WORKING PAPER

Eurofound

Digital age

Platform work: Types and implications for work and employment – Literature review

Employment and working conditions of selected types of platform work

Contents

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Acknowledgements: The authors would like to thank Lea Schmidlechner and Sara Riso for their input into earlier versions of this paper. Also, gratitude is extended to participants of the expert group meetings held at Eurofound in April 2017 and April 2018, whose valuable input has benefitted this review.

Eurofound reference number: WPEF18004

Related report: Digital age: Employment and working conditions of selected types of platform work

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Introduction

Over the past years, developments in digital technology have fuelled the emergence of online platforms that match the supply and demand of goods and services. The commercial and non-commercial activities coordinated through platforms are often referred to as 'the collaborative economy' (De Groen et al, 2017; European Commission, 2016b). Within this economy, a new form of work has spread across a growing range of industries, including design, web and software development, IT and writing. Also, locally delivered tasks such as childcare, dog walking, transport, tourism, or legal services are mediated through online platforms (Valenduc and Vendramin, 2016).

In this working paper, the term 'platform work' refers to a new form of organising and mediating paid work through platforms. Platform workers are accessed through the internet to solve specific problems or supply services in exchange for remuneration (Eurofound, 2015; Green et al, 2013; Saxton et al, 2013; Stone et al, 2016; Valenduc and Vendramin, 2016).

The platform functions as an intermediary market place for tasks across various fields (Eurofound, 2015; Felstiner, 2011; Valenduc and Vendramin, 2016). Not all tasks or projects may be equally suited to be outsourced to the crowd (Kittur et al, 2013), but it is likely that some parts of almost every job may be performed through platform work (Eurofound, 2015). It is important to note that platform work with this definition excludes platform-based activities such as renting out homes (like Airbnb) or online second-hand retailers (like Ebay).

Prominent examples for platform work platforms are Amazon Mechanical Turk (also called MTurk or AMT), Clickworker, Deliveroo, Listminut, PeoplePerHour, TaskRabbit, Uber and Upwork.

As part of Eurofound's research activities on 'work and employment in the digital age', and more specifically its research strand related to platforms, this paper aims to provide a review of relevant literature on platform work, notably as regards the different emerging types of platform work and the related working conditions, legal developments and trends and changes in the labour market. Desk research was conducted during 2017 and early 2018 and has included the use of journals on innovation, industrial relations and social policy in the EU, academic/research works, court proceedings in the U.S. and the EU up until January 2018. Furthermore, as developments in the work related platform economy are ongoing, this review refers to newspaper and magazine articles that provide the most up-to-date information at the time of writing (early 2018). Additionally, the review benefits from the input of two expert group (19 April 2017 and 18 April 2018) on the topic of platform work.

The first section discusses the different concepts and definitions of platform work and describes how platforms operate and how work is organised through them. Subsequent sections will provide an overview of the characteristics of platform work, reflecting the growing heterogeneity of this new form of employment. Further discussed is the composition of the platform workforce, their working conditions and their legal employment status. The annex at the close of the paper lists and links to work related platforms and labels them according to Eurofound's typology of platform work.

Definition and mode of operation

Many different terms are used to describe activities that are mediated through platforms, such as gig work, on-demand work, work-on-demand via apps, platform work, digital labour, digital (gig) economy, crowd sourcing, piecework and collaborative consumption (Aloisi, 2015; Botsman, 2013; Codagnone et al, 2016b; Fabo et al, 2017; Heeks, 2017). Different terminology used for the phenomenon and a poor definition of what is comprehended under each term has led to different estimations of the extent of platform work and has consequences for how policymakers address issues arising from this new form of work (DG IPOL, 2017).

The Directorate General for Internal Policies noted the positive and negative connotations associated with terms such as 'sharing economy', 'collaborative economy' and 'gig-economy' and supports the European Parliament's Committee on Employment and Social Affairs in using the term 'platform economy' and 'platform work' as the most neutral to discuss these activities (DG IPOL, 2017, p. 21). Similarly, EU OSHA (2017, p. 13) uses the term 'online (labour) platform work' which they define as including 'all labour provided through, on, or mediated by platforms, and which features a wide array of standard and non-standard working arrangements/relationships, such as (versions of) casual work, dependent self-employment, informal work, piecework, home work and platform work, in a wide range of sectors. The actual work provided can be digital or manual, in-house or outsourced, high- or low-skilled, on or off-site, large- or small-scale, permanent or temporary, all depending on the specific situation.'

Box 1. Eurofound's definition of platform work

Platform work refers to an employment form that uses a platform to enable organisations or individuals to access other organisations or individuals to solve specific problems or to provide specific services in exchange for payment. Accordingly, the focus of the research is on platforms matching supply and demand for paid labour. The main features of platform work, as it is understood in this project, are:

- Paid work organised through platforms
- Three parties involved: platform, client, worker
- Aim is to conduct specific tasks or solve specific problems
- Form of outsourcing/contracting out
- Break-down of 'jobs' into 'tasks'
- On-demand services

As the main traded good is labour, not the material or capital good itself, sales platforms (like eBay) or platforms on which access to accommodation is provided (like Airbnb) as well as financial services fall outside the scope of this understanding. Furthermore, non-commercial transactions (like volunteering, networking, social media (such as LinkedIn) or any other form of transaction not involving payment, like Couchsurfing that match supply and demand for accommodation without remuneration) are not considered to constitute platform work.

Actors

There are generally three types of actors involved in platform work, namely 'client', 'worker' and 'platform' (Blohm and Zogaj, 2014; Leimeister et al, 2015; Leimeister et al, 2016).

- Firstly, there is the party which sources or requests tasks ('client'). The client may be a company, an institution, a group, or an individual.
- Secondly, there is the crowd which potentially could performs tasks ('worker'). Workers tend to be individuals or micro/small companies.
- Thirdly, there is the platform which intermediates, and partly also coordinates and manages interactions between the other two parties by providing the infrastructure for the exchange between supply and demand.

Platform work is sometimes described as a three-sided architecture, or a three-sided market (Schmidt, 2016). However, the three actors have different levels of control over the interactions. Often, as platform operators lay the infrastructure, the platform has a stronger controlling role vis-à-vis the client and the worker in the interactions that take place through the platform. In some circumstances, the level of control that platforms exert over the

interactions may make them into more than mere informational service providers (EU-OSHA, 2017; Hill, 2015a). Several authors point out that platforms are considered to function as labour brokers, and even that in 'some ways they *act* more as an employer' (Aloisi, 2015, p. 3; Leimeister et al, 2016). Platforms often claim to be solely an intermediary, thereby denying the role and responsibilities of an employer. This has been contested in individual and collective cases, for example, in the UK in *Farrar and Aslam v Uber* (Employment Tribunals, 2016). Similarly, in April 2018 in France, 10 Uber drivers brought a case to the labour court in Paris (Le Conseil de prud'hommes) with the request to change their employment status from independent contractor to employee (Padych, 2017). The role of the platform was also questioned by the European Court of Justice in 2017 (ECJ, 2017) (see section 'Role of the judiciary').

