



Paper

# Measuring online platforms

In cooperation with UvA



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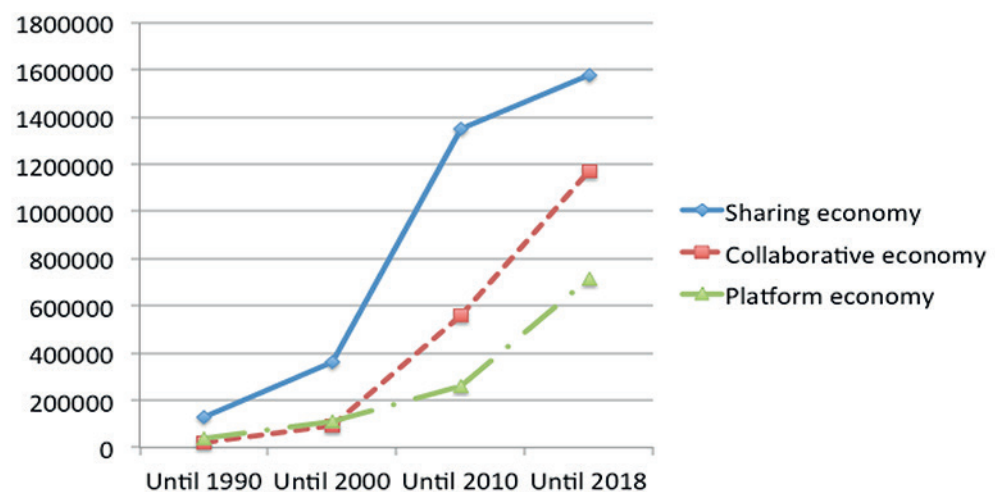
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# 1. Introduction

In general terms, online platforms can be seen as intermediaries between supply and demand of goods, services and/or information for actors such as individuals (among which consumers), businesses, science and government. Online platforms are a new phenomenon, which in the last ten years have become increasingly prevalent in different areas of society. Well-known examples are Airbnb (accommodation services), Amazon (market place), Uber (transportation services), Google (app development) and Facebook (social interactions). These online platforms offer, on the one hand, new (market) possibilities to businesses and benefits to consumers, enabling 'innovative forms of production, consumption, collaboration and sharing through digital interactions' (OECD, 2018, p. 7). At the same time, the rise of online platforms can have negative side effects. For example, they can disrupt entire industries, change labour conditions, put pressure on fair competition, cause privacy issues and can make it more difficult to raise taxes. Some of these negative effects are reinforced when online platforms have a global rather than a local scope. Therefore, governments struggle with the question if, when and how they need to intervene.

**Figure 1 Cumulative number of scientific papers**



Online platforms have many different manifestations. They come in all shapes and sizes. Some started at the time of the economic crisis around 2008 as an alternative for the consumer society. These online platforms belong to the sharing or collaborative economy, where sharing and exchanging of goods and services with fellow citizens is the idealistic starting point. Other online platforms started purely as a commercial enterprise or were developed from existing web activities. Some have become so important, that they have gained (international) economic and social importance and dominate their market. Therefore, there is a growing interest in this phenomenon from policy makers, media and academics. In scientific research there is an increased coverage of the subject, with a steep increase in the number of internationally peer-reviewed scientific publications since 2010. See Figure 1.

The debate around online platforms is mostly not supported with valid and reliable statistical data. Even the basic data are missing. For example, it is not clear how many

online platforms there are and what kind of characteristics they have; what the volume of the transactions is, that are generated through online platforms; and who the participants are that use or do not use these online platforms. That makes it difficult to assess the volume and impacts of online platforms in terms of market power, displacement effects, (global) competition, labour market effects, social behaviour and privacy. From a statistical point of view, the challenge is therefore to develop a set of relevant descriptive and measurable indicators for online platforms that fit a wide range of policy areas. To produce such a monitor, a precondition is that it must be clear what is understood by the term and elements of 'online platforms'. Otherwise, the measurement has no real value, especially when it accounts for the developments in the figures.

Currently, there is no consensus in the literature about a clear definition of the term 'online platform'. Many concepts are floating around as labels to describe more or less the same phenomenon, including: platform economy, sharing economy, collaborative economy, on-demand economy, gig economy, digital platforms and peer-to-peer networks. The sharing economy is also referred to as "a floating signifier" (Nadeem, 2015, p. 13) and one "without a consolidated economic approach" (Bruno & Faggini, 2017, p. 174). Following from this conceptual confusion, there is lack of a broad-based agreement on a clear typology of online platforms and the underlying discourses on social, economic and environmental impacts are contradictory (Martin, 2016; Frenken & Schor, 2017). Moreover, with technology developing much faster than economic and legal regulations (Maselli et al., 2016), this complicates any attempt to systematically measure (the impacts of) online platforms.

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Therefore, the purpose of this paper is threefold: (i) to clarify what is understood by online platforms and related terminology; (ii) to derive a typology of online platforms; and (iii) to propose a set of descriptive key indicators that can be used to measure the development of online platforms. On the one hand, these indicators should relate to those already used in the current (economic) statistics. Otherwise, a comparison cannot be made. On the other hand, indicators should be included that highlight the specific characteristics of online platforms.

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To be able to elaborate on this further, firstly, a literature review was carried out. This literature review covered 45+ publications, stemming from both scientific and policy-related institutional sources and going back to the year 2000. Databases consulted include: Google-scholar, CataloguePlus and the European Parliamentary Research Service. A search was conducted using the following key terms: "platform economy", "platform(s)", "sharing/shared economy", "collaborative economy", "collaborative networks", "on-demand economy", "peer-to-peer economy", "digital platforms", and the "gig economy". Secondly, relevant organisations have been consulted, among which: Sociaal-economische Raad (SER), Eurostat (the statistical office of the European Union) and VNO-NCW (employers' organisation). Besides this, interviews were conducted with key informants who are experts in this field: Martijn Arets, Maurits Kreijveld and Koen Frenken.

This paper is structured as follows. Section 2 describes the background of online platforms and discusses the principal definitions. The results of the literature study and statistical challenges are also described in this section. Section 3 reviews specific and broader categorisations of online platforms with the purpose to derive a typology. In Section 4, this is followed by a global overview of issues that are debated around online platforms. In Section 5, a first proposal is made for a set of descriptive statistical key indicators for further operationalisation and measurement. The paper concludes with some final discussion points and concluding remarks in Section 6. Finally, the appendix presents figures on specific components of online platforms that are available at Statistics Netherlands at this moment.

## 2. Defining online platforms

### 2.1 Background

Markets of all kinds are becoming increasingly digital. One of the drivers of that transformation is the phenomenon of online or digital platforms. These online platforms facilitate interaction and transactions between individuals and organisations by matching supply and demand of goods, services and/or information (incl. knowledge)<sup>1)</sup>. The distinguishing feature of today is that the matching of supply and demand takes place through the internet, as a set of digital and sometimes interconnected platforms (e.g. Kreijveld, 2014 and Van Dijck, 2016).

Unlike the material economy, the existence of a digital infrastructure, among others, increases the ease and speed of interactions, changes the scope from local to global, enlarges the choice possibilities of the participants, and lowers the transaction cost for providers and users of online platforms (efficiency). This comes with low-entry barriers in new markets, easy access to innovative ideas and new business models, as well as direct and indirect network effects<sup>2)</sup> (drawing more participants to the platform) and economies of scale and scope (OECD, 2018 and Kreijveld, 2014). Besides these innovative benefits for consumers, businesses, science and governments, clear risks can also be distinguished in the rapid development of online platforms. Examples of these risks are the evasion or fuzziness of applicable legal regulations, often moderate or poor working conditions, for example, in the so-called gig economy (small jobs) and new taxation matters as well as privacy and consumer protection issues and the sometimes disruptive character of online platforms as new entrances into certain sectors (e.g. accommodation, publishing and transportation services). These issues raise new political and regulatory challenges, like whether, when and how government should intervene.

<sup>1)</sup> These platforms can also be called digital matching firms or online intermediaries.

<sup>2)</sup> Direct effects relate to the effect that more users attract more users to an online platform. Indirect effects relate to the effect that more users attract more providers to a platform.

**Table 1 Possible relations between providers and users of online platforms**

Provider\User	Consumer	Business	Government	Science
Consumer	C2C	C2B	C2G	C2S
Business	B2C	B2B	B2G	B2S
Government	G2C	G2B	G2G	G2S
Science	S2C	S2B	S2G	S2S

The key characteristic of the matching of supply and demand through online platforms is that it concerns multi-sided relations. On the supply side, online platforms affect the traditional organisation of production, including how work is organised. On the demand side, online platforms have led to new ways of consumption, such as sharing. Trust between user and provider is a key component of the functioning of online platforms, often supported by review and rating systems.

Multi-sided matching of supply and demand through online platforms can involve different entities, like B2B, B2C, S2B, C2G or C2C (peer-to-peer). See Table 1. This does not only involve consumers and businesses, but can, for example, also involve governments and science who can act, sometimes at the same time, as sellers or providers and buyers or users.

In addition to the actors and entities in the matching process of online platforms, also the types of 'products', that are 'exchanged' in the transaction process, play a role. This may involve digital information<sup>3)</sup> (e.g. Google, Twitter and Facebook), (second-hand) products (e.g. Amazon and eBay) or services (e.g. Booking, Uber and TaskRabbit). Products and services can be delivered physically or digitally. The transactions can be for profit or non-profit. The reach of online platforms varies from local (for example handyman services, sharing of tools and the sharing or selling of most physical products) to global, especially if it concerns products or services that can be provided digitally, such as data entry, design, books and music. Without specific limitations, this system of sometimes interrelated online platforms can be called the '*platform economy*'.

A part of the platform economy, which attracted particularly much attention, is the so-called '*sharing or collaborative economy*'.<sup>4)</sup> The sharing economy narrows the platform economy down to mostly consumer-to-consumer, or in other words peer-to-peer, relations and transactions. The sharing economy has stimulated the trading, lending and sharing of products, services and information on a larger scale between peers, so-called 'pro-sumers'. In this way of production and consumption, peers can be both provider and user, whereby they can adopt both roles, sometimes at the same time. The scope of the term 'sharing economy' is not very clear. Most definitions do not only narrow the platform economy down to peer-to-peer transactions, but also limit the scope down to transactions where there is only temporary access to the products or services which are 'exchanged' between provider and user of online platforms. There is no transfer of ownership. Therefore, natural persons possess underused or idle assets, such as homes, cars, tools, money and skills. With these assets they provide services to other persons such as accommodation (e.g. Airbnb), transportation (e.g. Uber), administrative support (Clickworker), small jobs, crowd

<sup>3)</sup> This could be, for example, text, video or music, but also knowledge.

<sup>4)</sup> Sometimes also called the 'on-demand economy'.

funding (Kickstarter) and design or consultancy work (Upwork). Some, (e.g. Frenken, 2017 and Eurostat, 2018) only consider the sharing and lending<sup>5)</sup> of assets, such as homes, cars etc., as part of the sharing economy. The supply of labour for small jobs (the so-called 'gig economy'<sup>6)</sup>) and crowd funding are not seen as part of the sharing economy, but as separate categories of the peer-to-peer economy. The growth of the sharing economy has taken place in the last ten years. In fact, the phenomenon has mainly arose after the economic crisis in 2008-2009. At first, the emphasis of most sharing platforms was on sharing, social aspects and sustainability, especially in economically less good times. However, if platforms want to develop themselves further, they need funding, meaning that they are often forced to work in a more commercial way (SER, 2015). Therefore, sharing platforms can vary from small non-profit platforms with an idealistic point of view to large totally commercialised online platforms. It also becomes more and more difficult to see the distinction between ideals and commerce. Depending on, among others, their goal, the technical architecture and the economic strategies (e.g. business models), the differences between online platforms can be large. Opposite to this narrow definition, sometimes a much broader scope is used. This view also includes peer-to-peer selling of second-hand goods, social media and search engines.<sup>7)</sup> If these elements of online platforms are included, it is, contrary to the term 'sharing economy', better to talk about '*the peer-to-peer platform economy*'.

The fact that people and organizations are willing to share with or lend products or provide services to mostly strangers, for profit or non-profit, is for a large part based on trust and reputation of the online platform. Trust and reputation building are often based on review and rating systems (Botsman, 2017). In addition, the size (number of providers and users) of the online platform also plays a role here.

A somewhat different way of looking at online platforms is to place these platforms in the context of innovation and more flexibility in foremost business-to-business collaborations (Kreijveld, 2015). The notion is that enterprises increasingly use online platforms in all kinds of ways to coordinate their business efforts, that is to share and exchange knowledge and resources with others and thereby innovate faster (so-called open innovation). This concerns mostly enterprises, but it can also involve the collaboration between enterprises and customers, governments and science. Instead of traditional single and uniform value chains, all kinds of collaborations with different and changing groups of partners are created with the aid of online platforms. In this context, online platforms can be seen as continuously changing (digital) organisational structures that use a shared base of (organisational) building blocks: technologies, infrastructures, agreements, competencies and standards. On the basis of these mostly closed ecosystems, changing groups of partners can innovate together and develop additional (technological) products or services. An online platform can be set up by a single player who opens up his product, service, infrastructure or process and makes it available to third parties, even competitors. However, it can also be set up by multiple players joining their competences, knowledge and resources to strengthen and innovate the work together. Online platforms are then the new organisational structures for collaboration. These new ecosystems of partners can break existing power blocks and can occur anywhere in the traditional value chain. In

<sup>5)</sup> Includes swapping.

<sup>6)</sup> Besides P2P transactions the gig economy also contains B2P transactions for small jobs. This last group is not part of the sharing economy.

<sup>7)</sup> Also, for a large part used by businesses and governments.

these dynamic business environments, enterprises can also more easily enter each other's markets, vertically or horizontally, often approaching markets in a new way.

