82%	87%	85%
Average longevity (months)	58	104	93	78	107
Average traffic (visitors/month)	2,678	9,228	29,472	79,732	4,747,869 (420,203)[a]
Employees (mode)	2-10	2-10; 11-50	11-50	11-50	51-200

[a] without Marktplaats

4.3. Regression analyses

Before the main analyses were executed, all relevant assumptions were checked for. Since the residuals of both longevity and traffic were not normally distributed, a log transformation was performed on both dependent variables. The other assumptions for multiple linear regression (i.e. homoscedasticity, absence of multicollinearity, and linearity) were met. In addition, the assumptions for ordinal logistic regression (i.e. parallel lines, multicollinearity) were also met. Table 7 provides the descriptive statistics and correlation matrix.

First, two multiple linear regressions were carried out. One to ascertain the extent to which the distance measures (i.e. average hamming distance, minimum hamming distance, and minimum hamming distance quotient) predicted longevity, and one to do the same for traffic. The results of these analyses are summarised in Table 8 and Table 9. Next, an ordinal logistic regression was conducted to ascertain the relationship between the distance measures and business size. The results of this analysis are tabulated in Table 10.

Table 7.

Descriptive Statistics and Correlation Matrix

		Mean	S.D.	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)
(1)	Log(longevity)	1.85	.24	1.20	2.52	-					
(2)	Log(traffic)	3.64	1.42	.48	7.68	.40	-				
(3)	Business size	2.63	1.08	1	7	.37	.66	-			
(4)	Average hamming distance	8.48	1.03	6.90	11.63	.19	.26	.30	-		
(5)	Minimum hamming distance	2.56	1.51	0	7	.18	.26	.09	.58	-	
(6)	Minimum hamming distance quotient	2.35	1.52	.50	8.00	.30	.24	.18	.47	.55	-

4.3.1. Longevity

Results of the multiple linear regression indicated that there was a collective significant effect between the average hamming distance, minimum hamming distance, minimum hamming distance quotient, and the longevity of an organization ($p<.05$). The individual predictors were further examined and indicated that average hamming distance ($p=.66$) and minimum hamming distance ($p=.97$) were not significant predictors in the model. Moreover, the minimum hamming distance quotient ($p<.05$) did significantly predict the number of months an organization existed. However, the coefficient of this relationship was positive, thus suggesting that distant business models predicted longer existence than proximate business models.

Table 8.

Results of the Multiple Linear Regression for Longevity

Predictor	*B (SE)*	*β*	*t*	*F*	*df*	*p*	R_2	*Adj.* R_2
Longevity (N = 86)				2.750	3, 82	.048**	.091	.058
Average hamming distance	.014 (.031)	.059	.443					
Minimum hamming distance	-.001 (.022)	-.005	-.033					
Minimum hamming distance quotient	.045 (.021)**	.273	2.123					

Note. SE = standard error
* p < .10, ** p < 0.05, *** p < 0.01

4.3.2. Traffic

A collective insignificant effect was found between the average hamming distance, minimum hamming distance, minimum hamming distance quotient, and traffic (p=.13). Moreover, average hamming distance (p=.34), minimum hamming distance (p=.46), and the minimum hamming distance quotient (p=.61) were not identified as significant predictors in the model.

Table 9.

Results of the Multiple Linear Regression for Traffic

Predictor	*B (SE)*	*β*	*t*	*F*	*df*	*p*	R_2	*Adj.* R_2
Traffic (N = 62)				1.937	3, 58	.134	.091	.044
Average hamming distance	.201 (.209)	.151	.960					
Minimum hamming distance	.115 (.156)	.123	.740					
Minimum hamming distance quotient	.072 (.140)	.084	.513					

Note. SE = standard error
* p < .10, ** p < 0.05, *** p < 0.01

4.3.3. Business size

Only the average hamming distance predictor variable was found to significantly contribute to the model (p<.05). The estimated odds ratio favored a positive relationship of more than twofold for every one unit increase of average hamming distance. In other words, organizations with a greater average hamming distance, were more likely to have more employees.

Table 10.