Box 2. Two-sided versus multi-sided markets

Platforms are alternatively referred to as 'two-sided markets' or 'multi-sided markets' (Hagiu and Wright, 2015; Rochet and Tirole, 2003). Although a theoretical differentiation is useful, platforms may not be a pure form of either category. It is argued that the two-sided versus multi-sided dichotomy should rather be seen as a continuous scale on which platforms may have characteristics of either market to a more or lesser extent and on which platforms may move from one type of market to another over time as their mode of operation changes (Codagnone and Martens, 2016, pp. 8-9). A notable example is Amazon, which started as an online retailer (strictly two-sided), but which has evolved over time to include the coordination of transactions between other retailers and customers (multi-sided) (Hagiu and Wright, 2015).

Mode of operation

The work process in platform work contains several steps:

- Identification of needs: The client (individual or organisation) realises a need for skills or resources (that is, demand for a task/project to be realised), which one or several workers can supply and which can be matched through a platform. Similarly, workers identify their needs for tasks or projects that can be offered through a platform.
- Initiation: Clients or workers advertise the required or offered skills, tasks or projects on the platform. The advertising process can happen in different ways. On a platform that allows contests, a client launches a call to a broad and unspecified audience. Alternatively, platforms with an infrastructure for direct procurement/offer allow the client to address a specific worker or group of workers, to invite them to deliver a service (Eurofound, 2015; Mandl and Curtarelli, 2017; Wexler, 2011). If the process is initiated by the workers, it is them advertising their skills and experiences on the platform.
- Response: The client or worker responds to the advertisement by outlining the skills on offer, the requirements for the task, placing a bid, or commencing negotiation.
- Evaluation: Following, actors evaluate the offer through the information made available. Depending on the specific mode of operation, this can be done by the client, the worker or the platform, with or without the involvement of an algorithm.
- Selection: The client determines which worker or group of workers is awarded the task, or in the case of contests, which contributor is awarded the prize (Eurofound, 2015). In a worker-initiated process, the worker selects the tasks/projects offered by

clients. In both cases, it can also be the platform (through an algorithm or a selection process realised by their staff) who selects.

- Delivery: After agreement among the involved parties, the service is being realised by the worker.
- Finalisation: After delivery of service, remuneration takes place, either online through the platform or directly between the client and the worker. The client, worker, or both, can rate or review specific and/or general aspects of the party they worked with. Ratings build into an online reputation that is generally confined to a single platform and that help the platform to recommend certain workers to certain clients (Silberman and Harmon, 2017; Sundararajan, 2016).

Box 3. Rating

Platforms can exert much control over workers through rating mechanisms (Newlands et al, 2017). Client ratings have become a 'major decentralized and scalable management technique' that puts the onus of quality control entirely with clients, and which creates 'a generalized culture in which the service providers are continually pushing to self-optimize and cater to the customer's every whim' (van Doorn, 2017, p. 903).
A study of drivers and clients of ride-sharing apps showed that clients did not always understand the real value of rating options, nor the impact their rating has on the driver. Furthermore, the rating mechanisms created a service mentality among providers (Lee et al, 2015) which results in an entanglement of emotional labour with the corporate endeavour to a new and more far-reaching extent in 'algorithmically-managed' transportation tasks compared with other types of employment (Raval and Dourish, 2016). They conducted 18 semi-structured interviews and surveyed 121 drivers of Uber, Lyft and the now defunct SideCar of whom 45% rated the effectiveness of the rating system as very poor. The drivers indicated frustration with clients' seemingly arbitrary 1 to 5 star rating without explaining their rationale.
Similarly, Cockayne (2016) has noted that ratings can function as a method to impose discipline and control over people's behaviour and can serve to ensure that the worker's behaviour aligns with what the rating requires.

Scale and scope of platform work

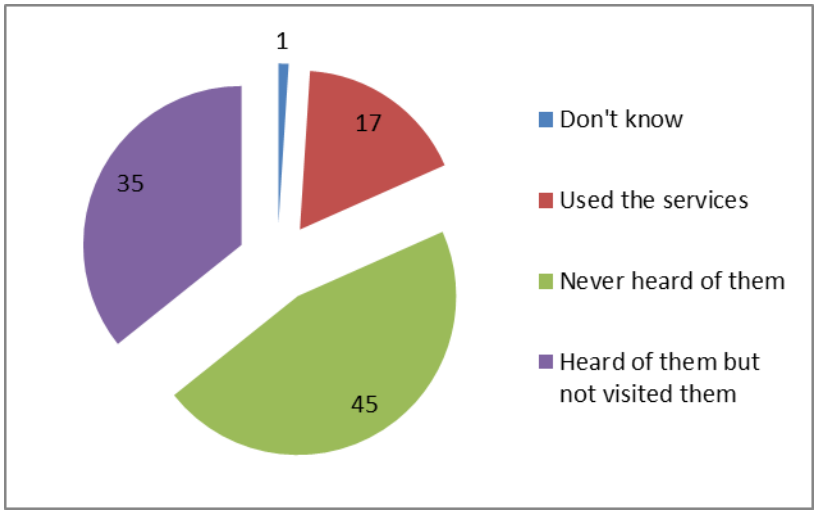
Exact numbers on the scale and scope of platform work remain difficult to ascertain and the volume of work and of traded tasks is similarly difficult to estimate. In most EU Member States, platforms are not legally obliged to make available information on the number and volume of transactions. However, live tracking of platforms and users (such as Ipeirotis (2010) and Lehdonvirta (2016)) as well as datasets compiled through web crawling (such as De Groen et al (2016) and Fabo et al (2017)) provide some insight into the scale and scope of platform work.

General awareness and use of platforms in the EU

Between 15 and 16 March 2016, the Eurobarometer interviewed by telephone 14,050 respondents from the 28 EU Member States. Respondents were prompted on their knowledge and use of 'collaborative platforms' which they defined for the interviewees as follows: 'A collaborative platform is an internet based tool that enables transaction between people providing and using a service. They can be used for a wide range of services, from renting accommodation and car sharing to small household jobs' (European Commission, 2016c, p.

Q1). It is important to note that this definition includes activities that go beyond Eurofound's definition of platform work.