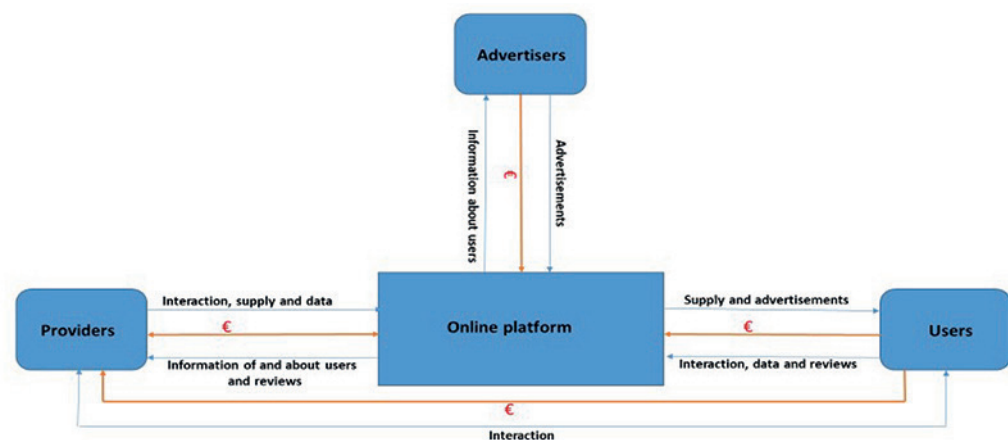
These so-called innovation-driven online platforms fall inside the scope of the platform economy, but outside the scope of peer-to-peer or the sharing economy. That also accounts largely for the comparable development platforms that are made available by, for example, Google, Apple and Microsoft. Platforms where anybody, businesses or individuals, can develop apps and services that can be made available to users through online development platforms. In this way, innovation is reinforced because these online platforms attract third-party innovators.

A final group of online platforms that require attention are the price comparison sites and content aggregator websites. Examples are Skyscanner.com (transportation), Tweakers.net (ICT), Google-Shopping and Kieskeurig.nl (consumer products). These online platforms collect information, often prices, from other websites and present this information in an accessible way for consumers in one easy-to-find location. Sometimes they add their own content, like descriptions and reviews. These online platforms often function as a first gateway of consumers to other websites, including online platforms, where goods and services are sold. Their position as a main gateway for consumers provides them with some market power. The revenue streams are based on, for example, a small commission from the providers for the number of products sold, the number of clicks and advertisements. These online platforms are classified under the general term of online platform economy and not under the peer-to-peer economy or the sharing economy.

## 2.2 Elements of online platforms: ecosystems, interactions and transactions

In general, an online platform is a digital intermediary, which matches supply and demand in a multi-sided market through the internet. Online platforms do not only match providers and users, but they mostly also facilitate possible transactions resulting from interactions. Online platforms differ in their role and the 'products' they exchange.

**Figure 2 Actors and relations in the model of an online platform**

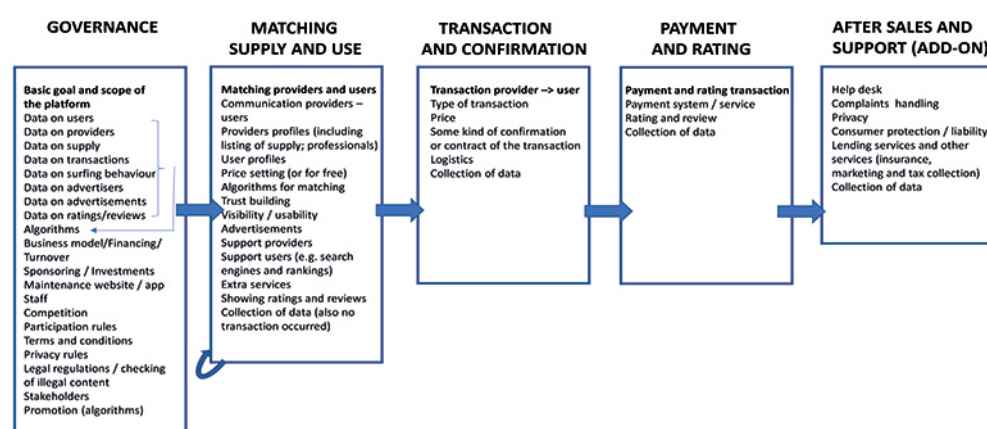




At least three groups of actors are always active within the ecosystem of online platforms, i.e. providers (supply side), users (demand side) and the digital platform (intermediary) itself. See Figure 2. The providers offer products, services, skills and/or information (e.g. knowledge) to (potential) users. In the case of the sharing economy, the providers are mostly limited to natural persons or peers. Providers usually receive information from the online platform of their users, such as background data, surfing behaviour and reviews and ratings. On the other hand, there are the users of the online platforms. They search the platforms for goods, services and/or information (e.g. knowledge). The online platform matches them with providers and – if needed – facilitates their transaction(s).<sup>8)</sup> The matching is often done on the basis of algorithms or at least sets the governance rules under which the matching takes place. Online platforms are usually not very open about how these algorithms work. Algorithms are not only used for the matching or ranking of the search results<sup>9)</sup>, but also, for example, for setting prices (in real time) and the matching of users with advertisements.

If the use of the online platform is not for free, providers and/or users have to pay a commission to the platform for a transaction and/or for the access to the platform. Finally, if a transaction between a provider and a user comes about, the user pays the provider if the transaction is not for free. Often, there is some kind of a digital confirmation of the transaction and support of a payment system of the online platform. Turnover for the online platform can also be generated through add-ons, insurances, logistic activities, cancelation fees etc. If the online platform is for free, they often function on the basis of sponsorships or investments. The consumption of the transaction can take place immediately or only later. For other process elements of online platforms, see Figure 3.

**Figure 3 Process elements of online platforms**



For the development of online platforms, it is crucial to attract as many providers as possible. The greater the visibility of the online platform, the more attractive the online platform will become for other potential providers and users. More providers attract more users to the online platform. In turn, more users attract more providers, etc. This game of attracting more participants to the platform is an important driver for the growth of an online platform, also in relation to its competitors. These potential growth drivers are called direct and indirect network effects of online platforms (OECD, 2018). Network effects do not necessarily have to focus only on the number of users. Depending on the function of the platform, it can also be based on, for example, the amount of content (Youtube) or the

<sup>8)</sup> A match or interaction does not necessarily lead to a transaction.

<sup>9)</sup> For example, it is important which results are shown first and which results lower in the list.

number products and services on offer (Marktplaats). Eventually, this process can result in the “winner takes all” and losers who did not play this game as well.

Trust in and reputation of the online platform and its providers by the users are also critical elements. Online platforms are more a ‘trust business’ than a ‘technology business’. Trust is crucial for the users to leap in the uncertain (Botsman, 2017). Another aspect in the competitive game of online platforms is that online platforms, as new entrants in a sector, usually target a specific part of the value chain. They mostly do not produce, own or manage the products and services on offer in the sector. In the first instance, they only act as digital intermediaries. This means that the costs for entering a sector are relatively low. In some cases, this can lead to disruption and rapid changes in sectors<sup>10)</sup>.

With many online platforms, users are exposed to advertisements. These are provided by advertisers. They pay the online platform to match their advertisements with the right target groups, mostly on the basis of algorithms. In order to do so, online platforms use the collected information on background (so-called profiles) and surfing behaviour of their users. These advertisements are often a major source of income for online platforms: the more users, the more attractive that online platform becomes for advertisers. This can earn them a great deal of money now that advertising budgets are increasingly shifting from traditional media to online channels.

Before discussing the principal definition of online platforms, the next paragraph elaborates more in-depth on the different definitions and aspects that are used in the literature by various scholars.

## 2.3 Literature review

This section explores the different terms being used in the literature to describe the online platform phenomenon, starting with the terms ‘sharing economy and collaborative economy’. A more general term that is mostly used is the ‘platform economy’. Despite the different drives for using them, there seem to be important elements that all these terms encompass: (i) through an online platform a multi-sided exchange is facilitated between providers and users, (ii) it concerns goods and services, including labour and financing as well as exchange information and knowledge, (iii) the supply of goods, services and information is done either by organisations, by peers or both and (iv) this can be done for profit or not-for-profit.

The ‘sharing economy’ is the first term ever used to describe the platform phenomenon, originating from the Focolare Movement of Christian communities in Italy<sup>11)</sup>. At the time, academics studying the movement referred to it as an “experienced-centred access economy or profit sharing” (Oh & Moon, 2016, p. 2). Lessig (2008) then developed the concept to another context, that is copyright law in relation to the free sharing of cultural goods, such as music, video and films. Since then, academics started explaining the concept as a context-dependent phenomenon. Benkler (2002) analysed that the individuals participating in the sharing economy have non-monetary incentives – social reputation,

<sup>10)</sup> Often this leads to the discussion if an online platform is an ICT firm or a business in the sector concerned. This often relates to the legal regulations applied in that sector.

<sup>11)</sup> The Economy of Communion began in 1991 in Brazil when the socio-economic conditions of the country were deteriorating. The proposal was for businesses to share their profits based on fraternity. The objective is to create jobs for all those who are in need, include those who are excluded and help in emergencies. For more information: <http://www.focolare.org/en/dialogue/cultura/economia/>

cooperation and self-satisfaction (Oh & Moon, 2016). In line with that, the same emphasis has been put forth by Koopman et al (2015)<sup>12)</sup> and Frenken (2017)<sup>13)</sup>, both referring to the multiple-ownership but adding that it is the sharing of 'underutilised assets', where they highlight its impacts beyond monetary benefits. In the present literature on the 'sharing economy', there also seems to be a discussion on its negative consequences, for example, emphasising its social equity impacts, e.g. Frenken & Schor (2017) and Schor (2017).

The EU commission uses the term by emphasising the collaborative aspect and the use of multiple players. It is evident that they use both the sharing and collaborative economy interchangeably<sup>14)</sup>. The expression 'sharing economy' is commonly used to indicate a wide range of digital commercial or non-profit platforms facilitating exchanges amongst a variety of players through a variety of interaction modalities (P2P, P2B, B2P, B2B, G2G)<sup>15)</sup> that all broadly enable consumption or productive activities leveraging capital assets (money, real estate property, equipment, cars, etc.) goods, skills, or just time" (EU, 2016, p. 22).

The concept of the 'collaborative economy' seems to be preferred by some scholars, because of its use in less commercially oriented contexts than the term 'sharing economy', even though they both seek a decentralised economy (Martin, 2016, p. 158). Botsmann (2010) also explains the sharing economy as a form of 'collaborative consumption'. She defines the 'collaborative economy' as "initiatives based on horizontal networks and the participation of a community"; it is built on "distributed power and trust within communities as opposed to centralised institutions" (Botsman, 2010: quoted in Nerinckx, 2016, p. 246). Nevertheless, Nerinckx (2016) adds that it is characterised by blurring the lines between producer and consumer (Nerinckx, 2016, p. 246). Thus, the weight given to the collaborative aspect of the phenomenon runs the risk of side-lining the 'underlying service' or 'production' that is being provided. Consequently, this makes it difficult, for example, to distinguish between the employer and employee (Nerinckx, 2016, p. 258).

Drahojoupil & Fabo (2016) argue that terms such as 'collaborative' and 'sharing' are misleading terms, because collaboration does not necessarily entail a relation to the marketplace where goods and services are facilitated. Moreover, the term 'sharing' is commonly used to refer to outsourcing platforms, however 'renting' seems more appropriate in this context. Accordingly, the use of the term 'platform economy' is more holistic in its definition of the phenomenon, which "decreases the transaction costs of labour outsourcing and temporary access to goods and services" (Drahojoupil & Fabo 2016, p. 2).

For the purpose of this literature review, to provide a neutral and practical definition, the third most commonly used term, 'platform economy', perhaps seems to be the most appropriate. The platform economy has also been defined in a mere simple way such as a technological tool for the collection of assets (Robertson & Ulrich, 1998).<sup>16)</sup> Similarly, the economic theoretical perspective claims that platforms basically act as "conduits between

<sup>12)</sup> Koopman et al (2015, p. 532) "any marketplace that brings together distributed networks of individuals to share or exchange otherwise underutilised assets".

<sup>13)</sup> Frenken (2017, p. 2) "sharing economy as the practice that consumers grant each other temporary access to their under-utilised physical assets".

<sup>14)</sup> See link: [http://ec.europa.eu/growth/single-market/services/collaborative-economy\\_en](http://ec.europa.eu/growth/single-market/services/collaborative-economy_en)

<sup>15)</sup> P2P= Peer-to-Peer; P2B = Peer-to-Buyer; B2P= Buyer-to-Peer; B2B= Buyer-to-Buyer; G2G= Government-to-Government.

<sup>16)</sup> Robertson and Ulrich (1998, p.1) "platforms as the collection of assets (i.e., components, processes, knowledge, people, and relationships) that are shared by a set of products."

two (or more) categories of consumers who would not have been able to connect or transact without the platform" (Gawer 2014, p. 1241). This technical focus is received with some scepticism (Kenney & Zysman 2015; Gawer 2014)<sup>17)</sup>. Gawer (2014) argues that two main limitations arise from the simplification; platforms are assumed to be exogenous and fixed, and that both sides of the platforms are considered simple providers and consumers. This means that there is no distinction between end users and innovative developers, and also in turn the evolution, the how and why, of the platforms is left out of sight (Gawer 2014, p. 1241). Eisenmann et al. (2009), challenge the static 'demand-side' assumptions, and highlight that by addressing platform competition, and its innovative aspect, the 'demand-side users' and 'supply-side users' are manifested. However, Gawer (2014) argues that in today's digital economy, even though a supply and demand can be recognised, the users can play both roles in non-separable ways. For example, in digital platforms such as Facebook and Google, the endusers who use the service are at the same time feeding their personal data into the system, upon which the platform delivers its services accordingly (Gawer, 2014). Innovation is no longer restricted to its producers, but users willingly contribute to a collaborative innovation. Thus, Gawer (2009) defines platforms as "...a building block, providing an essential function to a technological system – which acts as a foundation upon which other firms, loosely organised in an innovation ecosystem, can develop complementary products, technologies or services" (Gawer, 2009, p. 54). In the same line, Kreijveld (2014) sees platforms as a technical foundation on which others can develop additional products, services and technologies. This also includes platforms for the development of apps, like iOS and Google Play Store. This enables changing groups of participants, such as businesses, governments, science and individuals, to coordinate their efforts and share their knowledge ('open innovation') and thereby innovate much faster.