Results of the Ordinal Logistic Regression for Business Size

Predictor	Business size (N = 75)					
	Odds (B)	S E	Wald	df	OR	95% CI
Average hamming distance	.86**	.29	8.63	1	2.36	(.29, 1.43)
Minimum hamming distance	-.18	.20	.79	1	0.84	(-.57, .21)
Minimum hamming distance quotient	.06	.18	.11	1	1.06	(-.29, .41)

Note: R_2 (Cox and Snell) = .17
SE = standard error; OR = odd ratio; CI = confidence interval
* p < .10, ** p < 0.05, *** p < 0.01

In sum, none of the performed tests produced evidence in support of the second hypothesis that business model proximity predicted higher levels of business performance. In fact, the results indicated a relationship to exist in the opposite direction. That is, more unique business models predicted higher levels of business performance.

4.4. Robustness check

From the former regression analyses it can be inferred that the hypothesis cannot be accepted. That is, no significant evidence was found that would indicate that business model proximity results in higher business performance. However, this section presents the results of additional analyses that were performed to test whether the hypothesis held if variables were excluded from the business model.

In order to operationalize the BMC in a meaningful manner, it was necessary to abstract the value proposition into a limited number of categories. Yet, by doing so, the resulting categories might have been too general in describing a firms' value proposition, thereby possibly not accounting for the various value propositions actually observed in the sample. Considering this, the value offering variable was excluded from the BMC operationalization.

Another variable that was taken out of the former BMC operationalization, was 'founders experience'. Prior entrepreneurial experience of founders, also known as pre-entry experience, is said to be a pivotal determinant of firms success (Bayus & Agarwal, 2007; Ganco & Agarwal, 2009). That is, founders with prior entrepreneurial experience are more likely to be met with positive entrepreneurial outcomes compared to inexperienced founders. Moreover, it could be argued that the prior experience of founders is not an asset inherent to the firm (i.e. it leaves when the founder leaves), and therefore should be analyzed in isolation of the business model.

The additional analyses followed the same procedure as explained and performed before, only this time without the abovementioned variables. Table 11 shows the descriptive statistics and correlation matrix.

Table 11.

Descriptive Statistics and Correlation Matrix

		Mean	S.D.	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)
(1)	Log(longevity)	1.85	.24	1.20	2.52	-					
(2)	Log(traffic)	3.64	1.42	.48	7.68	.40	-				
(3)	Business size	2.63	1.08	1	7	.37	.65	-			
(4)	Average hamming distance	7.50	0.99	5.82	10.46	.24	.29	.33	-		
(5)	Minimum hamming distance	2.10	1.30	0	6	.17	.29	.10	.57	-	
(6)	Minimum hamming distance quotient	1.86	1.15	.50	7.00	.34	.06	.19	.54	.46	-

4.4.1. Longevity

The results of the repeated analysis on longevity were very similar as before. Namely, that the model significantly predicted the longevity of an organization ($p<.05$), whereas the minimum hamming distance quotient was again the only significant predictor of longevity ($p<.05$). Moreover, the coefficient of this relationship was again positive, thus suggesting that distant business models predicted longer existence than proximate business models. Table 12 tabulates the results of the new analysis on longevity.

Table 12.

Results of the Additional Multiple Linear Regression for Longevity

Predictor	*B (SE)*	*β*	*t*	*F*	*df*	*p*	R_2	*Adj.* R_2
Longevity (N = 86)				3.679	3, 82	.015**	.119	.086
Average hamming distance	.022 (.033)	.089	.652					
Minimum hamming distance	-.004 (.024)	-.021	-.161					
Minimum hamming distance quotient	.063 (.026)**	.299	2.373					

Note. SE = standard error

* p < .10, ** p < 0.05, *** p < 0.01

4.4.2. Traffic

By excluding value offering and founders experience, the new model was found to significantly predict traffic ($p<.05$). The results of the traffic model in Table 13 show that the coefficients of minimum hamming distance and the minimum hamming distance quotient were insignificant. The repeated analysis on traffic, however, now

indicated average hamming distance to significantly predict business performance (p<.1). Yet, this relationship was positive, suggesting that unique business models attracted more monthly visitors than proximate business models.

Table 13.

Results of the Additional Multiple Linear Regression for Traffic

Predictor	*B (SE)*	*β*	*t*	*F*	*df*	*p*	R_2	*Adj.* R_2
Traffic (N = 62)				3.138	3, 58	.032**	.140	.095
Average hamming distance	.403 (.221)*	.289	1.824					
Minimum hamming distance	.258 (.156)	.243	1.654					
Minimum hamming distance quotient	-.251 (.175)	-.221	-1.437					

Note. SE = standard error
* p < .10, ** p < 0.05, *** p < 0.01

4.4.3. Ordinal Logistic regression

The new analysis led to very similar results as the former regression analysis. Again, average hamming distance was the only predictor variable to significantly contribute to the model (p<.05). The estimated odds ratio favored a positive relationship of over twofold for each unit increase of average hamming distance. This stands in contrast with the hypothesis of this research, which expected a significant negative relationship to exist. Table 14 summarizes the results of the second ordinal logistic regression.