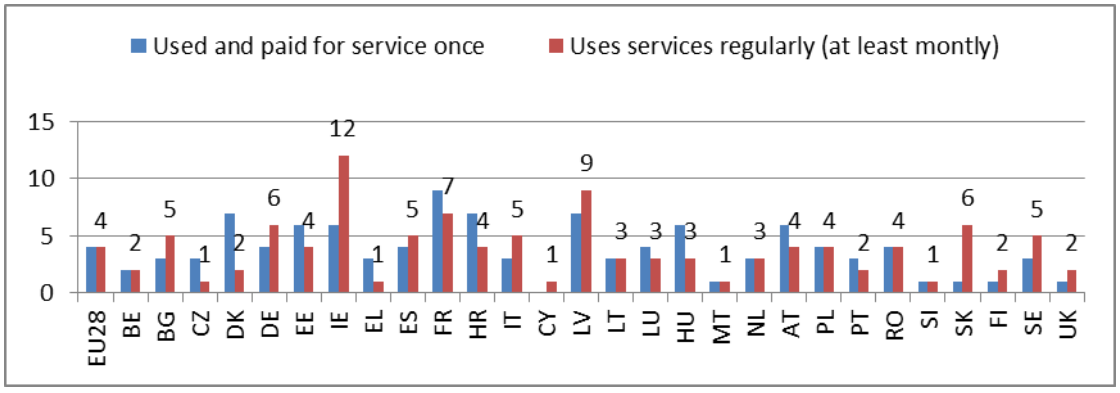
Figure 1: Proportion of population that have experience with platforms, EU28, 2016



Source: Eurobarometer by the European Commission, 2016c, p. 6.

Across all 28 Member States, 17% of respondents had used a collaborative platform at some stage as a service provider or client. Of the group of respondents who had used a platform, 5% said they offered their services regularly (every month) (European Commission, 2016, p. 4). In a comparison of countries, respondents in France (36%) and Ireland (35%) were most likely to have used collaborative platforms, whereas respondents in Cyprus (2%) and Malta (4%) were least likely to have done so (European Commission, 2016, p. 6).

Figure 2: Proportion of population that have used platforms, by country, 2016



Source: European Commission, 2016c.

Number of platforms

Evans and Gawer (2016) estimate that globally there are approximately 300 operational 'workplace platforms', such as Upwork, TaskRabbit and Fiverr. Due to a winner-takes-all dynamic 'digital economy' (Degryse, 2016), many platforms are very small, while a few large platforms capture a major share of the market (Kuek et al, 2015).

As regards the EU, the European Commission-funded study of Belgium, France, Germany, Italy, the Netherlands, Poland, Spain, Sweden and the UK, estimated that by 2015, 273 collaborative platforms (comprising work platforms as well as rental and accommodation platforms) had been founded in these countries (Vaughan and Daverio, 2016).

In 2017, the JRC gathered data on 199 domestic and international platforms in the EU28 through desk research, excluding so called 'zombie platforms', which appeared operational but had nearly no activity, 'still born platforms', for which an app or platform had been made as proof of concept, but which had never taken off, and 'mayfly' platforms, which appeared to be taking off but could not gain a critical mass of users. Of these 199 platforms, 173 are work related platforms. The researchers collected information on each platform on the company website as well as through the media (Fabo et al, 2017). France and the UK were found to have about 50 platforms each. Germany, the Netherlands and Spain had about 40 platforms. Belgium and Italy had about 30 platforms each. Most other countries in the EU28 had about 20 or fewer platforms (Fabo et al, 2017, p. 10).

Many platforms originate from the large European economies, such as France, Germany and the UK. Further, nearly 15% of 199 platforms were of non-European origin, of which almost two-thirds originated in the U.S. (Fabo et al, 2017, p. 9).

In contrast to the JRC's data, national research finds that the number of sharing economy platforms in Estonia which are operational in the sectors of collaborative finance, transport, accommodation and travel, private services and education, has tripled from 17 in 2013 to 48 in 2016 (Eljas-Taal et al, 2016). Further, Finland was found to have 37 platforms in the collaborative economy in 2016 which were active in collaborative finance, accommodation, peer-to-peer transport, household tasks and retail (PWC, 2017). It is not clear for Estonia nor Finland how many of these platforms are work related platforms.

For Norway, Jesnes et al (2016) found the country had 30 platform work platforms and 30 'capital platforms' (such as Airbnb and Etsy) in 2015.

In Italy in 2016, the annual event Sharitaly, organised by Collaboriamo and the Trailab laboratory of the Catholic University of the Sacred Heart, estimates that approximately 31% of 138 sharing economy platforms had reached more than 30,000 workers and clients and could be counted as 'active' (Ciccarelli, 2016). According to this estimate, there would be approximately 43 active platforms in Italy. Shareitaly reports nearly half these active platforms are work related, specifically handling transportation and household tasks and so the number of active work platforms somewhat approaches the JRC's estimation of about 30 such platforms.

Platform revenue and market share

Global platform revenue and market share

Based on compiled gross service revenue data, Kuek et al (2015) estimated that in 2013, three platforms, namely Upwork, Freelancer and the Chinese professional task platform Zhubajie/Witmart, together held 50% of the global online professional task market. In the global micro task market, comprising those platforms on which projects and tasks are broken down into micro tasks for which workers are usually paid per piece of completed work, CrowdFlower (now Figure Eight) and AMT accounted for an estimated 80%. The study mentions that Staffing Industry Analysts estimated the total market was about $1.6 billion (€1.3 billion) in 2013 and $2 billion (€1.7 billion) in 2014 (Kuek et al, 2015, p. 19).

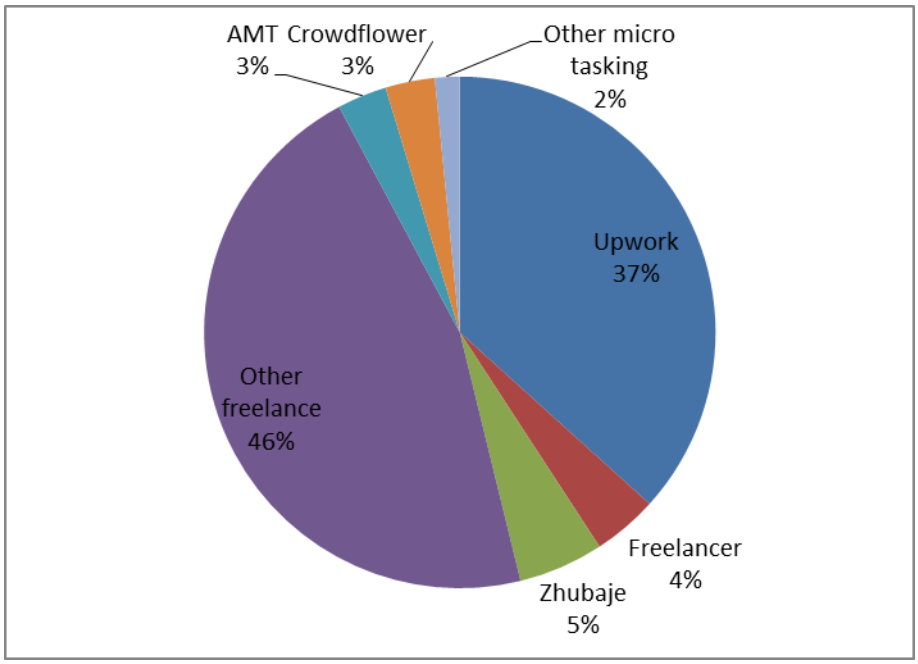
Table 1: Global market for online platform work, 2014

Category	Share of the market in $, millions (€, millions)
Online micro task	$160 (€130)
Online professional task	$1,900 (€1,550)
Total	$2,060 (€1,700)

Source: Kuek et al, 2015, p. 19.