Finally, it must be clear that social networking platforms (e.g. social media and search engines) are also grouped under the term 'online platforms'. Strictly speaking, they clearly meet the characteristics of an online platform, especially when it comes to peer-to-peer exchange of (digital) information. Examples are: instruction videos, manuals, public source code and designs, which can be found on these online platforms to help users to get started in different areas. However, they are mostly not included under the term 'sharing economy'.

## 2.4 Principal elements and definitions

A number of characteristics of online platforms emerge from the literature and conducted interviews.

In the first place, online platforms are part of the digital economy.

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**The *digital economy* is "comprised of markets based on digital technologies that facilitate the trade of goods and services through e-commerce" (OECD, 2013, p. 5) or broader, is "an economy based on digital computing technologies" (Wikipedia<sup>18)</sup>).<sup>19)</sup>**

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<sup>17)</sup> Kenney & Zysman (2015, p.2) "one in which tools and frameworks based upon the power of the internet will frame and channel our economic and social lives".

<sup>18)</sup> See [https://en.wikipedia.org/wiki/Digital\\_economy](https://en.wikipedia.org/wiki/Digital_economy).

<sup>19)</sup> Since nowadays technology is almost interwoven with every activity in society, it has become very difficult to distinguish the digital economy from other parts of the economy.

As part of the digital economy, online platforms or the platform economy “are digital services or markets that facilitate interactions between two or more distinct but interdependent groups of users who interact through the service via internet” (see OECD, 2018, p. 13). Or better and more specifically:

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**An *online platform* is a digital service based on a technological, socio-cultural and economic infrastructure for the facilitation and organisation of online social (interactions) and economic (transactions) traffic between two or more distinct but interdependent groups of providers and users, with data as fuel” (Van Dijck et al, 2016, p. 11, OECD 2018, p. 13). Providers and users can be both individuals and businesses as well as science organizations and government.**

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In this last definition, the technological, social and economic layers of online platforms are better recognised than in the first definition of the OECD. Providers and users represent respectively the supply side and the demand side of products, services and (digital) information (including knowledge), but also other participants can be involved, such as advertisers and publishers in the case of added content. The above definition of online platforms includes also B2B, C2B, G2B and S2B innovation and development platforms as well as social media, search engines and price comparison sites.

If the platform economy is limited to mostly peer-to-peer interactions and transactions, this is called the *peer-to-peer economy*<sup>20)</sup>. This also includes the selling of second-hand products, social media and search engines. The *sharing or collaborative economy* then is part of the peer-to-peer economy, but focuses more or less on underused or idle assets, with no change of ownership.

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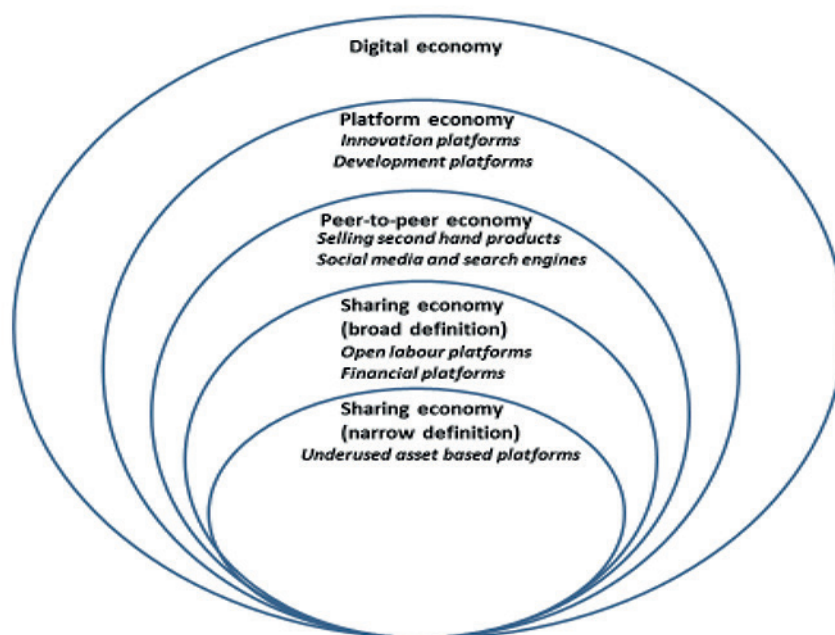
**The *sharing economy* is then defined as “an open socio-economic system of the sharing for profit or non-profit of under-used or idle assets and services by completing peer-to-peer transactions, enabled by online platforms that are organised as intermediaries or communities, allowing parties to benefit from usage outside the primary use of the asset or service” (see for example, ONS, 2017, p. 3).**

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If the sharing economy also includes the supply of work for small jobs and crowd funding, then there is a *broad definition* of the term. If it only includes the supply of underused assets, then there is a *narrow definition* of the term. Eurostat (Eurostat, 2018) is currently inclined towards the broad definition of the sharing economy. This is important to know if one strives for international comparable figures. See further Figure 4.

<sup>20)</sup> Sometimes also called peer-to-peer networks or mesh economy.

**Figure 4 Different types of online platforms**



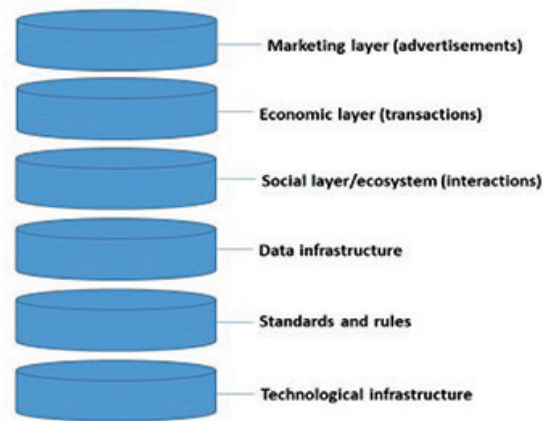
Following the above definition, the main characteristics of an online platform are:

- Based on an infrastructure enabled by *internet technologies* (websites or apps; the *technology layer* – see Figure 5). Non-digital platforms are excluded here, such as notice boards in supermarkets or newspapers.<sup>21)</sup> In addition to the basic technology infrastructure, online platforms have standards and rules that apply to all the participants of the online platform;
- A multi-sided and mostly open market or community, that involves *an ecosystem of at least three distinct but interdependent groups of actors*: (i) providers who trade goods and services or share and lend assets, resources, time, skills or (digital) information, (ii) users of these and (iii) the online platforms as intermediaries that match providers with users and facilitate transactions (EU, 2018). Actors can be both provider/producer and user/consumer. Often, a fourth actor is involved, namely those who supply the advertisements on the platform;
- Facilitates *multi-sided matching and interactions of providers and users*, actively as well as passively. In fact, efficient matching is a key element of the success of online platforms. Together with the ecosystems of participants (see the previous element), this distributed network of people is the *social infrastructure or layer* of online platforms. The matching process can be transparent (e.g. started by the user) as well as non-transparent (e.g. on the basis of algorithms). For the sharing economy, interactions are limited to those of P2P, P2B and P2G. In practice, however, more and more hybrid systems arise, where consumer-to-consumer and business-to-consumer relations (B2P) are intertwined;<sup>22)</sup>

<sup>21)</sup> Boundaries are sometimes vague. A question, for example, is: what about digital newspapers?

<sup>22)</sup> One option is to see which part of the platform is P2P and which part B2P and then decide whether or not the platform should be covered or use a >50% ratio of P2P transactions as a deciding criterion.

**Figure 5 Different layers of an online platform**



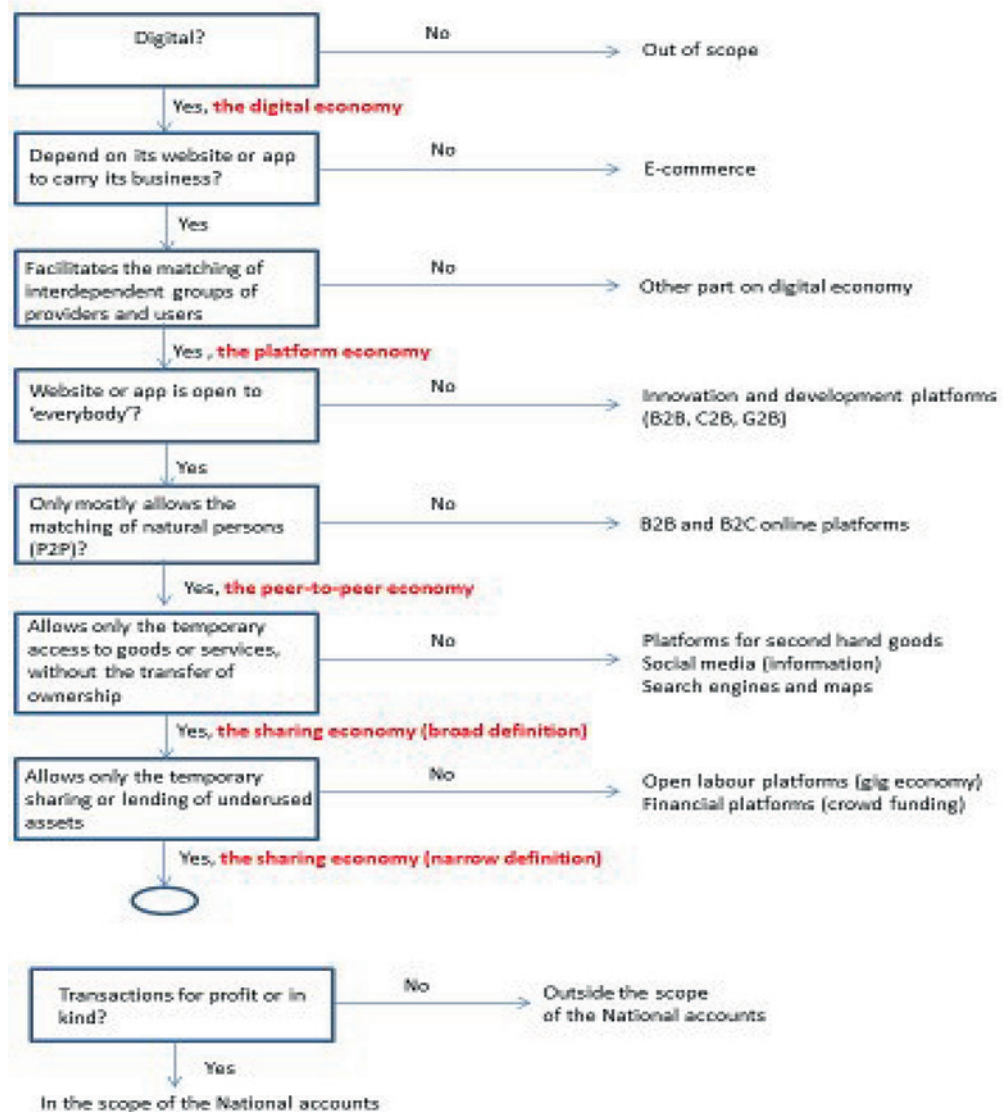
- Enables transactions that can benefit the provider and the user, as well as the online platform. This is the *economic layer* of online platforms, also including non-profit or in-kind transactions. For the sharing economy, this involves sharing<sup>23)</sup>, renting and swapping or trading of goods, services (including money), skills/labour and (digital) information. In the narrow definition of the sharing economy, the transactions are limited to the *temporary* sharing or lending of underutilized or idle goods and services, that do not involve a change of ownership of the assets<sup>24)</sup>. The offered asset was not purchased by the provider with the purpose to be traded commercially at a later stage. And the user does not necessarily buy and own the product, but only wants temporary access to it. In other words, the sharing economy reflects an economic model in which individuals are able to use assets owned by someone else;

<sup>23)</sup> Although the term 'sharing' is reminiscent of unpaid transactions, paid transactions are of course also included.

<sup>24)</sup> This makes the difference with the circular economy.



Figure 6 Decision tree



Source: partly based on the decision tree of the Office of National Statistics (ONS, 2017).

- New business models. Besides non-profit models, this can range from turnover on the basis of transaction or access commissions for the provider or user or for both to turnover on the basis of advertisements or a combination. Sometimes the turnover is generated by investors or the inclusion of extra services, such as insurance, logistic services or cancelation fees. In order to attract more users, it is sometimes taken for granted that no profit is made at the moment. (Part of) the use of the online platform by providers and users can be for free. This kind of free use is an incentive to reinforce the participation and value creation of the online platform;
- Governed and driven by user and provider-generated information. This information is, among others, used by the platform for the matching of providers and users (for example by ranking the providers or search results), price settings and the targeting of the advertisements to the users. In that respect, collected data is worth a great amount of money. Besides that, information on providers and users is crucial for the growth strategies of online platforms.



- The matching and transaction processes are often based on a user-driven trust mechanism, including reviews and rating systems. Usually, the providers are reviewed and assessed, but sometimes users are as well (e.g. Uber);

Other characteristics of online platforms, that play a less differentiating role, are:

- The fact that the transactions can be *for profit or not-for-profit*. This also relates to the debate about the boundaries of the National Accounts (NA) with market and non-market transactions;
- A new channel for *promotion and marketing (advertisers)* of (other) goods and services. This is the *marketing layer* of online platforms. Advertisements are often the most important income source of online platforms.