Table 14.

Results of the Additional Ordinal Logistic Regression for Business Size

Predictor	Business size (N = 75)					
	Odds (B)	S E	Wald	df	OR	95% CI
Average hamming distance	.93**	.32	8.81	1	2.53	(.32, 1.56)
Minimum hamming distance	-.19	.21	.81	1	0.83	(-.61, .23)
Minimum hamming distance quotient	.08	.24	.11	1	1.08	(-.39, .54)

Note: R_2 (Cox and Snell) = .19
SE = standard error; OR = odd ratio; CI = confidence interval
* p < .10, ** p < 0.05, *** p < 0.01

To conclude, after the exclusion of the value offering and prior experience variables from the analyses, still no evidence was produced that would support the hypothesis.

Where a negative relationship was expected to exist between business model proximity and business performance, the results of this study instead indicated a positive relationship to exist. In other words, high business performance was predicted for initiatives with a unique business model.

5. Conclusion and discussion

5.1. Overview of the main results

The objective of this research was to address the question: '*How can the variety and success of peer economy business models in the Netherlands be explained?*'. To explain the variety of peer economy business models, this research adopted an exploratory approach. Grounded in the contemporary theories on both the peer economy and business models, and by means of inductive categorisation, 25 variables were identified as attributes of peer economy business models. These variables were then leveraged for the application of an HCA methodology, resulting in the discovery of five peer economy business model clusters (Appendix C).

The first cluster portrays non-professional organizations. Initiatives in this cluster have only limited financial resources, are inexperienced, do not engage in partnerships and are generally unsuccessful. The second cluster portrays subscription-based organizations, focus on social capital and tend to have multiple funding sources. The third cluster portrays non-profit organizations that tend to rely on indirect revenue models and have experienced founders. The fourth cluster portrays platforms facilitating high-risk transactions. Initiatives in this cluster implement various trust promoting mechanisms (e.g. public review system), operate an active customer service, and have experienced founders. The second, third and fourth clusters are all moderately successful. The fifth and final cluster portrays professional and the most successful platforms. These initiatives heavily rely on technology (e.g. app), have professional communications and are well funded by investors.

Regarding the first hypothesis stating (*The Dutch peer economy is characterized by a few high performing business models*), it was found that four out of the five clusters performed relatively well, whereas only one cluster represented low performing peer economy initiatives. This finding supports the first hypothesis and indicates that successful business models cluster together and form local optima. Regarding the second hypothesis (*Business model proximity predicts higher levels of business performance*), statistical tests indicated that business model distance positively affects business performance. This would imply that when the business model of an organization becomes more distant from other business models, the duration of existence and workforce of that organization also increases. A robustness check further confirmed this outcome. Thus, contrary to the hypothesized association, this study finds that business model proximity predicts lower levels of business

performance. Seemingly, organizations with a unique business model may well perform better than those with similar business models.

To conclude, this study offers general insights into the structure of the peer economy sector in the Netherlands by establishing a taxonomy of business models that are used by peer economy initiatives. Accordingly, this study found that the variety in the Dutch peer economy can be explained according to five groups of business models. With regard to the success of peer economy business models, this study produced no convincing evidence that success can solely be explained by the complementarities that exist between business model dimensions (e.g. complexity theory). However, this does not necessarily mean that the complementarities of business model elements do not play a role in determining success, but rather indicates that other factors should also be considered.

5.2. Reflection

Although this study is the first study to investigate the structure of the peer economy sector in the Netherlands, some of its findings are consistent with those of research in related fields. In a recent study into the business model categories of the sharing economy, Ritter and Schanz (2019) identified subscription-based models as one of the four distinguishing sharing economy business models. Their finding is consistent with one of the clusters identified in the current research, that also describes subscription-based models. Similarly, the finding of a high technology reliant, well-funded cluster in the current research, matches with one of the sharing economy business model typologies discovered by Muñoz and Cohen (2017). Since the sharing economy is aggregated under the peer economy, such overlapping findings are not surprising and even expected.