For the three largest professional task platforms and the two largest micro task platforms, Kuek et al (2015, p. 20) have estimated their share of the market and the size of the total market. In figure 3, the pie represents the total market revenue of $2 billion (€1.7 billion).

Figure 3: Share of individual platforms of the global market, by annual revenue, 2014



Source : Kuek et al, 2015, p. 20.

Further, table 2 below shows the revenue of the three largest platforms for professional tasks and two of the largest micro task platforms in 2014. The final column indicates the market share that each of these platforms was estimated to hold.

Table 2: Revenue and market share of the largest global platforms, 2014

Platform	Annual revenue in $, millions	Annual revenue in €, millions	Proportion of global market in %
Upwork	750	610	37
Freelancer	84	68	4
Zhubaje	110	89	5
Other professional task	940	764	46
AMT	64	52	3
CrowdFlower	64	52	3
Other micro task	32	26	2

Source: Based on Kuek et al, 2015, p. 20.

Platform revenue in the EU

The European Parliament estimated that the value of transactions through collaborative platforms in the EU totalled €28.1 billion in 2015[1], which nearly doubled the €15.9 billion in 2014 (European Parliament Pressroom, 2017). Platforms' revenue also increased from an estimated €1.8 billion in 2014 to €3.6 billion in 2015. Transactions within online labour markets for both skilled and unskilled work, which corresponds to Eurofound's definition of platform work, were estimated to have totalled values of €2.7 billion in 2015.

In 2015, household tasks mediated through platforms in Belgium, France, Germany, Italy, the Netherlands, Poland, Spain, Sweden and the UK are estimated to have had a total value of transactions of €1,950 million and platforms' revenue was estimated at €450 million. Online professional tasks saw transactions valued at €750 million and platforms' revenue at €100 million (Vaughan and Daverio, 2016).

National research for Estonia estimated the turnover of sharing economy platforms, which go beyond Eurofound's definition of platform work, to amount to €0.87 million in 2012 and €6.5 million in 2015 (Eljas-Taal et al, 2016). In Spain, platforms in the collaborative economy, comprising work platforms as well as rental and accommodation platforms, are estimated to have contributed between 1% and 1.4% to the Spanish GDP in 2017, which may increase to 2% to 2.9% by 2025 (GOVUP and Adigital, 2017). In Finland, PWC (2017) found there were 37 platform companies operational across the five sectors of the collaborative economy. Only 15% of the total value of €107 million in transactions was estimated to be due to platform work, in particular household tasks (14%).

For 2016, De Groen et al (2017) estimated the size of the work related platform economy based on the total annual gross revenues and number of active workers of 173work platforms in the EU28. The platforms had estimated gross revenue of about €4.2 billion in 2016, which would amount to 0.03% of EU GDP (De Groen et al, 2017, p. 350).

Size of the platform workforce

To calculate the number of platform workers, Valenduc and Vendramin (2016) suggest multiplying the existing number of platforms by the number of registered users, but they point out several caveats, namely, not all platforms are active platforms and not all registered users are active workers. Additionally, an individual may be registered on several platforms (De Groen et al, 2017; Huws et al, 2016).

In 2014, there were estimated about 45 million workers on platforms based in the Western developed world, such as Freelancer (18 million), Upwork (10 million), Crowdsource (8 million) and CrowdFlower (now Figure Eight) (5 million) (Codagnone et al, 2016b). Additionally, there are an estimated 25 million registered workers on platforms based in China, such as Zhubajie/Witmart (10 million), Epweike (6 million), Taskcn (3 million) (Heeks, 2017 references To and Lai, 2015). The table below shows Kuek et al (2015) estimation that only about 10% of registered users are expected to be active workers, but survey results suggest even this may be an overestimation. Carmel et al (2012) estimated that on average about 5% of workers registered on the five Chinese platforms will have earned money through the platform. They provide evidence for two cases. Taskcn had about 3.2 million registered users in 2012, but only about 259,291 had earned money (8.1%). For the platform K68.cn, which had 2.3 registered users in 2012, only 15,245 had earned money (0.7%).

[1] Transactions comprised activities within the collaborative economy, such as accommodation, transport, crowdfunding and lending activities and online labour market places.

Table 3: Global market for online platform work, 2014

Category	Number of registered workers	Number of active workers (% of registered)
Online micro task	5.8 million	580,000 (10%)
Online professional task	42 million	4.2 million (10%)
Total	47.8 million	4.8 million (10%)

Source: Kuek et al, 2015, p. 19.

Studies of platform workers, such as conducted by Huws et al (2017) and DG IPOL (2017) corroborate Kuek et al's (2015) finding that there are many people who have 'at some point' provided a service through a platform (registered as worker), but a much smaller group offers tasks more than occasionally, for instance on a monthly or on a weekly basis (active worker). For example, in Norway only 1.3% (100 workers) of the 7,900 registered Upwork freelancers did an assignment every month (Dolvik and Jesnes, 2017).

Between June and July 2016, McKinsey conducted an online survey of more than 8,000 respondents in Germany, France, Spain, Sweden, the UK and U.S. Based on the survey results for the five EU countries, McKinsey extrapolates the number of platform workers for the EU15 and states that around 9 million people in the U.S. and the EU15 earn money through providing labour on platforms such as Deliveroo, TaskRabbit, Uber and Upwork (McKinsey, 2016). De Groen et al (2017) estimate there may be 12.8 million people active on online work related platforms in the EU28, which appears to be an overestimation in comparison with the global estimate of the active platform workforce. However, the Groen et al do note that this high number may be due in part to over reporting by platforms and that some active workers may have been counted multiple times (De Groen et al, 2017, p. 351).

Between January 2016 and April 2017, FEPS, UniGlobal and the University of Hertfordshire conducted online surveys across Austria, Germany, Italy, the Netherlands, Sweden, Switzerland and the UK (Huws et al, 2017). For this study, platform workers were identified by their affirmation they 'had *ever* sold their labour via a platform in any of the following three categories:

- Carrying out work from your own home for a website such as Upwork, Freelancer, Timeetc, Clickworker or PeoplePerHour.
- Carrying out work for different customers somewhere outside your home on a website such as Handy, TaskRabbitor Mybuilder.
- Carrying out work involving driving someone to a location for a fee using an app or website such as Uber or BlaBlacar' (Huws et al, 2017, p. 16).