The above-mentioned characteristics lead to the decision tree in Figure 6.

## 2.5 Statistical challenges

In practice, the above description and demarcation of online and sharing platforms come with a number of *statistical challenges*, that is:

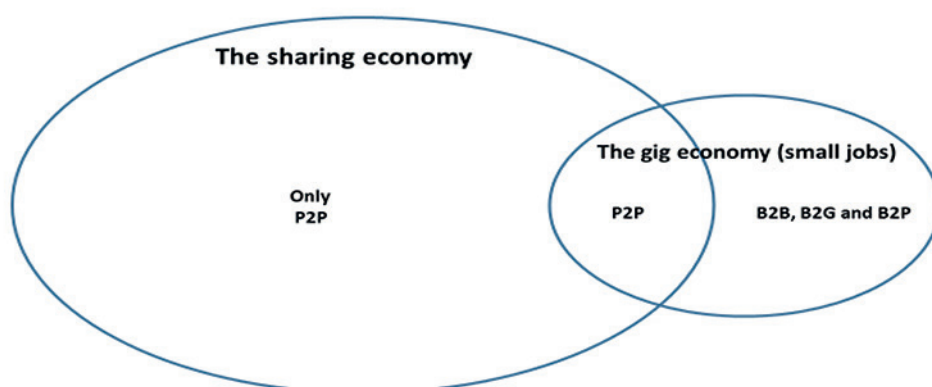
- There does not exist a complete overview and thus population of online platforms in the Netherlands (internet);
- If there is an economic activity of some size, these enterprises or natural persons must be included in the Business Register of Statistics Netherlands (ABR). The ABR is divided into various economic activities following the so-called NACE-coding<sup>25)</sup>. However, there is no specific economic activity code for online platforms. If online platforms are included in the business register, they will often not be included in the economic activity (industry) in which they are active, but in other industries. They will often be included in, for example, ICT or trade;
- In addition, enterprises are only included in the Business Register if they have their headquarters or (pseudo) branch in the Netherlands. With online platforms, this is not always the case. For example, Airbnb has no headquarters or branch in the Netherlands. This makes it rather difficult to come up with a complete list of online platforms. In practice, it also has proven to be difficult to obtain information from foreign-based online platforms in particular. They cannot be forced by law to provide information;
- To get a good statistical picture of online platforms, one should be aware that at least data have to be collected from the providers, the users and the platforms themselves: the whole online ecosystem. That means that three different groups of respondents have to be approached with some kind of (digital) questionnaire;
- Online platforms make it much easier for enterprises and individuals to expand from local to global markets and offer their products and services internationally. Consumers also no longer have to limit their choice to local offers. They can enlarge their search area for products and services to global level. This means that international trade will increase. This increase of international trade through online platforms is difficult to visualise through traditional statistics and thus the National Accounts. As said, many online platforms and providers are not located in the country concerned, therefore their economic transactions are not directly part of national statistics;
- There is a growing tendency for horizontal and vertical integration of activities of online platforms. Online platforms are not only active in one sector, but also expand to other sectors with the same strategy. For example, Amazon has grown into an online platform

<sup>25)</sup> The NACE is the standard system for classifying economic activities within the European Union for statistical purposes.

where not only (second-hand) music and books are sold, but all kinds of products. But it can also go further, where online platforms add other services and functions to support their matching and transaction processes, such as payment options, logistics, money lending services and the like. Online platforms are also increasingly seen as big advertising companies. This concerns vertical integration. These types of combined activities of online platforms usually do not fit well with the current classifications of statistics (e.g. NACE);

- A distinction can be made between market and non-market transactions, where market transactions involve payment in money or in kind. This relates to the way the National Accounts work. The National Accounts only include market transactions. For example, the National Accounts do not include the trading of second-hand goods, even though this has a replacement value for the economy. Although this criterion is not used here for the further delineation of online platforms and the sharing economy, it is an issue that should be considered when collecting data. One should also be aware that the activities of online platforms are already partly captured in the National Accounts;
- Practice has shown that it is difficult for respondents to distinguish between all types and definitions of online platforms and websites and apps, which are not an online platform. It is difficult to describe online platforms in an understandable way in questionnaires, also because respondents do not read explanatory notes very carefully. This can lead to wrong answers. That also accounts for the distinction between domestic and foreign transactions.
- Online platforms can differ greatly from each other. This means that online platforms do not lend themselves for one standard questionnaire. If all possible situations are taken into account, chances are that the questionnaire will be come to big and complex for respondents;
- The distinction between peer-to-peer and business-to-peer transactions through online platforms is becoming increasingly blurred. For example, Booking, as an initially B2C platform, also started to offer peer-to-peer accommodation services, in addition to hotel rooms. At the same time, Airbnb as an initially peer-to-peer platform also includes commercial renting of bed and breakfasts, apartments and holiday homes. This makes it increasingly difficult to make a distinction between online platforms in general and sharing platforms. Although it is a matter of choice, whether or not these hybrid online platforms are (partly) included or excluded in the statistical demarcation of the sharing economy;

**Figure 7 Delineation of the sharing economy with the gig economy**



- The difference between a natural person (peer) offering a service and a (micro) enterprise offering the same service is also not always very clear. This applies, for example, to service and labour-orientated transactions in particular. See the example of the gig economy in Figure 7. It is not easy to make the distinction between a natural person seeking a temporary job through a temporary employment agency or through an online platform. Part of the answer could be found by looking at the openness of the online platform or website. Platforms of temporary employment agencies are closed online platforms (or better websites). The employment agency not only governs the platform, but also decides who does and who does not have access to the platform (B2B). These platforms are therefore not part of the online platforms in general or peer-to-peer or sharing economy. Although peer-to-peer and sharing platforms also have rules of access, the platforms are initially accessible and thus open to everybody. Furthermore, in the sharing economy the demand of labour focuses more and more on separate tasks (e.g. parts of a job) and not on the job as such (temporary employment agencies). A more distinctive characteristic is perhaps the fact whether or not a person has an employment contract with the online platform or is seen as a self-employed person;

### 3. A typology of online platforms

As much as there exist different labels and definitions for online platforms, categorisations based on mutually exclusive criteria also vary widely. Categorisations can be either specific or broader, and are based on different criteria, including interaction modality, product or asset mix, profit orientation and underlying motives or strategies for participation.

For example, Martin (2016, p. 153) distinguishes between four categories of online platforms: (1) accommodation sharing (2) car and ride sharing (3) peer-to-peer employment platforms, and (4) peer-to-peer platforms for sharing and circulating resources. Martin's categorisation especially emphasises the different products and services that are exchanged between providers and users. His focus is especially on the sharing economy.

Another categorisation is proposed by the Center for Global Enterprise, in a paper written by Evans & Gawer (2016). They separate online platforms into four categories: (1) transaction platforms (2) innovation platforms (3) integrated platforms, and (4) investment platforms. They find that almost all the private companies are transaction platforms (social media platforms, market places, media, music, money, fintech, and gaming). These transaction platforms facilitate "transactions between different users, buyers, or suppliers".<sup>26)</sup> Innovation platforms supply the technological infrastructure as the basis for third-party developers (see also paragraph 2.1.). The integrated platform category combines characteristics of transaction and innovation platforms. Moreover, they are more distinctive than the other

<sup>26)</sup> The rise of the platform enterprise by P.C. Evans and A. Gawer, 2016 (page 9).

platforms because these companies, such as Apple, Google, Alibaba and Facebook, have manufacturing supply chains. They include both matching as well as developers that create content. The investment platform category encompasses companies that are not platforms per se, but instead they invest in platform companies or act as a holding company. These companies have clear investment strategies where they provide “the back-end infrastructure and the front-end user experience”. The most recent investment company that has emerged is Rocket Internet, which sets out to build a portfolio for companies in ‘undeserved’ markets through regional domestic investment groups (Evans & Gawer, 2016, p. 15). This categorization of Evans & Gawer is often referred to in the literature.

More detailed categorisations are also mentioned in the literature. Platform Hunt<sup>27)</sup>, for example, distinguishes nine types of what they call software platforms. In the domain of innovation platforms they distinguish:

1. Technology platforms like Amazon Webservices. Technology platforms provide building blocks or services that are reused and embedded in all kinds of products. Technology platforms do not fit the definition of online platforms, they are not multi-sided markets.
2. Computing platforms, like Apple iOS and Google Android. Computing Platforms connect users and developers through app stores. This fits with what was previously called innovation platforms.

When it comes to search engines Platform Hunt calls these:

3. Utility platforms, like Google search. Utility platforms attract users by providing a useful, often free service.

Most social media are categorised under the title of:

4. Interaction platforms, like Facebook. These platforms facilitate social interactions between the participants of the platform through, for example, messages, photo's videos or voice. Users join the platform to interact with other users.
5. This relates to Content crowdsourcing platforms, like Youtube. In contrast to Interaction platforms, this is all about the content, which is collected from users sharing this content with other users.

If it not only concerns interactions but also transactions there are:

6. Platforms as marketplaces, like eBay, but also Airbnb and Kickstarter. These are typically two-sided markets which connect supply and demand and where the focus is more on the transactions than on the interactions. In contrast to interaction platforms, users look more at the products and not the users or suppliers.
7. On demand service platforms, like Uber and Thuisbezorgd. The function of these platforms is to deliver a fixed service to the user. In contrast to platforms as market places, with on-demand service platforms the user has little influence on who will deliver the service and on the prices. This is determined by the platform. The user experience is essential.

Other types of online platforms are:

8. Data harvesting service, like Waze. These platforms provide a service to the users, based on the information generated by users themselves. Otherwise you cannot join the platform. The generated data is essential for the platform.
9. Content distribution platforms, like Google AdSense. Such platforms connect owners of websites and apps with content providers.

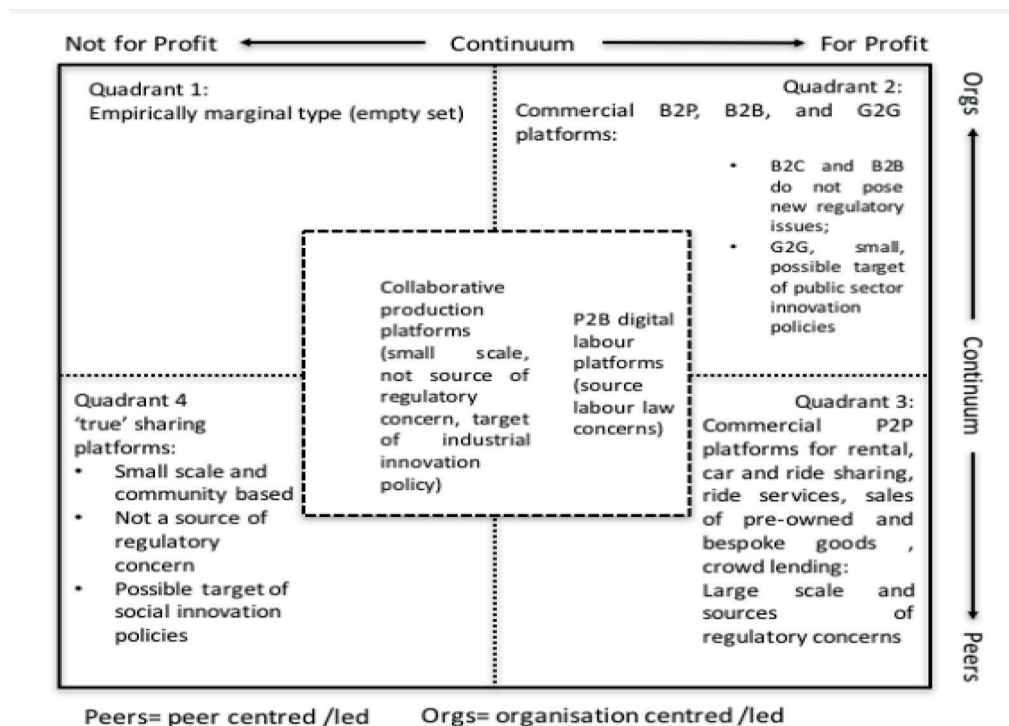
In the domain of the sharing economy, Schor et al. (2014) distinguishes between five categories: (1) recirculation of goods (2) increased utilisation of tangible assets (3)

<sup>27)</sup> <https://medium.com/platform-hunt/the-8-types-of-software-platforms-473c74f4536a>

exchange of services (4) sharing of productive assets, and (5) building of social connections. This categorisation is quite specific and based on interaction modality and asset mix. An even higher number of platform categories is distinguished by Kenney & Zysman (2015, p. 65-66). They distinguish between the following seven categories of online platforms in terms of function: (1) platforms for platforms (2) platforms mediating work (3) platforms making tools become available online (4) electronic goods markets for retails and business run an entire gamut (5) platforms intending to transform service industries (6) shifting the place of intermediaries in finance, and (7) facilitating social and political organisation, including worker organisations. One can easily imagine the number of categories to increase in the coming years, if such a specific criterion as functionality is used.

Aside from these more specific categorisations of platforms, there are also broader categorisations used in the literature. For example, Gawer & Cusumano (2013, p. 417) distinguish between two categories of platforms: (1) internal platforms, which are defined as "a set of assets organised in a common structure from which a company can efficiently develop and produce a stream of derivative products", and (2) external platforms, defined as "products, services, or technologies that are similar in some ways to the former but provide the foundation upon which outside firms can develop their own complementary products, technologies or services". This is similar to what was mentioned earlier as innovation and development platforms. Furthermore, Puschmann & Alt (2016) demarcate three core layers, including: (1) strategies (2) processes and (3) systems in a single hybrid framework of the sharing economy. A broader categorisation brings the advantage of not immediately ruling out newly emerging platforms. However, since multiple processes and systems can be connected to one and the same strategy, and vice versa, this categorisation does not help to operationalise the platform economy into measurable types.