The results of the cluster analysis partially confirm the first hypothesis that successful business models are expected to cluster together and form local optima. However, the assumption that each optimum reflects one single specific business model design is not confirmed. Rather, the local optima consisted of a collection of business models that were very similar but not identical. Put differently, from the results it can be inferred that successful business models cluster together. Yet, the resulting clusters do not represent a single business model design, but rather represent a set of business models that are similar. A first explanation for this could be that the peer economy has not yet reached the mature industry phase (Klepper,

1997). This hypothesis assumed that initiatives, through the process of hill-climbing, would have reached an optimum. However, considering the novelty of the peer economy, it is more likely that most initiatives are still in the process of optimizing their business models; they are still climbing the hill. This would explain why no dominant business model designs emerged from the analysis. Nonetheless, such optimal business model configurations could still surface when the industry becomes more mature. Another explanation could be that this study used too many variables to capture the nine dimensions of the BMC. The total number of possible designs depends on the total number of possible combinations between the states of elements (Frenken, 2006). Accordingly, as the number of elements (and their states) increase, so does the total number of possible designs. For example, a system consisting of 25 binary elements (0 or 1) already has over 30,000 (2_{25}) possible combinations. However, some of the variables of the BMC could assume more than two states, thereby further increasing the number of possible combinations. With so many possible business model configurations, it is not surprising that few firms have the exact same business model.

The lack of evidence in support of the second hypothesis could possibly be explained by the network effects associated with platform-mediated networks (Eisenmann, Parker & Alstyne, 2007). Network effects are the incremental benefit gained by users of a network for every new user that joins the network. For peer economy platforms, a platform becomes more valuable for users if more suppliers join that platform, and vice versa (so-called 'two-sided network effects'). These network effects cause a firm's market share dominance to increase and eventually may cause a platform to pull away from its rivals in popularity once it has gained an initial edge, also known as tipping (Dubé, Hitsch, & Chintagunta, 2010; Katz & Shapiro, 1994). The result is a market in which platforms with the largest userbases survive, also known as 'the winner takes it all'. Platforms that fail to increase their market share either have to adapt their business model, are acquired by their more successful competitor, or cease to exist. Therefore, the most successful platforms may actually be ones that are quite distinct from the others, as they have outcompeted them.

A good example of a Dutch peer economy initiative that controls almost their entire sector, is Marktplaats. Founded in 1999, Marktplaats was one of the first online marketplaces in the Netherlands and quickly attracted a large userbase to its platform. Due to their first mover advantage (e.g. large userbase), Marktplaats soon became

the most attractive platform for users to buy and sell their products and services. That is, your advertisement has the largest exposure. Moreover, as Marktplaats' userbase grew it became increasingly difficult for alternative online marketplaces, with similar business models but less users, to compete. Therefore, due to the network effects inherent to platform-mediated networks, firms are not expected to imitate Marktplaats' business model. Indeed, none of the initiatives in this study were found to operate an identical business model to that of Marktplaats. Moreover, the most proximate business models, at a distance of eight, differentiated themselves from Marktplaats by focusing on a specific niche. United wardrobe, for example, is an online marketplace concentrated specifically on second-hand fashion.

5.3. Contributions

This research provides useful insights into the structure of the peer economy sector in the Netherlands. Based on the insights obtained in this research, other researchers are enabled to understand the business models used by peer economy initiatives and can focus their research by choosing specific groups of the resulting clusters for further examination. Moreover, this research contributes to the sustainable business model literature by responding to a call for papers on the mechanisms driving successful sustainable business models (Dentchev et al., 2016). Although the findings of this study were unexpected, they still enhance the understanding of (un)successful sustainable business models and offer directions for further research.

Besides its theoretical contributions, policy makers also stand to gain from the findings of this research. Currently, regulatory gaps concerning sharing business models exist as organizations in the peer economy operate under a regulatory framework that was not specifically designed for them (Kenney & Zysman, 2015; Makela, McKee, & Scassa, 2018; Selloni, 2017). Further worsening the issue is that these platforms are innovating much faster than the regulatory authorities can adapt, causing policy makers to trail even further behind (Frenken, van Waes, Pelzer, Smink, & van Est, 2019). This study tries to fill this void by establishing an empirical taxonomy and demonstrating diversity and success within peer economy business models. Such understanding of the peer economy will help policy makers with identifying the implications of different business models and allows more fine-grained regulations to be created, instead of painting all peer economy activity with the same brush (Muñoz & Cohen, 2017). By distinguishing between different P2P business models, policy

makers can now impose regulations that encourages certain business models and discourages others. For example, business models that focus on the creation of social and environmental capital should typically be encouraged, whereas business models that only create financial capital should be discouraged.