Table 4: Number of platform workers, selected EU and EEA countries, 2016

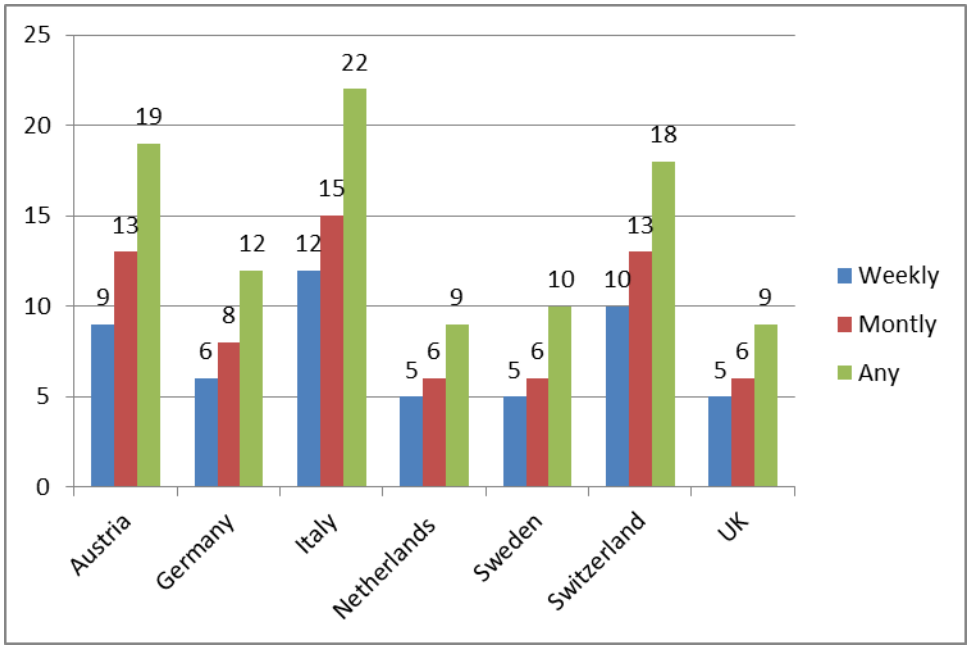
	Number of respondents	No. of respondents who had 'ever' done platform work, (% of respondents)	% of respondents doing platform work weekly	Estimated number of weekly platform workers
Austria	1,969	388 (19%)	9%	540,000
Germany	2,180	281 (12%)	6%	3,560,000
Italy	2,199	494 (22%)	12%	5,310,000

Netherlands	2,126	189 (9%)	5%	600,000
Sweden	2,146	189 (10%)	5%	310,000
Switzerland	2,001	361 (18%)	10%	600,000
UK	2,238	209 (9%)	5%	2,260,000

Source: Using Huws et al, 2017, p. 26.

As seen in the figure below, platform workers are almost evenly divided between occasional workers (monthly) and more frequent workers (weekly), ranging from 47% of all platform workers being frequently active in Austria, to 55% in Switzerland.

Figure 4: Frequency of platform working activities, selected EU and EEA countries, 2016



Source: Adapted from Huws et al (2017).

The UK's gig economy workforce is examined through two other large surveys. In December 2016, the UK's Chartered Institute for Personnel and Development (CIPD) surveyed 5,019 people between the ages of 18 and 70 across the UK in traditional employment, platform work and unemployment. The survey identified platform workers as 4% of all respondents, based on their participation in platform work at least once over the past 12 months (CIPD, 2017, p. 52). Activities included 'performing tasks online, providing transport or locally delivering food or other goods' (CIPD, 2017, p. 4). Extrapolating for the working age UK population of people 16 years old and over, an estimated 1.3 million adults would be active in platform work[2].

To compare, the UK governmental Department for Business, Energy and Industrial Strategy (BEIS) used two survey vehicles to identify platform workers between July and August 2017, the online NatCen Panel survey of 2,184 persons in Britain and the online YouGov Omnibus

[2] Calculation based on 32.1 million UK residents of labour market participation age of a total population of 66.2 million according to the UK Statistics Office in May 2017.

survey in five waves, totalling 11,354 people. BEIS estimates that 4.4% of the whole British population (65 million excluding 1.8 million people in Northern Ireland) worked in the gig economy in the last 12 months (BEIS, 2018a, p. 5). BEIS defines the gig economy as involving 'exchange of labour for money between individuals or companies via digital platforms that actively facilitate matching between providers and customers, on a short-term and payment by task basis'. This definition excludes agency work, matching services such as LinkedIn, online retail such as eBay and accommodation services such as Airbnb and all in all closely aligns with Eurfound's definition of platform work. Extrapolated to the entire population, the size of the gig economy is estimated to be about 2.8 million people[3]. BEIS' estimation adds 500,000 to Huws et al's estimated gig economy workforce, and 1.5 million to CIPD's estimation. Another UK study by the Action and Research Centre (RSA) estimates that there are 1.1 million people in Britain's gig economy, and that around 3% of adults aged 15 and over have tried gig work of some form, which equates to as many as 1.6 million adults in the UK's working age population (Balaram et al, 2017).

Comparing various research on Sweden, Huws et al (2017) note that 10% of respondents had ever done work through platforms, but the Swedish government estimates that about 2.5% of Swedes have ever done so. The Swedish government arrived at this estimate after commissioning a web survey which was conducted in September 2016 and had over 7,000 responses. Although about 4% of people had looked for work on platforms, only about 2.5% of working age Swedes had performed some, translating to about 150,000 people (Statens Offentliga Utredningar (SOU), 2017).

In Denmark, the Danish Labour Force Survey randomly sampled 18,043 Danes between January 2017 and March 2017, and found that 1% of the population had earned money through platform work at least once over the last 12 months (from Q1 in 2016 to Q1 of 2017). Extrapolating for the Danish population, an estimated 42,367 Danes had earned money through labour platforms such as Uber, Upwork and Happy Helper (Ilsøe and Madsen, 2017).

Research from Estonia (Eljas-Taal et al, 2016) indicates that over 1,000 Estonians work in the sharing economy (about 0.1% of the working population), which comprises activities mediated through platforms in finance, transportation, accommodation and travel arrangements, private and personal services and education.

For Finland, PWC (2017) reports that some 30,000 active platform workers participated in the platform economy in 2016. The study refers to 'phenomena where private individuals or other players such as micro-enterprises or small companies share under-utilised resources (for example, product, service, time or skill) via a digital platform'. The study included platforms organising for instance access to finance and accommodation services, thus beyond the scope of Eurofound's understanding of platform work. Sales platforms where objects change owners were not included. In 2017, the Finnish Labour Force Survey found that about 0.3% of Finns aged between 15 and 74 earned more than 25% of their income over the previous 12 months through platforms, which would be approximately 14,000 people (Statistics Finland, 2017). The Labour Force Survey asked respondents whether they had 'during the past 12 months worked or otherwise earned money through the following platforms: 1. Airbnb, 2. Uber, 3. Tori.fi/Huuto.net, 4. Solved, 5. Some other, 6. None of the above'. Those who selected 'some other' were asked to specify.