**Figure 8 Typology I: based on profit orientation and interaction modality**

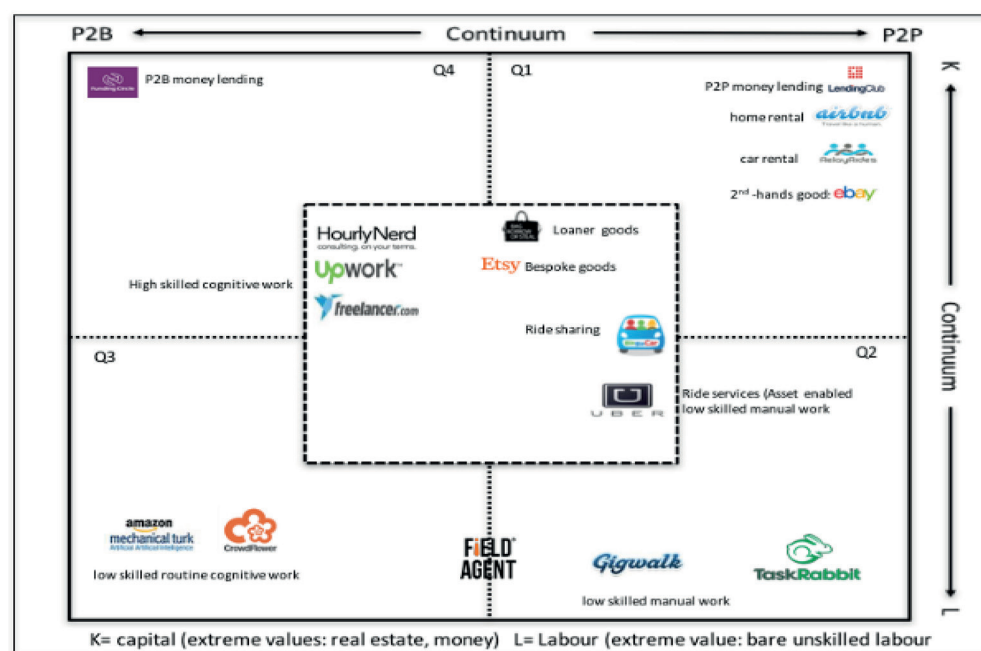


Source: Codagnone et al. (2016), p. 23.

Therefore, the following broad categorisation is considered more suitable to the purpose at hand. This is the distinction made by the Institute for Prospective Technological Studies of the EU in a paper by Codagnone et al. (2016, p. 21), using three categories: (1) recirculation of goods (second-hand, surplus-goods markets) (2) increased asset utilisation (production factor markets), and (3) service and labour exchanges (labour market). It is broad enough to still include newcomers, but specific enough to separate different transactions in different markets. The latter is important when making the connection to the System of National Accounts, either or not via Satellite Accounts.

Based on the brief review of definitions and categorisations above, it is apparent that a clear-cut typology of platforms is not easy to make. Most criteria imply a continuum underlying the categorisation, instead of mutually exclusive types. Codagnone et al. (2016) propose the following typology, in two consecutive steps: (1) a first typology based on the criteria of profit orientation and interaction modality (seen from the platform), and (2) a second typology based on a breakdown of interaction modality into asset mix. The three criteria vary on an underlying continuum. Profit orientation varies from not-for-profit to for-profit. Interaction modality varies from organisation-centered/led to peer-to-peer centered/led. Asset mix varies from capital to labour. Hybrid forms prevail under both typologies, as can be seen in Figures 8 and 9.

**Figure 9 Typology II: based on interaction modality and asset mix**



Source: Codagnone et al. (2016), p. 23.

In Typology I, in the first quadrant of the matrix (Q1), not-for-profit platforms based on collaborative networks of organisations are included. However, according to Codagnone et al. (2016, p. 23) this is an "empty set". Furthermore, the not-for-profit peer-to-peer platforms in quadrant 4 (Q4) are considered "marginal types" from a regulatory perspective. These are often times locally organised platforms with a temporary existence without much money involved. These platforms do provide potential for social innovation, however, and therefore, it is not a domain that should be disregarded from an economic development and growth perspective. In quadrant 2 and 3, the commercial platforms are

categorised. These offer the advantages of reduced search costs and other transaction costs, the commercial utilisation of (underutilised) resources, and a reduction of risks. They vary in terms of being organisation-centred/led (business-to-peer, business-to-business, government-to-government) or peer-to-peer between two individuals (e.g. peer-to-peer lending platforms), but with hybrid forms in between (e.g. peer-to-business platforms). A principal advantage of P2P is the removal of transaction costs, lower prices, and personal exchange in some cases.

Following the first typology, a second typology is derived by Codagnone et al. (2016) by breaking down the commercial platforms further by now including on the horizontal axis the interaction modality and on the vertical axis the asset mix (see Figure 7). The interaction modality varies from peer-to-business on the one end of the continuum to peer-to-peer on the other continuum. These platforms are in most need of regulation, according to the authors, and since these are all commercial, one can assume most money goes around within these types.

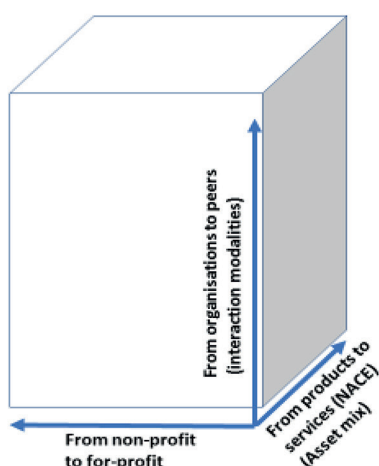
In view of the standard business classification system used by national statistical offices, Platform Typology II (Figure 7) would require a third dimension to assess whether the exchange concerns products or services, and of which class exactly. The Standard Business Categorisation ('Standaard Bedrijfsindeling': SBI or NACE) is a hierarchical classification system of all the economic activities distinguished by the Statistics Netherlands (CBS) to categorise business units according to their main activity. The SBI distinguishes between five levels.

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Summing it up, this brings us, for the time being, to a three-dimensional typology of online platforms, as presented in abstract form in Figure 10 below, with: (i) business models, ranging from for-profit to not-for-profit, (ii) relationship modalities, ranging from B2P to P2P and (iii) the products and services that are exchanged (if possible related to NACE/SBI-coding).

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**Figure 10 Three-dimensional typology of online platforms**





This typology fits the different types of online platforms mentioned in paragraph 2.4. (Figure 4). Possibly another dimension could be incorporated, that is part of the typology of Evans & Gawer: the distinction between transaction, innovation and investment platforms. It could be seen as an extra layer in the product and services mix dimension. Also some of the platform types distinguished by the organization Platform Hunt could be incorporated in the typology. Certainly when one looks for a typology that covers the wide range of online platforms, including social media, search engines and innovation platforms.

## 4. Debated issues of online platforms

This paragraph describes some of the impacts and issues that were mentioned in the literature and during the interviews concerning online platforms. It is certainly not an exhaustive list and is mainly based on SER (2015) and OECD (2018).

### **Businesses**

#### *– Innovation and productivity*

Both enterprises and organisations as well as individuals that function as suppliers (pro-sumers) can benefit from online platforms. For example: online platforms make it easier for companies and individuals to become immediately visible to and communicate with a large and often worldwide base of consumers or users. This relates to the democratisation of markets: small and large businesses alike have the same opportunities to reach potential customers or users and do marketing. Online platforms can also help to reduce transaction costs, take care of logistics and secure payments, as well as possibilities to target groups with advertisements, especially now most people are spending more time on the internet.

Online platforms also contribute to innovation and creativity. For instance, platforms make it easier and quicker to share and profit from innovative ideas, resources, free flow of information/knowledge and they stimulate co-operation, resulting in more innovation. This applies to all kinds of collaborations, that is B2B, C2B, S2B or G2B or even more complex eco-systems of temporary collaborations, such as innovation and development platforms.

Productivity and efficiency go up, because online platforms allocate resources better and more efficiently. They balance supply and demand much quicker and, as said, online platforms make it easier to lower transaction costs. And, finally, productivity is also enhanced, because there is a constant pressure to do so from the large number of participants, that are active on online platforms.

#### *– Disruption and (unfair) competition*

Strong innovation dynamics of online platforms can in the short run lead to disruptive and thereby negative effects on traditional businesses and their workforce. However,



even with disruption<sup>28)</sup>, in the long run the positive effects appear bigger for businesses and consumers, i.e. lower prices, more choice, more competition and more innovation. If the phenomenon of online platforms leads to lower prices and lower transaction costs and therefore more sales, the economic cake would become bigger. Even if the cake remains the same, the question then is who benefits from the cake: to whom goes which part of the value added? A part of the cake will now go to the online platforms. To what extent do the other players in the market benefit from it or not<sup>29)</sup> (see also the international trade issue).

Enterprises and individuals in the traditional economy have to comply with rules regarding, for example, the terms and conditions of employment, competition, safety, environment and tax payments. It is often unclear if and how these rules and regulations apply for the world of online platforms. In some cases existing rules are circumvented by online platforms, because it is part of their business model. This can create an uneven playing field between existing and new players in the economy. Also, it happens, that more powerful and financially stronger online platforms buy new innovative entrants in their market and incorporate them into their own business (e.g. market power of Google-like businesses). With this, potential innovation can be nullified and the switching costs for new entrants are raised.

– *Taxes*

The new world of online platforms also raises the question to what extent the current system of taxation can function in this new environment? On the other hand, platforms could play a role in collecting taxes from providers and users.

– *Lock-in effects and winner takes all*

The 'lock-in effect' is used to explain a practice, where a business makes it extremely hard for their customers to leave them, even if the customer wants to. This can also be applied to the participants of online platforms. A situation can arise where the online platform becomes so successful and powerful, that there is ample room for other online platforms in the same industry. This makes it hard for participants to change to another online platform, which can lead to "the winner takes all" and thus to losers who have played the game to attract more participants less well. In some cases, they end up functioning in a niche market. The question then is whether this removes the competitive character of the market? The 'monopolist' which has most of the market power then determines the competitive game and the prices.

– *International trade*

Online platforms can enlarge international trade, that is cross-border transactions. Firstly, by making it easier for providers to enter or expand to global markets. That is especially important for SMEs. Secondly, international supply of products and services is also beneficial for consumers, as this increases their access to global wide products and services and their range of options. As mentioned earlier, from a statistical point of view, the growth of international trade through online platforms is a challenge, because transactions become less visible in current statistics, partly because businesses reside outside the country concerned.

<sup>28)</sup> In some cases, platforms lead to more regulation of markets. Look at, for example, platforms in the music industry, where there has been a shift from unregulated and free downloads to the use of more regulated platforms, such as Spotify.

<sup>29)</sup> This question is directed more to online platforms in the B2P or B2B business (platform economy in general), and less to the peer-to-peer and sharing economy.

Many online platforms, especially the big and powerful ones, reside in the United States and China. This raises the question which part of the economic cake of a country is skimmed by these international businesses, but also the question to what extent these online platforms can be held accountable for abiding the local rules.

– *Labour markets*

There are two points of view about the labour market position of people working for online platforms. On the one hand, the opinion is that online platforms directly or indirectly create new jobs, especially for those people who want to organise their work themselves in a flexible way and those who want to work part-time, at their own convenience. Therefore, online platforms change the way work is organised. And with this, a part of the online (digital) work has become independent from time and space. Platforms also make it easier to find a job or task, also in an international perspective.

On the other hand, the opinion is that the new jobs that are created in the platform economy often are poor when it concerns, among others, pay, job security, social protection and training possibilities. Work is also increasingly divided into tasks instead of jobs. This puts pressure on existing employment policies. In addition, the ease of access to work for online platforms anywhere in the world increases the competition in the supply of labour, from local to global, especially when it concerns digital work.<sup>30)</sup> This also puts further pressure on earnings. Another question concerning online platform labour markets, is to what extent people are dependent on their work for an online platform or does it mainly concern incidental income for students, for example?

– *Regulations*

When an innovative online platform enters a market and threatens the existing businesses, often there is a call from these enterprises for more protection rules and interventions from government, sometimes under the pretext of unfair competition. Even if there is unfair competition, it still remains important to preserve and give the innovative dynamics that online platforms bring with them a chance. That makes it difficult to find the right measures to control the negative side effects of the behaviour of online platforms. Self-regulation and co-regulation (co-operation between public and private sectors) are two options. However, it is often difficult to determine if regulations are applicable and if so which regulations are applicable. This also often raises the discussion if an online platform is legally an intermediary or an ICT company or a full-fledge supplier of goods and services in the industry concerned (e.g. Uber). In the latter case, they have to comply with existing regulations, which could undermine their business model. Because online platforms often work cross-borders, it is also a question how regulations are tuned internationally.

– *Deferred profit*

When online platforms are launched, often they do not make a profit directly. They have to rely on investors. The idea is that online platforms have to attract sufficient participants and gain market power. Only then they can stand on their own feet. With online platforms, this process can take a long time and it can go wrong (see Travel Bird in the Netherlands).

<sup>30)</sup> This might be comparable with the trend of outsourcing.

## Consumers

- *More choice, lower prices and more information*

Besides the fact that online platforms facilitate the possibility for individuals and households to engage in the production of goods and services, online platforms are also beneficial for individuals and households as consumers. For example, they have lower search costs (mostly no charge), more (international) choice, more information and they can compare prices and providers and can buy from international sellers. More competition of online platforms can also lead to lower prices and better quality.