Lastly, the findings of this study can help practitioners with the design of their business models, as both successful and unsuccessful peer economy business model configurations were identified. By using this knowledge, organizations can take a 'short-cut' in their search for higher performing business models and avoid underperforming business models altogether.

5.4. Limitations and further research

Like most scientific research, this research suffers from several limitations and raises novel avenues for further research.

Theoretically, one can point to limitations of complexity theory in general and the NK-model used in this thesis in particular. This study considered the business model as a complex system consisting of nine components with epistatic relationships in between them. Following the NK-model, the components and their relationships were assumed to be undifferentiated. However, Manson (2001) argues that the internal structure of a complex system is defined by the differing strengths in relationships between its components. Therefore, including the strength of the epistatic relationships might result in different findings, which may also shed a new light on the unexpected finding that more unique business models tend to perform better.

An empirical limitation was the small sample size. Although this study used the most comprehensive list of peer economy initiatives in the Netherlands and the size of the sample met the minimum requirement for the adopted quantitative methods, a larger sample would produce more accurate results and increase the generalizability of this study. Since there are only a limited number of peer economy initiatives in the Netherlands, a larger sample could be obtained by broadening the geographical scope of this study and include initiatives from outside the Netherlands.

A second limitation concerns the techniques used for the data collection. Information about an organizations' business model was primarily gathered using indirect sources, such as their public website. Even though document analysis is said to have advantages (e.g. efficiency and cost-effectiveness) in relation to other research

methods, it also has its limitations (e.g. insufficient detail) and is recommended to be used in combination with other data sources (Bowen, 2009). For example, the data obtained from the document analysis could have been enriched and validated by conducting case studies with selected companies from the sample.

This study is further limited by the use of non-financial business performance indicators. Ideally, the performance of an organization would be measured using financial indicators (e.g. net profit or return on investment) as they are more objective and accurate. However, data on these indicators is rarely publicly accessible and therefore difficult to obtain.

A last limitation concerned the results obtained for the traffic performance indicator. Since organic traffic information was gathered during the COVID-19 pandemic, it is possible that they are higher or lower than what they typically would have been. For example, ShareDnD – an initiative that lets people organize living room diners for other people – is likely to have received fewer monthly visitors than it normally would. Retrospectively, it would be better to use the average visitors over a longer period of time or the yearly visitors, as opposed to only one month. It should also be noted that traffic generated through app use was not included due to lack of availability. Nonetheless, the effect of these limitations on this study was controlled for with the inclusion of the other two performance indicators (e.g. longevity and business size).

A first opportunity for future research would be to apply this study in additional countries. Due to the geographical scope and the small sample used in this study, the findings only account for peer economy business models in the Netherlands. Reproducing this study in other countries can provide insights about whether similar results are obtained in different contexts, and thus about the generalizability of the findings.

Moreover, future research could include additional measures of business performance. Considering the social and environmental benefits ascribed to the peer economy, performance of peer economy initiatives can also be measured along these two dimensions. Put differently, the success of a peer economy initiative is not only determined by its financial performance, but also by its social and environmental performance. An initiative with low financial performance can still be successful as its social and environmental performance are high. By including these performance measures, new insights regarding success in the peer economy could be obtained.

It would also be interesting to look into the dynamics of the business model change in future research. The current study captured a static image of the business models of peer economy initiatives and assumed these models to be reached through the process of hill-climbing. Future in-depth case studies could provide evidence for this assumption by documenting how the business models of initiatives have changed over time. In addition, it could also provide valuable insights into the motives of entrepreneurs for choosing a certain business model.

A last avenue for future research could be to look into businesses that operate multiple business models concurrently, also known as business model diversification (Guyader & Piscicelli, 2019). Operating multiple business models at once is argued to be a challenging undertaking for organizations (Casadesus-Masanell & Tarzijan, 2012). On the one hand, business models can work in synergy and mutually reinforce each other, thereby increasing the organizations' competitiveness and performance (Guyader & Piscicelli, 2019). On the other hand, they can be in direct conflict and result in resource dilution or cannibalization of the original model (Aversa, Haefliger, & Reza, 2017). Yet, an organization that "recognizes which models are substitutes that must be kept separate and which are complements that strengthen each other can build a uniquely sustainable competitive advantage" (Casadesus-Masanell & Tarzijan, 2012). Accordingly, future research can aid practitioners by investigating which business models can be combined and which cannot.