In Norway, the Labour and Social Ministry commissioned the Fafo Institute for Labour and Social Research (Forskningsstiftelsen Fafo) and the Centre for Applied Research of the Norwegian School of Economics (Norges Handelshøyskole, SNF) to conduct a survey similar to Huws et al (2017). In 2016, the consortium sampled 1,525 Norwegian adults aged 18 and above. 10% of respondents indicated they had done work for a platform at some point and 2%

[3] BEIS has estimated this based on the total population of the UK of 66.2 people, minus 1.8 million residents of Northern Ireland, resulting in the calculation 4.4% of 64.2 million equals 2.8 million active gig workers.

said they performed platform work on a weekly basis (Jesnes et al, 2016). Researchers indicated the percentages had significant error margins and likely overestimated the prevalence of platform work in Norway. Compared with information gleaned from interviews with platforms in Norway, the actual number of workers may be substantially lower than found in the survey (Dolvik and Jesnes, 2017, p. 25). The study was reproduced in 2017 and consequently estimated 0.5 to 1% of the working age population to participate in platform work, translating to between 10,000 and 30,000 people (Alsos et al, 2017). The lower estimation for participation stems from a learning process in the survey questions. In the previous round, the question 'have you done work through digital platforms' resulted in high estimates for participation, but it is possible this meant different things for different people. Therefore, when the 2017 survey concretely indicated tasks and platforms, the proportion of people who answered in the affirmative decreased. The study includes labour platforms but also Airbnb, so the actual proportion of platform workers is likely lower than the percentage indicated.

Uber was not part of the survey, but Alsos et al (2017) obtained data on Uber drivers from the Norwegian tax administration and found that in 2016, UberPop had 1,298 drivers in Norway.

In short: Main findings from literature on the scale and scope of platform work

The literature reviewed for this paper points towards a weak data basis on platform work. This can be attributed to the widespread lack of official registration systems for platforms, workers, clients and revenue generated, resulting in a quasi-non-existence of administrative data. Research (like surveys) is challenged by the absence of a formalised, harmonised definition. This leads to different understandings and research approaches applied by different authors. This makes it rather impossible to come to comparative findings.

Among the explored indicators, the size of the platform workforce is the one followed up by most publications. The available data either refer to the share of platform workers among the workforce or among the population, or to absolute numbers. The variation of the findings is considerable, ranging, for example, from 0.4% to 19% of the population. It can be assumed that this spectrum is to be attributed to methodological issues (notably the definition of platform work and the formulation of the question) rather than the factual existence of such sizeable differences across countries. This argument can be supported by the findings of those studies that differentiate between registered and actual platform workers or between different intensities/frequencies of platform work (for example, whether platform work has been done ever, within the last 12 months, or regularly monthly or weekly).

Interestingly, fewer studies provide data on the number of platforms than on the value of transactions or revenues realised through platforms. Also, these findings do not seem to be very robust in a comparative analysis and hence require cautious interpretation. It is, for example, required to take into consideration the specific definitions applied when trying to understand why a study on selected EU Member States results in a higher number of platforms than studies covering the EU28, and even an almost-as-high-number as studies covering the whole world.

Table 5: Summary of the main literature on the scale and scope of platform work

Source	Definition	Geographic scope	Platforms	Workers	Market size
Alsos et al, 2017	Platform workers of working age on labour platforms but also Airbnb	NO	n.a.	0.5 to 1% of the population (10,000-30,000) Additionally, 2,300 Uber drivers	n.a.
Balaram et al, 2017	Gig economy: using platforms to find small tasks, sometimes completed immediately after request (on-demand)	UK	n.a.	1.1 million people; around 3% of adults aged 15+ have tried gig work of some form (1.6 million)	n.a.
BEIS, 2018a	Gig economy: involving exchange of labour for money between individuals or companies via digital platforms that actively facilitate matching between providers and customers, on a short-term and payment by task basis	UK	n.a.	4.4% of the total population (2.8 million)	n.a.
CIPD, 2017	Gig economy, performing tasks online, providing transport or locally delivering food or other	UK	n.a.	4% of people aged 18-70 (1.3 million)	n.a.

	goods at least once over the past 12 months				
Codagnone et al, 2016b	Digital labour markets: where labour-intensive services are traded by matching requesters and providers	World	n.a.	45 million registered	n.a.
De Groen et al, 2017	Using Eurofound's (2015) definition of platform work	EU28	173	about 12.8 million workers	platforms' revenue: €4.2 billion
DG IPOL, 2017	Platform work through which paid work is mediated	EU28	n.a.	1-5% of people aged 15 and over	n.a.
Eljas-Taal et al, 2016	Sharing economy platforms operational in the sectors of collaborative finance, transportation, accommodation and travel services, private services and education	EE	17 (2013); 48 (2016)	250 full-time employed persons (employees and self-employed) in transport, 739 full-time employed persons in accommodation; 130 employees in the sharing economy	platforms' turnover: €0.87 million (2012); €6.5 million (2015)
European Commission, 2016c	Collaborative platforms, for a wide range of services, from renting accommodation and car sharing to small household tasks			n.a.	n.a.

European Parliament Pressroom, 2017	Collaborative platforms, including accommodation, transport, crowdfunding and lending activities and online labour market places	EU28	n.a.		value of transactions: €15.9 billion in 2014; €28.1 billion in 2015 (thereof €2.7 billion on online labour markets) platforms' revenue: €1.8 billion in 2014; €3.6 billion in 2015
Evans and Gawer, 2016	Workplace platforms such as Upwork, TaskRabbit and Fiverr	World	300 workplace platforms',	n.a.	n.a.
Fabo et al, 2017	Labour platforms	EU28	199 platforms of which 173 fit EF's definition	n.a.	n.a.
Harris and Krueger, 2015	Gig economy involves work in the gig economy involves the use of an internet-based app to match customers to workers who perform discrete personal tasks	U.S.	n.a.	0.4% of the workforce (600,000)	n.a.
Heeks, 2017 references To and Lai, 2015	Online labour: contingent (task- or project-based)	China	n.a.	25 million registered	n.a.

	intangible work delivered digitally and done for money, organised via online outsourcing platforms that are marketplaces bringing together buyers and sellers				
Huws et al, 2017	Platform workers, having ever sold their labour via an platform	AT, CH, DE, IT, NL, SE, UK	n.a.	Ever done platform work: 19% of the population in AT, 12% in DE, 22% in IT, 9% in NL, 10% in SE, 18% in CH, 9% in UK Estimated no. of weekly platform workers: 540,000 in AT, 3,560,000 in DE, 5,310,000 in IT, 600,000 in NL, 310,000 in SE, 600,000 in CH, 2,260,000 in UK	n.a.
Ilsøe and Madsen, 2017	Platform work, earning money at least once over the last 12 months	DK	n.a.	1% of the population (42,000)	n.a.
Jesnes et al, 2016	Sharing economy which comprises work platforms, where one's 'labour is put at the disposal of others' and capital platforms, where under-utilised resources are put at the disposal of others	NO	30 labour platforms and 30 capital platforms (2016)	10% of the population have done work for an platform at some point, 2% performed platform work on a weekly basis	n.a.