- *Privacy and consumer protection*

Mostly there is only access to an online platform when you provide information about yourself and your surfing behaviour. This makes it difficult to offer or use goods and services anonymously. Data about the behaviour of their users and providers are important for online platforms. They use these data, for example, to set up algorithms to attract more participants to the platform, to match users to advertisements and stimulate more activity to create value. However, online platforms are often vague in terms of what kind of data they collect, what they do with these data and, even more problematic, to whom they sell the data. Online platforms are also not very transparent about how algorithms based on collected data work.

There are also risks with respect to the behaviour of online platforms concerning consumer protection rights. For example, (i) to what extent are online platforms responsible for the behaviour and actions of their providers, users and advertisers (e.g. terrorism, pornography and intellectual property rights violations); (ii) to what extent are they responsible for product safety, (iii) how do they deal with consumer protection rights (including dispute regulations, handling and monitoring of complaints) and (iv) how does the right to give consent for the use of personal data work in practice. Or more generally: who owns the data? Finding a good balance between privacy on the one hand and innovation possibilities on the other is another issue. Or to what extent can data be or not be shared between online platforms?

- *Social effects*

Online platforms are becoming more and more part of peoples' lives. They use platforms, for example, to talk with friends and family, to look for news and to shop or share products and services. Online platforms, especially social media, also stimulate people to come together and cooperate, socialise and take care of each other, even though the geographic distance is large. Online platforms can also support people with their education and provide all kinds of information and knowledge on a wide range of subjects (e.g. tasks, health, music and science). Online platforms in the social domain can also strongly contribute to the collaboration between citizens and governments, for example by exchanging ideas and opinions.

On the other hand, (social ) online platforms also make it possible to spread fake news and misinformation. This can affect the trust in online platforms negatively. Online platforms can also contribute to the so-called 'confirmation bias', where people tend to look at information that is consistent with their beliefs. This is reinforced by the algorithms online platforms use. These algorithms are based on the number of specific clicks. In that case, the user is confronted with even more of the same content and ideas, even though that is not the specific intention of the platform. This also relates to democracy and which values are strengthened by (foreign) online platforms (e.g. social polarisation).

– *Trust*

The attractiveness, growth and market position of online platforms is also based on trust, reviews and rating systems. It is not very clear how these rating systems influence the behaviour of the users and the providers of online platforms and their trust in these platforms. Valid statistics are missing. It is also the question how truthful and representative these ratings and reviews are. Think, for example, about the use of so-called 'bots' (an internet software program) to post spurious positive reviews. Also the level of the price of a good or service can play a role in combination with trust. A buyer will rather take the chance if the price of the good or service is also low.

– *Inequality to profit*

Online platforms in the sharing economy provide individuals the chance to generate extra income by sharing, lending or renting their under-used assets. However, only those people can benefit who already have these assets (e.g. room, car, tools and skills) to offer. On the other hand, possession is no longer necessary to use certain (expensive) goods or services.

– *Sustainability*

The sharing economy holds the promise for a more sustainable environment by giving access to under-used resources to people who cannot or do not want to buy new products. This could lead, for example, to less depletion of natural resources, less energy consumption and less CO<sub>2</sub> emissions. But also waste is decreased and the sale of second-hand goods may reduce production needs (overconsumption). The main question here is whether these promises are actually achieved?

## 5. Indicators and their measurement

### 5.1 Indicators

Now that there is more clarity about the definition of online platforms, the next step is to identify key statistical indicators to be measured in a monitor. On the one hand, there is the need to separate online platforms from the traditional economy. This means specific indicators for online platforms and their operations, the providers (supply), the users (demand) and the advertisers, as well as the transactions. On the other hand, for comparison reasons, there is a need to link these indicators with existing statistical indicators and domains. Another precondition is that the cost of collecting the data and the survey pressure has to be kept as low as possible. Therefore, the descriptive indicators mentioned here are restricted to basic characteristics of online platforms and their providers and users, namely:

**Online platform (specific):**

- Basic information: Name and address of owner of the platform (incl. the headquarters). One enterprise can have more than one online platform. This could result in a heat map of locations: number of online platforms in a SBI/NACE group and growth or decline;

- Basic information: Url(s) of the online platform(s);
- Basic information: The birth date of the online platform(s);
- Basic information: Geographic reach of the platform's operations (local – global);
- Basic information: Type of platform (see typology);
- Basic information: Products and services which are exchanged, if possible related to the SBI/NACE-group(s), that is: number of online platforms in an industry;
- Basic information: Type of providers: professional – non-professional;
- Basic information: Advertisement parties involved (including click-throughs and commissions<sup>31)</sup>);
- Basic information: sharing economy (broad and narrow definition)(yes/no);
- Economic information: Business model: profit - non-profit, commission-based – advertisement-based or a combination. Other sources of income from other services or add-ons. Or more general: how does the online platform make money?
- Economic information: Number of persons employed (employers + employees; see LFS) and their characteristics. This includes hours worked and number of jobs. This involves persons directly employed by the platform (e.g. maintaining software, administration and promotion);
- Economic information: Turnover (see SBS and STS). The annual or quarterly turnover of the online platform, including the source of the turnover (see business model). Including the percentage of turnover in the specific SBI/NACE-group. This must be distinguished from the volume and prices of transactions;
- Economic information: Value added, i.e. turnover minus costs for intermediate goods and services and intermediate consumption;
- Economic information: Type of investors and investments made in the online platform;
- Economic information: Tax payment;
- Economic information: Type of network effects: what drives the growth of the online platform (e.g. more participants, more transactions, more content etc.);
- Economic information: who sets the prices and circumstances of the delivery of the product or service;
- Social information: verifying providers and their offers and checking for illegal content (yes/no);
- Social information: Collection of data of providers and users (yes/no) and the uses of these data (e.g. algorithms and selling of data);
- Social information: training provided (yes/no), social security payments (yes no), system for complaints and privacy of participants.

#### **Providers (of an online platform):**

- Basic information: Total number of unique providers (active or passive) and listings<sup>32)</sup>. Growth or decline;
- Basic information: Individual-household or business;
- Basic information: Background characteristics of the providers (who);
- Basic information: Reasons to use an online platform;
- Basic information: Type of goods or services offered (what; related to SBI/NACE-coding<sup>33)</sup>);
- Basic information: sharing economy (e.g. use of idle assets);
- Economic information: Number and growth/decline of transactions per year, including prices and turnover. Possible through the estimate: average price x number of transactions per year (minus transaction costs);

<sup>31)</sup> In fact, this involves indirect effects of the advertisements on online platforms.

<sup>32)</sup> One provider can have more than one listing on an online platform.

<sup>33)</sup> Or CPA-coding.

- Economic information: Costs made to use the online platform (commission and/or access);
- Economic information: Investments and value added;
- Economic information: Tax payment;
- Economic information: International trade/cross-border transactions (percentage compared to all transactions);
- Economic information: main source or supplementary source of income;
- Social information: If the provider has working relationship to the online platform (relates mostly to indirect employment): hours worked and earnings (does this constitute the main income). Account should be taken of the fact that people can work for or be associated to more than one online platform;
- Social information: total income, social security, legal contract and training possibilities.

#### **Users (of an online platform):**

- Basic information: Total number of unique users. Numbers, growth or decline and location;
- Basic information: individual-household or business;
- Basic information: Background characteristics (who);
- Basic information: Number of visits to an online platform per year;
- Basic information: Type of goods or services bought or shared (what), including prices;
- Basic information: Reasons to use online platform(s);
- Economic information: Number and growth/decline of transactions per year (money spent, including the commission to the platform);
- Economic information: International trade/cross-border transactions (percentage compared to all transactions);
- Social information: Trust in platforms (e.g. role of reviews and rating systems);
- Social information: Number of complaints;

The basic information should be enough to look at some major impacts, like displacement effects, effects on prices, market power and abiding to legal rules (e.g. labour and privacy). For every industry there will also be specific impacts. For example, the arrival of Airbnb can have an effect on the availability and prices of houses.

## **5.2 Measurement: possible sources of information**

The indicators mentioned above can be measured in different ways. In general, the experience until now is that it is not easy to get good quality data about online platforms, their providers and users. An important condition is that a population of online platforms is available. At the moment that is not the case. An option is to start with the most important online platforms, limiting the number. Some methods are better for particular actors like providers, users or the online platforms. When it concerns cross border trade, international co-operation is an important prerequisite.

Possible options of data collection are:

1. *By setting up a dedicated questionnaire.* Questionnaires can be sent to providers and users, but especially to the online platforms. However, the general (international) experience is that most online platforms are not very willing to share their information. Besides, they often have less information about their users. A possible option is to make the supply of their data to the National Statistical Office mandatory by law (stick), even when their headquarter is outside the Netherlands.

*Advantages:* Good quality data with less effort. In a dedicated questionnaire more questions can be included; Results are more quickly available.

*Disadvantages:* Most online platforms are not very willing to share their data or sometimes they do not have all the data. Online platforms which have their headquarter outside the Netherlands cannot be forced by law to supply statistical data; Need to set up own infrastructure and population (higher costs);

2. *By including a set of questions as a module in an existing survey.* Surveys that are possible candidates are, for example, the Labour Force Survey (working conditions) and the statistic ICT usage of persons<sup>34)</sup> and to a lesser degree the statistic ICT usage of enterprises.<sup>35)</sup> Other possible statistics are the Budget or Time use surveys or the Business Cycle survey (COEN-enquête). Unfortunately, at the moment, the Budget and Time use surveys are conducted only every five years. These surveys can target the providers and users of online platforms. They do not target the online platforms themselves.

*Advantages:* The availability of an existing infrastructure and population.

*Disadvantage:* Results may only be expected from 2020 onwards or even later; Not all questions can be included, because there is always limited space in existing surveys for extra questions.

3. *By web scraping.* Web scraping can be useful in two ways. Firstly, if there is already a list of online platforms (with URLs) available. With web scraping, a part of the desired information from the websites of online platforms can be collected (including financial accounts). This is not always a straightforward exercise. Although this is usually difficult, the online platform and the providers can be targeted using this method. The second option is to create a population of online platforms on the basis of a web search of the whole internet (Dutch domain) with a robot. The robot then should be able to distinguish "normal" websites from websites with online platforms on the basis of available data from the web search. This involves machine learning<sup>36)</sup>.

*Advantages:* Availability of a population of online platforms;

*Disadvantages:* This is not an easy method to implement; It is also difficult to use if it concerns users of online platforms.

4. *Administrative sources (registers).* A good and easy example of this is to couple a list of online platforms with URLs to the Business register. This opens up possibilities to get data on turnover and (direct) employment. Another option is to look at tax data (the turnover of providers and online platforms) or employment data (Polis). Another option to look at are may be credit card payments.

*Advantages:* Rather quick first results; not too difficult to implement.

*Disadvantages:* It is not known if the list of online platforms used is comprehensive. Enterprises can also have more than one platform.

<sup>34)</sup> See the appendix of this paper.

<sup>35)</sup> These statistics have a small sample size.

<sup>36)</sup> This could also be done with the business register as a source.

## 6. Discussion and concluding remarks

It is clear that the emergence of all kinds of online platforms in the last ten years provides innovative benefits for providers and users. On the other hand, these developments bring many risks with it on fair competition, trustworthiness, consumer rights and decent working conditions. This requires at least some government regulation, whether or not together with the industry, but also restraint not to frustrate these innovative developments. To get a good picture of online platforms, (new) data are needed. Given the complex situation of online platforms with, among others, more groups of participants, it is a statistical challenge to actually obtain these data from all respondents.

From the consultations it becomes clear that different organisations have different statistical needs when it concerns online platforms. Some focus on a broader approach of online platforms in general (a platform monitor), and then especially the big online platforms in the economy. Some focus more on the online platforms of the sharing economy as a new economic phenomenon, such as Eurostat. In any case, it is clear that until now good and valid statistical data are missing. The main question then is, where to start?

A first step is to decide which groups of online platforms should be researched? That is: the (big) transaction online platforms in general or only focus on platforms in the sharing economy? At least, exclude social media, search engines and innovative platforms that are especially focused on businesses alone?

A second step is to develop a population of online platforms or, if necessary, start with an available list of online platforms. As far as the latter is concerned, at the moment for the Netherlands there are two lists of online platforms available: one at the EU and one at the University of Utrecht. A disadvantage is that both lists focus more or less on the sharing economy. These lists with online platforms can then be coupled with the Dutch Business Register (ABR). This link opens up possibilities to build a statistical dataset of online platforms (including turnover and employment). Also, web scraping techniques can be used to track online platforms on the internet and develop and maintain a population of online platforms. However, this will be a much more complex exercise.

A third step is to include a few questions in existing surveys and then especially the statistics on ICT usage of businesses and persons. Based on an European agreement, some questions about the use of online platforms are already included. This concerns providers (businesses) and users of online platforms. One should be aware that no data can be collected through these statistics on the online platforms themselves. Therefore, the sample of the statistic on the ICT usage of businesses is simply too small.

To collect data on online platforms themselves, it is probably the best option to target them with a separate survey. The advantage is that more questions can be included in the questionnaire and, more importantly, that results are available more quickly. However, as said, the precondition is that there is a list with online platforms available. In this case, it is important to determine which indicators should be included in the questionnaire: which variables are relevant for online platforms?



Another option is to use the Labour Force Survey to look at the working conditions of people who work permanently or temporarily for online platforms.

For a typology of online platforms, in general three characteristics are of importance, that is: the interaction modality (from B2B to P2P), type of transaction (for-profit to not-for-profit) and type of product or service. Another option would be to use the categorisation of Evans and Gawer. The question is, however, if this typology differentiates enough between types of online platforms. At least, it could be combined with the classification of economic activities (NACE). Online platforms that are active in more than one economic activity should be categorised on the basis of the centre of gravity of their activities.

In the context of the National Accounts, a question is whether only economic transactions (in money or in kind) should be included. That limits the scope more or less to an economic perspective.

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## 8. Appendix: some provisional figures

Although it is not part of the goal of this paper, in this appendix some figures are presented on the use of online platforms in the Netherlands. These figures are from existing surveys from Statistics Netherlands (CBS).