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Appendix A

Overview of sources

Table A.

Overview of sources used per variable.

		Social media and public website	Press and news articles	LinkedIn	SEMrush	Online data aggregators
BMC Variables	Customer segment	X				
	Active customer support	X				
	Terms and conditions	X				
	Newsletters	X				
	App	X				
	Blog	X				
	Value offering	X				
	Matching	X				
	Screening	X				
	Insurance	X				
	Review system	X				
	Algorithm	X	X			
	Data collection	X				
	Founders experience		X	X		
	Insurer	X	X			X
	Investor	X	X			X
	Strategic partnership	X	X			X
	Transaction fee	X	X			
	Subscription	X	X			
	Set price	X	X			
	Donations	X	X			
	Advertising	X	X			
	Licensing	X	X			
	Freemium	X	X			
	Fixed costs	X	X			
Success variables	Longevity	X	X	X		
	Organic traffic				X	
	Business size			X		

Appendix B

Overview of initiatives

Table B.

Overview of initiatives included and excluded in the dataset.

Initiative	Included	Included under assumption	Excluded	Comment
AnyJobby	X			
Buurhondje	X			
ConnectingFriends.net	X			
Dienst4dienst	X			
Helpling	X			
Hi,Hi Guide	X			
Hulpje.nl		X		Assumption: no data collection
Jobado	X			
Klusup	X			
Sitly	X			
Pawshake	X			
Petbnb	X			
Qare			X	Too little information available
WithLocals	X			
Vandebron	X			
ShareDnD	X			
EatToMeet	X		X	Too little information available
EatWith				
Mealby			X	Too little information available
MeetJune (food)	X			
Barqo	X			
Bed&Wheels		X		Assumption: no user verification
Bksy	X			
Boatbuzz			X	Too little information available
Bookmatch	X			
Caravandelen.nl	X			
De Kleding Bibliotheek			X	Too little information available
Spullenier			X	Too little information available
Deelit	X			
Etsy	X			
GoBoat	X			

Initiative	Included	Included under assumption	Excluded	Comment
Goboony	X			
Gratisaftehalen.nl	X			
Huren van Buren	X			
iKringloop	X			
Jipio (exchange)	X			
KrijgdeKleertjes	X			
Marktplaats	X			
Peerbook			X	Too little information available
Peerby (borrow)	X			
Rent from a Friend (product)		X		Assumptions: no founder experience and transaction fee
Rentsy	X			
Rewear			X	Too little information available
Ruilboek.nl			X	Too little information available
Ruilen.nl (product)	X			
Spull.nl			X	Too little information available
Spullendelen.nl	X			
Ticketswap	X			
United Wardrobe	X			
Buurtleren	X			
Honck	X			
Knoowy (service)	X			
Konnektid	X			
Stuvia	X			
Brenger	X			
Djeepo	X			
PickThisUp	X			
Sjipit	X			
BlaBlaCar	X			
Camptoo	X			
Motoshare	X			
ParkFlyRent	X			
SnappCar	X			
Spinlister	X			
UberPop	X			
AirBnB	X			

Initiative	Included	Included under assumption	Excluded	Comment
Campspace	X			
Couchsurfing	X			
Desktoday	X			
Holiday Link	X			
HomeforExchange	X			
Homelink.org		X		Assumption: no founder experience
Homeexchange	X			
Lovehomeswap	X			
Mobypark	X			
Nationalehuizenruil	X			
ParkU	X			
Tuintjedelen	X			
Charly Cares	X			
WeHelpen	X			
Automaatje			X	Too little information available
Buuv.nu		X		
Croqqer	X			
Fiksers	X			
HeelNederlandDeelt (service)	X			
Maboen	X			
Zoiizo.nl	X			
Thuisgekookt	X			
Seats2Meet for Locals			X	Too little information available
Seats2Meet for Locals			X	Too little information available
Takecarebnb	X			
NL voor elkaar	X			
HeelNederlandDeelt (rent)	X			
MeetJune (experiences)	X			
MeetJune (space)	X			
HeelNederlandDeelt (buy/exchange)	X			
Peerby (rent)	X			
Knoowy (summaries)	X			
Jipio (borrow)		X		
Rentfromafriend (service)		X		
Ruilen.nl (service)	X			