Kuek et al, 2015	Online micro tasks and online professional tasks	World	n.a.	47.8 million registered, 4.8 million active	platforms' revenue: €1.3 billion (2013); €1.7 billion (2014)
McKinsey Global Institute, 2016	Digital platforms for independent work, comprising platforms for people to sell goods or lease assets or provide labour services	U.S., AT, BE, DE, DK, EL, ES, FI, FR, IE, IT, LU, NL, PT, SE, UK	n.a.	Estimated 9 million people using platforms to provide paid labour services (4% of working age population)	n.a.
PWC, 2017	Collaborative economy, composed of small tasks and household services; collaborative finance; accommodation and facilities; professional services; peer-to-peer transportation and car-sharing	FI	37	30,000 active platform workers	Value of transactions: €107 million
Statens Offentliga Utredningar (SOU), 2017	Sharing economy in which individuals provide other individuals who are not their acquaintance, access to underutilised resources, property as well as services, against or without payment through digital	SE	n.a.	4% of working age population have looked for work on platforms, 2.5% (150,000) have performed some	n.a.

	platforms or analogue forums				
Statistics Finland, 2017	Earning money through Airbnb, Uber, Tori.fi/Huuto.net, Solved	FI	n.a.	About 0.3% of Finns between 15 and 74 years old had during the previous 12 months earned more than 25% of their income from work related and non-work related platform activities	n.a.
Vaughan and Daverio, 2016	Collaborative platforms comprising peer-to-peer accommodation; Peer-to-peer transportation; On-demand household services; On-demand professional services; Collaborative finance.	BE, DE, ES, FR, IT, NL, PL, SE, UK	273	n.a.	value of transactions: €1,950 million for household services; €750 million for professional services platforms' revenue: €450 million for household services; €100 million for professional services

n.a. – no information available

Source: own compilation

Characteristics of platform workers

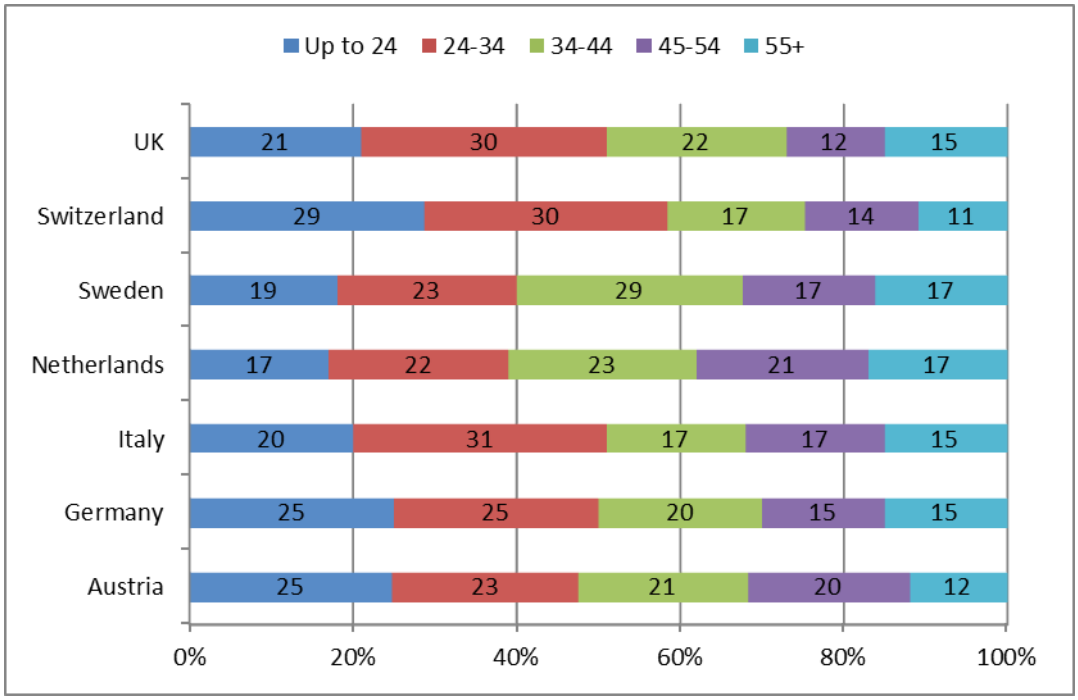
Until 2015, few large scale surveys had been conducted on platform workers in the EU. Much of what was known about the demographics and characteristics of platform workers originated from U.S. based research which pointed to a few commonalities, such as that platform workers were more likely to be young, better educated and more urban than the general population (European Commission, 2016a). As of early 2018, more surveys and studies have been conducted globally and within the EU. The picture that emerges of platform workers is one of greater diversity in age, background, education, personal situation, employment status and motivation for participation in platform work activities.

Age

In the U.S., a randomised anonymised sample of 1 million account holders of the Chase bank identified over 260,000 people who had received income at least once over the course of 36 months (October 2012 to September 2015) from offering goods or services on one of 30 distinct platforms (Farrell and Greig, 2016, p. 3). The study distinguished between platform workers and those active on capital platforms and found that in both cases, participants were 'significantly younger' than the general population (Farrell and Greig, 2016, p. 22). Similarly, a Pew Center survey in December 2014 found that the median age of approximately 380 platform workers was 32 years. In the general U.S. population, 12% of 18 to 29-year-olds had earned money doing online tasks, while the share was 4% for U.S. citizens aged 30 to 49 and only 1% for those over 50 (Smith, 2017).

Huws et al (2017) indicate that young people are overrepresented among platform workers compared with the general population in their respective countries. In Switzerland, 59% of platform workers were younger than 35 years, compared with 57% in Sweden, 51% in Germany and in Italy, 50% in the UK, 47% in Austria and 42% in the Netherlands. However, older workers (55 and over) account for a sizeable portion of platform workers (11% - 17%). Researchers noted that 'the extent to which older age groups are actively participating in a form of work that has only appeared in the last decade, is overturning stereotypes that crowdwork is a phenomenon only affecting the young' (Huws et al, 2016, p. 37).

Figure 5: Age distribution of platform workers across selected EU and EEA countries, 2016



Source: Huws et al 2017, p. 30. Total number of platform workers per country: Austria (388), Germany (281), Italy (494), Netherlands (189), Sweden (189), Switzerland (361), UK (209). Huws et al (2017) weighted the analysis, removed missing values and don't knows. Percentages are rounded off.

For a comparison of results of two other surveys in the UK, according to the CIPD (2017, p. 53), approximately 69% of 417 platform workers were below the age of 40. In the wider sample of workers (N=2,292), the proportion of under 40-year-olds was 44%, which confirms a similar overrepresentation of young people among platform workers.

In 2017, the Employment Relations Survey Centre (FAOS) of the University of Copenhagen commissioned a module on the platform economy in the Danish Labour Force Survey, which found that 38% of approximately 1,800 platform workers in Denmark were below the age of 30 (Ilsøe & Madsen, 2017).