It concerns statistics on the ICT-use of persons and enterprises. The figures on the ICT-use of persons are provisory, and are about the use of Airbnb- and Uber-like platforms, where private persons are the providers. Therefore, this is a part of the sharing economy. See paragraph 8.1. This information is supplemented with information on the competitive feeling towards Airbnb-like platforms among officially registered tourism accommodations in the Netherlands, like hotels, bungalow parks and camping grounds. These figures come from the yearly survey of the Tourism Accommodation Statistics.

The figures from the ICT-use of enterprises deal with the impact of online platforms on the turnover of enterprises (supply-side). See paragraph 8.2.

### 8.1 The use of Airbnb- and Uber-like online platforms in the Netherlands

Airbnb, Windu, Homewey and Booking are examples of enterprises that operate as online platforms, or website or apps, for vacation home renting services where private persons are the host.<sup>37)</sup> On the one hand people can offer their room, apartment or house for short term rent on these platforms (supply-side). On the other hand people can search for and rent the offered accommodations (demand-side).

These online platforms receive a commission for each transaction from both the host and the tenant. Most of these platforms have their base in America. They do not own tourism accommodations themselves, but they function purely as intermediaries between suppliers and users of holiday accommodations. Most of these online platforms started in the period 2008-2010. Especially Airbnb has gained a large market share quite quickly. Not only does this platform dominate the supply of holiday accommodations through online platforms, but the rental market of Airbnb is also becoming increasingly important in the total rental of tourism accommodations in general. Although there are no reliable figures, it is estimated that about 5 to 10% of the overnight stays in the city of Amsterdam now take place in accommodations rented through Airbnb.<sup>38)</sup> Besides non-professional hosts, nowadays Airbnb also facilitates more and more the renting of holiday accommodations by professional hosts. That can be professional renting of a number of rooms, apartments and houses together, but also the renting of rooms of small hotels and bed and breakfasts. Although Airbnb started as a peer-to-peer platform, therefore, at the moment this online platform can be classified more or less as a hybrid platform, which is used both by professional as well as non-professional hosts. The online platform Booking.com has

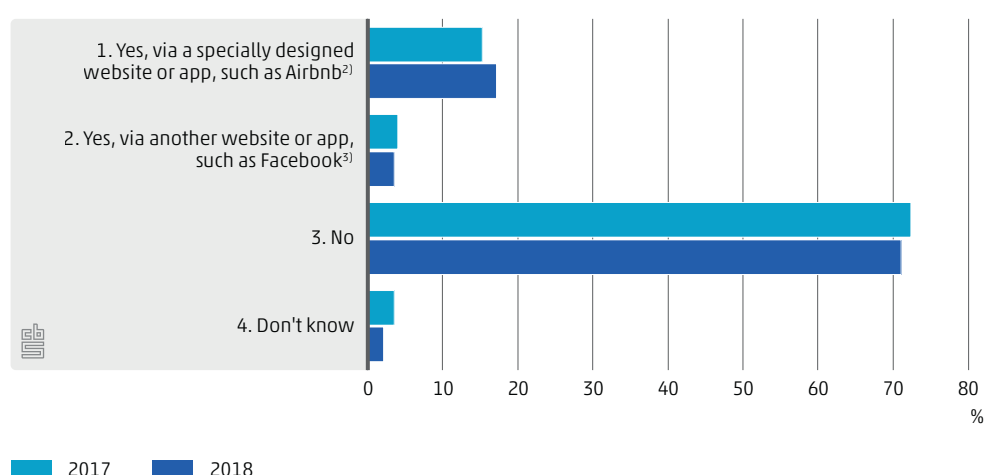
<sup>37)</sup> Including leisure as well as business tourists.

<sup>38)</sup> <https://www.parool.nl/amsterdam/airbnb-gebruik-in-amsterdam-niet-verdubbeld~a4492059/>

followed the opposite way. This online platform started as an intermediate between professional suppliers of hotel rooms and potential customers. At the moment, however, it is also moving, at least partly, towards a peer-to-peer platform in the sharing economy where non-professionals can offer their rooms, apartments and houses for rent. Other online platforms, like Wimdu, HomeWay, TripAdvisor and Flipkey, have a much smaller market share than Airbnb. Rental of holiday accommodations through online platforms and then especially Airbnb is under pressure everywhere. The idea is that this contributes to the decrease in the availability of the number of houses for the local housing market, higher housing prices and that it causes more and more nuisance for the local population who live there.

### 8.1.1 Use of Airbnb-like accommodations from private persons by Dutch citizens (12 years and older), 2017<sup>1)</sup> and 2018<sup>1)</sup>

*Survey question: Have you booked an accommodation with a private person, such as a room, apartment or holiday home, in the past 12 months through a website or app?*



Source: Statistics Netherlands.

<sup>1)</sup> Figures provisional.

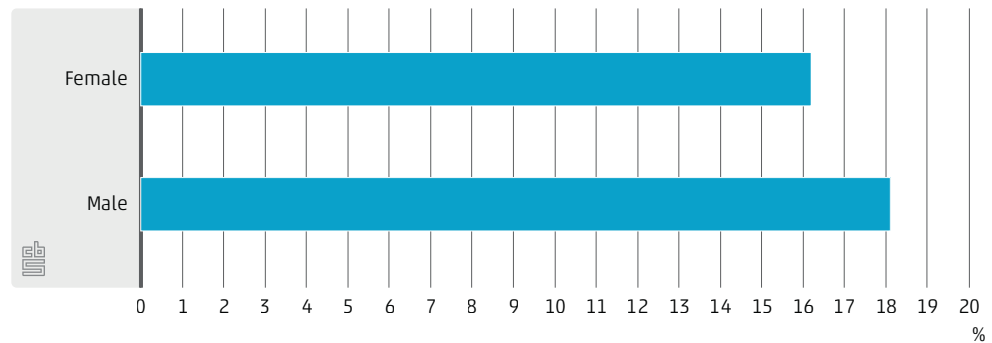
<sup>2)</sup> Survey option: Yes, via a specially designed website or app on which private individuals offer accommodation, such as Airbnb or Huizenruil.com?

<sup>3)</sup> Survey option: Yes, via another website or app on which private individuals offer accommodation, such as Marktplaats or Facebook?

Table 8.1.1 shows the use of Airbnb-like platforms by Dutch citizens in the years 2017 and 2018 (provisional figures). About 21 percent of the Dutch used an Airbnb-like accommodation in 2018 from a private person, including renting through platforms like Facebook and Marktplaats (Dutch eBay). In 2017 this was a little bit more than 19 percent. As expected, there is a growing market. The question does not make it clear if this renting of Airbnb-like holiday accommodations was in the Netherlands or abroad. Also the number of times somebody rented a holiday accommodation through an online platform from a private person per year (number of transactions) and the price was not asked.

The persons who used in 2018 Airbnb-like online platforms to rent their holiday accommodation from a private host are especially high educated persons in the age group of 25-44. Men use these online platforms more than women. See Figures 8.1.2.a – c.

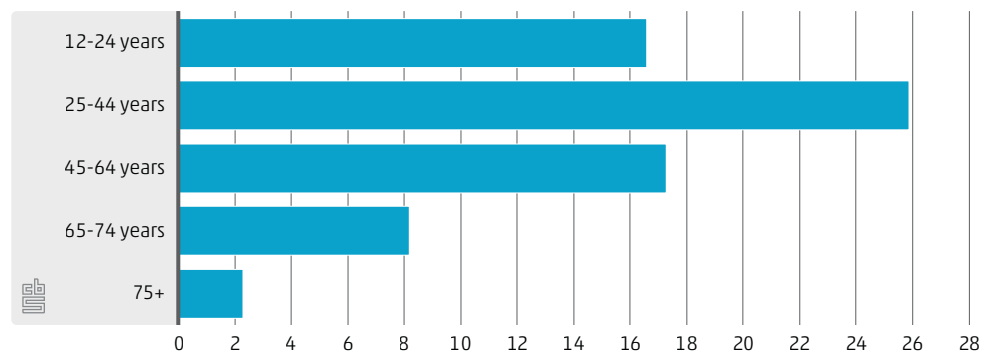
### 8.1.2.a Gender of Dutch citizens that used Airbnb-like online platforms to rent a holiday accommodation from a private person, 2018<sup>1)</sup>



Source: Statistics Netherlands.

<sup>1)</sup> Figures provisional.

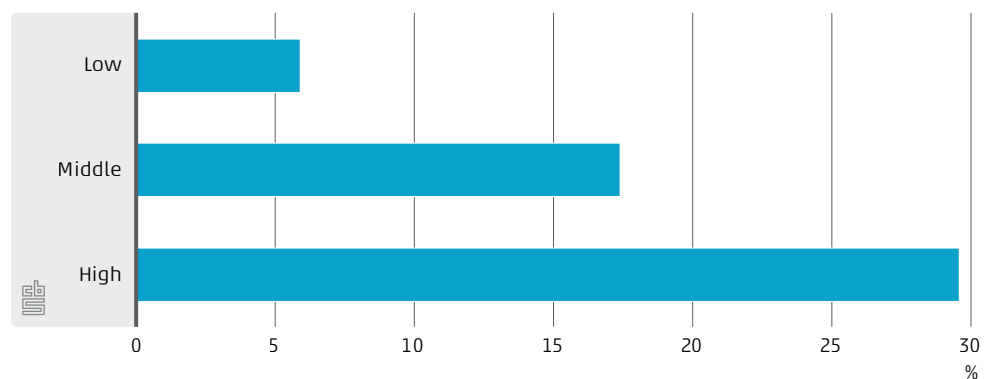
### 8.1.2.b Age of Dutch citizens that used Airbnb-like online platforms to rent a holiday accommodation from a private person, 2018<sup>1)</sup>



Source: Statistics Netherlands.

<sup>1)</sup> Figures provisional.

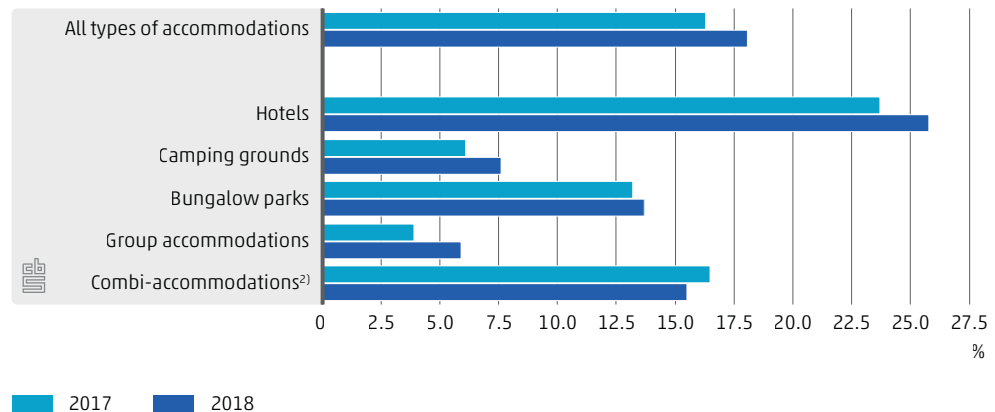
### 8.1.2.c Education level of Dutch citizens that used Airbnb-like online platforms to rent a holiday accommodation from a private person, 2018<sup>1)</sup>



Source: Statistics Netherlands.

<sup>1)</sup> Figures provisional.

### 8.1.3 The feeling of competition from Airbnb-like online platforms by type of tourism accommodation in the Netherlands, 2017 and 2018<sup>1)</sup>



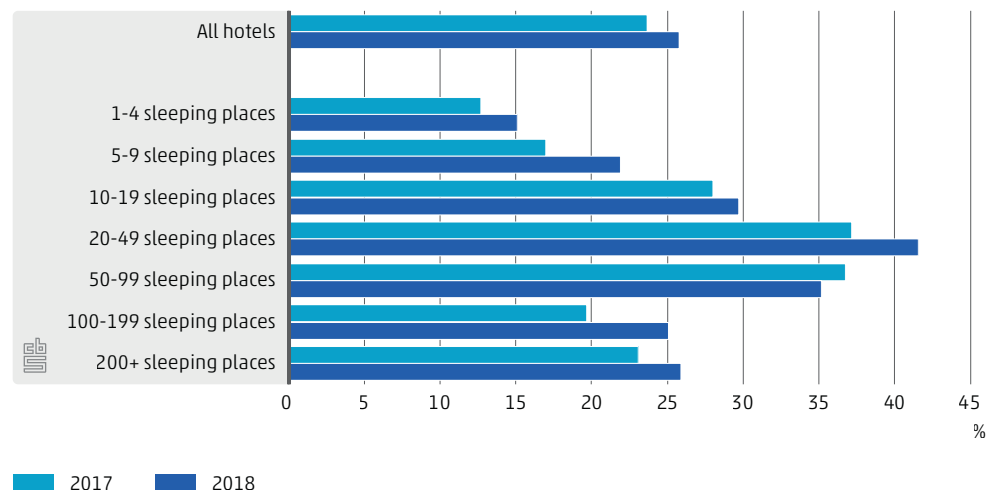
Source: Statistics Netherlands.

<sup>1)</sup> Figures provisional.

<sup>2)</sup> Combi-accommodations are a combination of different types of accommodations, for example a bungalow park with a camping ground.

If one looks at the supply side of tourism accommodations, according to the Tourism Accommodation Statistics from the Netherlands, in 2018 more than a quarter of the hotels in the Netherlands say they experienced some kind of competition from online platforms such as Airbnb. For other accommodation types, such as bungalow parks, camping grounds and group accommodations, this feeling of competition is much less. See Figure 8.1.3.

### 8.1.4 The feeling of competition from Airbnb-like rentals by the size of the hotel, 2017 and 2018<sup>1)</sup>



Source: Statistics Netherlands.