Appendix C

Dendrogram from cluster analysis

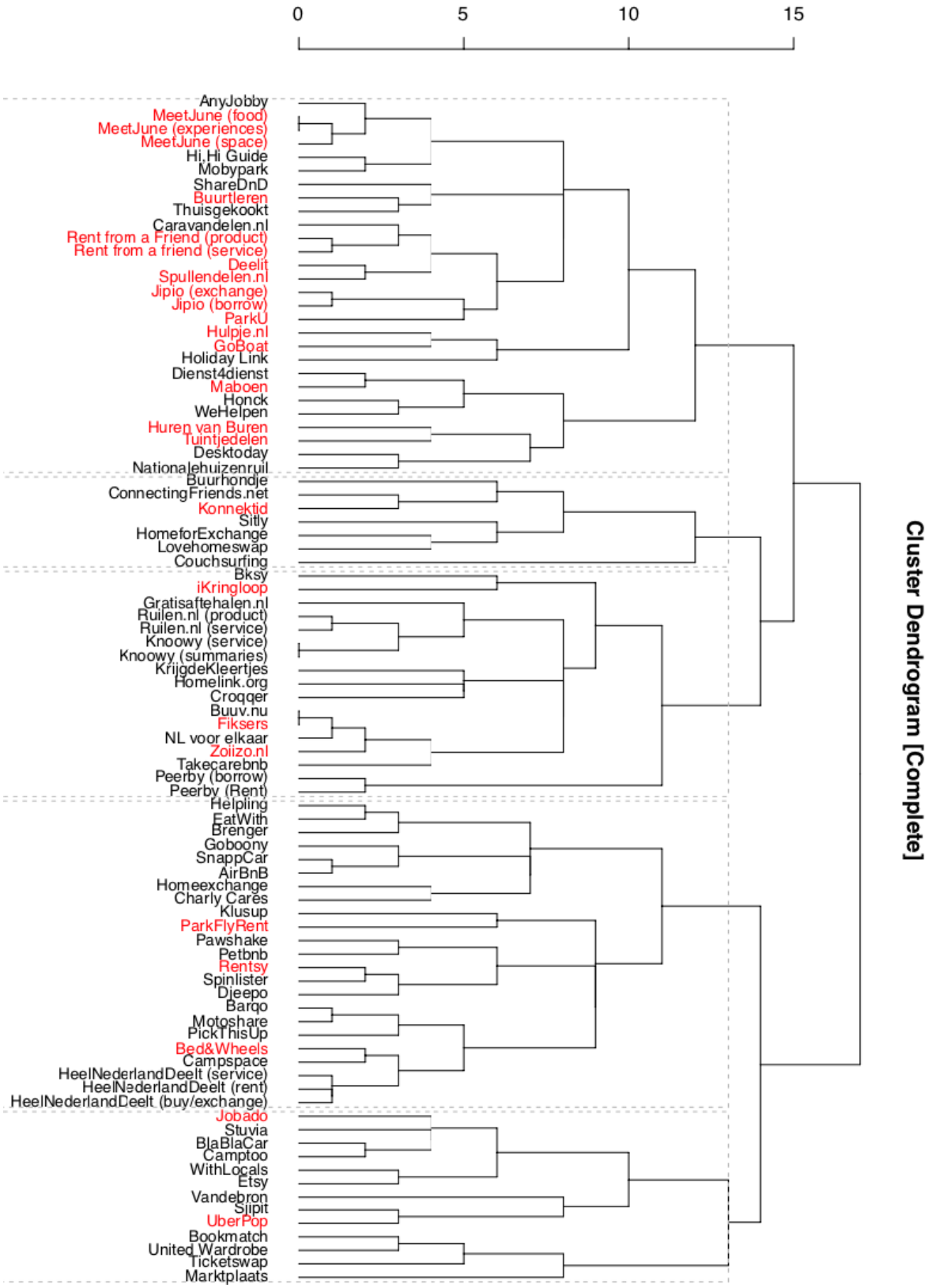

Figure C1. Resulting dendrogram from the cluster analysis. *Note:* red initiatives are inactive and dashed lines indicate the clusters.