<sup>1)</sup> Figures provisional.

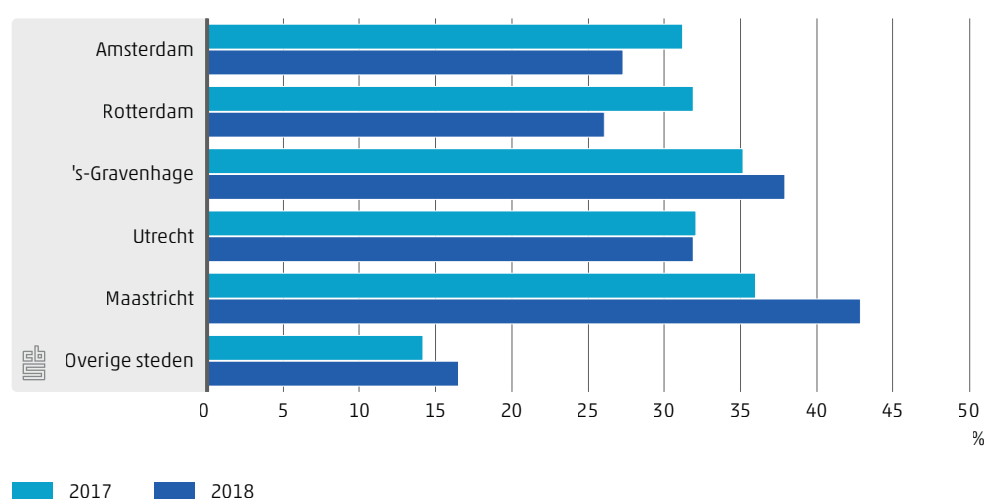
The feeling of competition from Airbnb-like accommodations is especially high for hotels with 10-99 sleeping places and less for the smaller hotels with less than 5 sleeping places.

See Figure 8.1.4. The idea is that these small hotels or bed and breakfasts themselves are also active on Airbnb-like platforms. The feeling of competition from Airbnb-like accommodations among hotels is also higher in big cities, like Amsterdam, The Hague, Rotterdam, Utrecht and especially Maastricht. See Figure 8.1.5.

Almost all along the line the feeling of competition from Airbnb-like online platforms is increasing between 2017 and 2018. For all types of accommodations this feeling of competition grew from 16,3 percent to 18,1 percent between 2017 and 2018. If one looks at the size of the hotels, then the feeling of competition increased the most among hotels with 20-49 sleeping places. Among these hotels also the feeling of competition is the highest. The feeling of competition from Airbnb-like online platforms dropped somewhat in Amsterdam and Rotterdam. This does not fit the general picture. The idea is that this was mainly caused by the change in the composition of the accommodations in these cities. The number of hotels with less than 5 sleeping places grew much stronger than hotels with more sleeping places. For these small hotels the feeling of competition from Airbnb-like online platforms is relatively low.

It must be realised that there is a situation of a growing tourism market. The last seven years the number of tourists in the Netherlands, domestic and foreign, has grown considerably.<sup>39)</sup> That means that renting through Airbnb-like online platforms will partly be complementary to the overnight stays in registered tourism accommodations, like hotels, camping ground etc. and not totally competitive.

### 8.1.5 The feeling of competition from Airbnb-like rentals among hotels by city, 2017 and 2018<sup>1)</sup>



Source: Statistics Netherlands.

<sup>1)</sup> Figures provisional.

When one looks at the sector of taxi and carpool services, Uber is the biggest online platform in this domain. Other players, especially in the carpool services, are Blablacar and Togethr. Recently also ViaVan has been launched in the Netherlands. From the taxi

<sup>39)</sup> <https://opendata.cbs.nl/statline/#/CBS/nl/dataset/82058NED/table?ts=1541773514148>

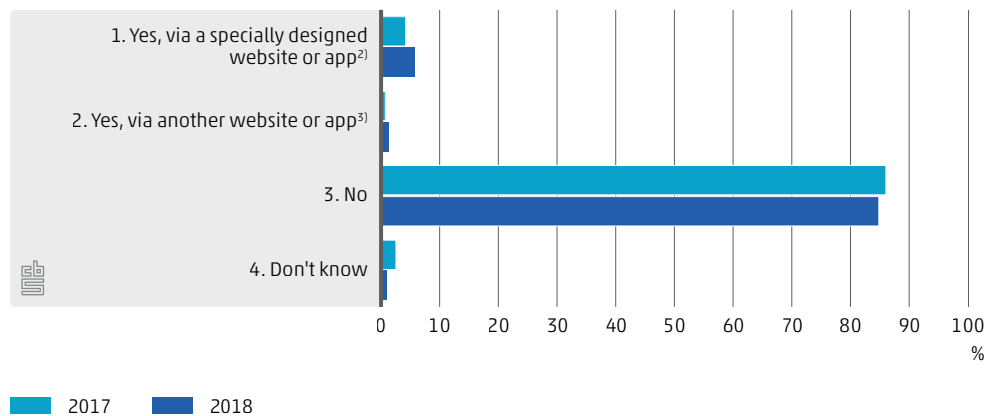
businesses the online platform Sneleentaxi has been started. All these platforms have different business models. Through their app Uber brings customers together with taxi drivers, professionals as well as non-professionals. Uber, that started in 2009, asks a commission for every ride. Uber also earns money by selling customer information they collect. Blablacar focuses more on long distance drives or drives between cities where the passenger pays for the gasoline. Initially Blablacar did not ask any commission, but from off 2011 that has changed.

Different than in the sector of tourism accommodation services, the taxi business is not especially a growing market. This means that the arrival of more suppliers (taxi's), also through online platforms, lead to more competition, resulting in displacement effects and lower prices. In the Netherlands this has not been researched yet, but this can be seen in cities such as New York and San Francisco.<sup>40)</sup> In these cities, Uber and Lyft have created a lot of competition for the traditional taxi services, that often did not go along with innovation.

In the Netherlands in 2018 about 7 percent of the population (12 years and older) made use of Uber-like transportation services which was supplied by a private person. In 2017 this was 5 percent. Although their role is not as big as in America, this makes it clear that also in the Netherlands the role of online platforms in the taxi services is increasing. See Figure 8.1.6.

#### 8.1.6 Use of Uber-like taxi services supplied by private persons by Dutch citizens (12 years and older), 2018<sup>1)</sup>

*Survey question: In the last 12 months, have you ordered a transport service, such as a taxi ride, with a private person via a website or app?*



Source: Statistics Netherlands.

<sup>1)</sup> Figures provisional.

<sup>2)</sup> Survey option: Yes, via a specially designed website or app on which private persons offer a transport service.

<sup>3)</sup> Survey option: Yes, via another website or app where private individuals offer a transport service.

<sup>40)</sup> <https://www.cnet.com/news/best-black-friday-2018-walmart-deals-playstation-4-and-xbox-one-for-200-99-google-home-hub-bose-headphones-9/>



## 8.2 The impact of online platforms on the turnover of enterprises

By Andries Kuipers (Statistics Netherlands)

This paragraph deals with the question: What the perceived impact of online platforms is on the turnover of enterprises operating in the same market? There are a number of reasons to expect this will be perceived as a positive impact. One of the most important ones is the increase of the market as a whole and thus for the individual enterprises involved. There are also a number of reasons why this can be perceived as a negative impact. For instance when the platform reduces the prices on the market or charge a disproportionately high fee for the participating enterprises.

In the survey on the ICT-usage of enterprises, a question was included on the perceived impact of online platforms on the turnover of the enterprise. Online platforms were defined as platforms for e-commerce used by several suppliers to sell their products. Examples given were Booking, Bol, eBay, Amazon, Airbnb, Uber.

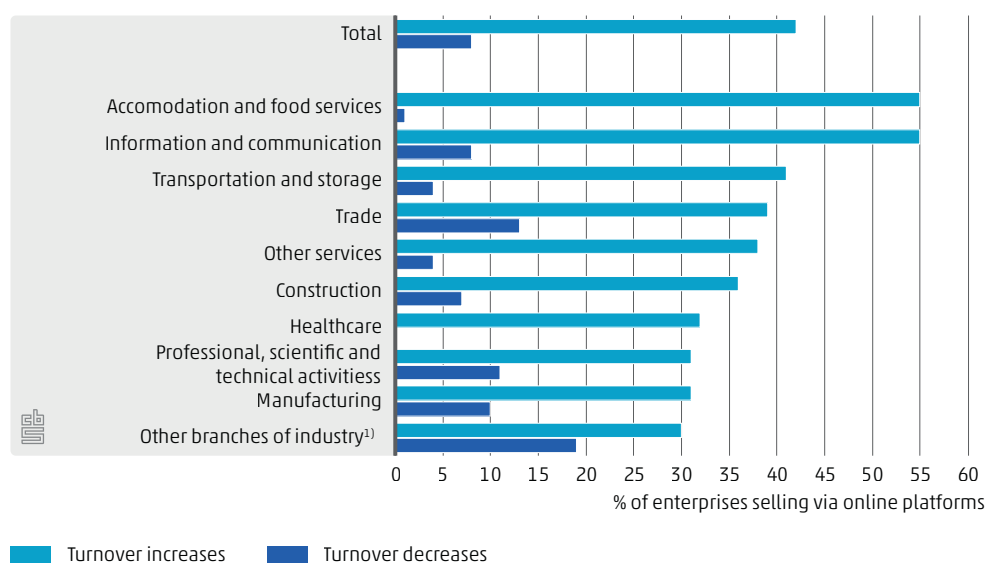
The question was phrased as follows: *What is your perception of the impact of the existence of online platforms in your branch of industry, on the turnover of your enterprise?*

(Possible answers: Negative (turnover decreases), Neutral (turnover stays more or less the same), Positive (turnover increases), I am not aware of online platforms in the branch of industry of our enterprise).

### Outcome

Four out of ten (42%) enterprises selling via online platforms indicated a positive impact of these platforms on their turnover. One out of ten (8%) perceived a negative impact of

### 8.2.1 The perceived impact of online platforms on the turnover of enterprises, by branch of industry, 2017



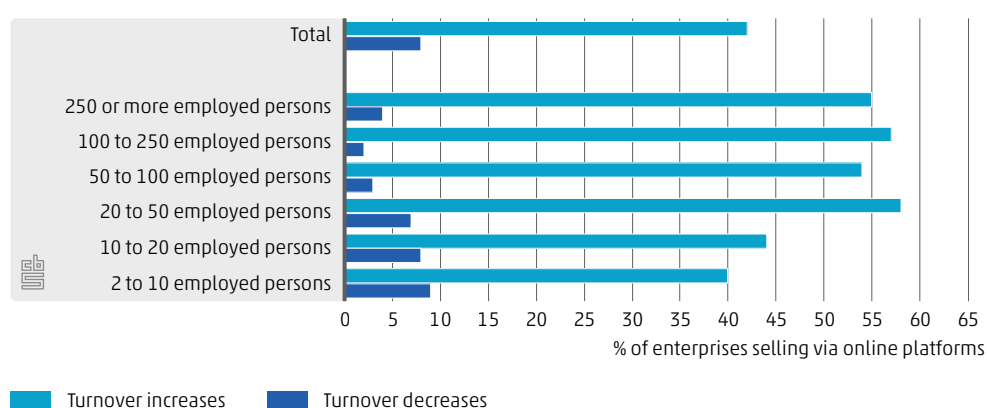
Source: Statistics Netherlands.

<sup>1)</sup> Energy & water, Financial sector, Real estate activities.

online platforms on their turnover, although they sell via online platforms. The remaining enterprises indicated no significant impact on their turnover because of the online platforms. So, for all enterprises the balance of positive and negative impact is 34 per cent.

By branch of industry enterprises in the accommodation and food services and the information and communication sector are most frequently positive about the impact of online platforms on their turnover. Over 10 per cent of the enterprises in the trade sector are negative about the impact of online platforms on their turnover, although they make use of one or more of these platforms. For all branches the balance of positive and negative answers is at the advantage of the positive ones.

### 8.2.2 The perceived impact of online platforms on the turnover of enterprises, by size class, 2017



Source: Statistics Netherlands.

By size class of the enterprises it are not especially the small enterprises who benefit from online platforms. On the contrary, smaller enterprises are less frequently positive and more frequently negative on the impact of online platforms on their turnover. Although one might argue that it could be a good alternative for smaller enterprises: selling via a platform instead of developing the online service itself.

#### Methodological comment

The question on the impact of online platforms was also presented to enterprises which sell online, but solely via their own website and/or apps. However, they were also surprisingly positive about the impact of online platforms on their turnover. While one might expect that these enterprises felt the online platforms more as competitors. One explanation might be that the impact of so called intermediate websites (e.g. price comparison sites) is judged as positive but these sites are not recognized as online platforms; in the end you sell via your own website and/or app. Another explanation might be that the enterprise has misjudged his own website as an online platform of which the enterprise of course says that it increases its turnover. It is obviously difficult to explain in a few words what should be understood by online platforms.

Besides this it is hard for an enterprise to judge the impact of online platforms on its turnover. From the perspective of an individual enterprise every single transaction via an online platform is seen as an increase of its turnover. But if the market as a whole grows more, the enterprise involved loses market share and might not be so positive after all.

## Explanation of symbols

Empty cell	Figure not applicable
.	Figure is unknown, insufficiently reliable or confidential
*	Provisional figure
**	Revised provisional figure
2017–2018	2017 to 2018 inclusive
2017/2018	Average for 2017 to 2018 inclusive
2017/'18	Crop year, financial year, school year, etc., beginning in 2017 and ending in 2018
2015/'16–2017/'18	Crop year, financial year, etc., 2015/'16 to 2017/'18 inclusive

Due to rounding, some totals may not correspond to the sum of the separate figures.

## Colophon

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