Micro tasks

Berg's (2016) online survey of 353 globally based workers on the micro task platform Crowdflower reported that workers were on average 34.3 years old. Similarly for Amazon Mechanical Turk, the study reported that Indian nationals (N=128) were on average 31.9 years old, compared with 35.5 years for U.S. workers (N=686). Another survey of AMT workers by Brawley and Pury (2016) reported that the average age of 225 U.S. workers was 32.5 years old, compared with 31.6 years old for 132 Indian workers.

Ipeirotis' (2010), online live MTurk Tracker indicates that for any given day in the month of February 2018, between 59% and 75% of globally-based platform workers were younger than 40.

An online survey conducted by IPOL (2017) of 1,200 globally-based platform workers (equally distributed) across four micro tasking platforms, namely AMT, Clickworker, CrowdFlower and Microworkers, reported that about 60% of workers were younger than 40.

Locally delivered tasks

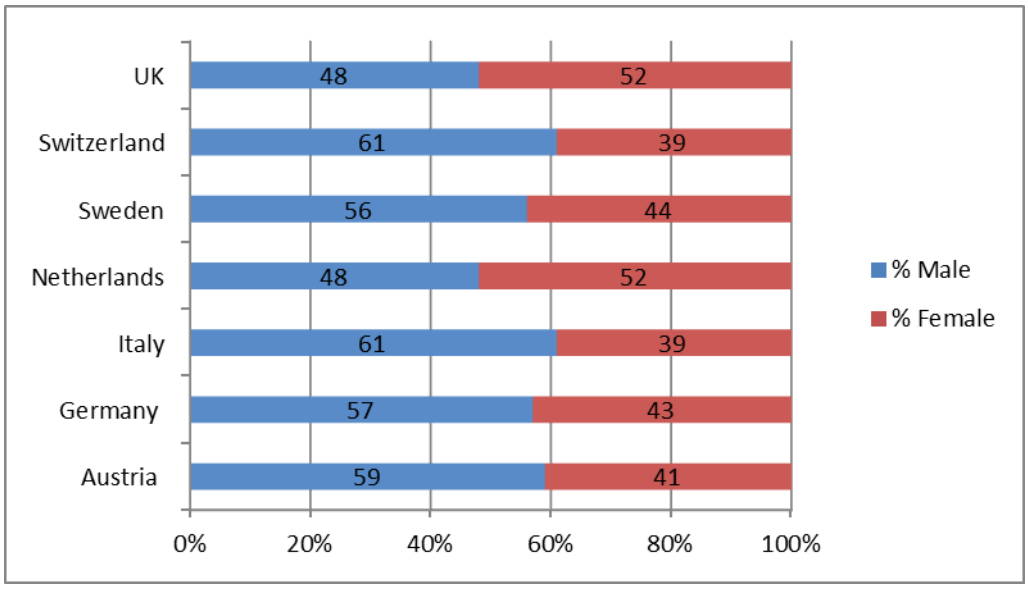
A study in Belgium on the local service provider platform Listminut was conducted through crawling and tracking activities of 14,113 registered workers on the platform over the course of two years. It found that 69% were younger than 30 (De Groen et al, 2016, p. 9).

Gender

Previous research has found smaller and larger differences in gender participation rates across platforms. There appears to be a link between gender and whether the activity is considered to provide the main source or a supplementary form of income (Ipeirotis, 2010). For example, in countries where platform work more often constitutes the main source of income, there is a correlation with the majority of workers being male. In other countries, where platform work is predominantly a supplementary form of income, the share of female workers is much higher, which 'may reflect cultural attitudes and preconceptions about the societal role of women' (Kuek et al, 2015, p. 31).

The figure below shows a female participation rate across countries that range from 39%, to 52% of all platform workers. For the UK, Huws et al's (2017) sample contained 209 UK platform workers, of which 48% were male and 52% female. In comparison, the CIPD (2017) reported a gender profile of UK platform workers (N=417) that was composed of 44% female. The BEIS NatCen Panel of 2,185 UK adults found a gender profile for gig economy workers[4] of 54% male and 46% female, compared with a general population of 49% men and 51% women (BEIS, 2018a, p. 12).

Figure 6: Share of platform workers in selected EU and EEA countries, by gender, 2016



Source: Huws et al, 2017, p. 27. The number of surveyed platform workers per country: Austria (388), Germany (281), Italy (494), Netherlands (189), Sweden (189), Switzerland (361), UK (209).

[4] BEIS defines the gig economy as involving 'exchange of labour for money between individuals or companies via digital platforms that actively facilitate matching between providers and customers, on a short-term and payment by task basis'. This definition excludes agency work, matching services such as LinkedIn, online retail such as eBay and or rental accommodation such as Airbnb.

Online tasks

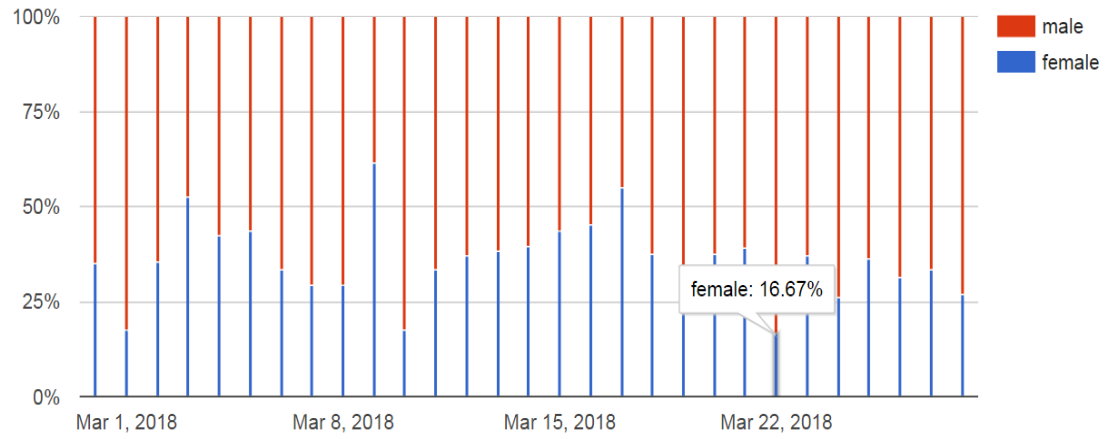
Both on micro task platforms and freelance marketplaces, there appear to be more male than female workers. For the global freelancing platform Upwork (then Elance) in 2012, the gender profile of workers was 58% male (Kuek et al, 2015, p. 31).

In 2014, on the micro task platform CrowdFlower, which lets clients access an online workforce who cleans, labels and enriches data, 72% of workers were male (Kuek et al, 2015). Another survey of CrowdFlower workers in 2015 also found a gender profile of 73% male and 27% female. Similarly, an online survey of 1,200 platform workers across four micro tasking platforms in 2016 reported that, with 61%, males composed a majority of respondents (DG IPOL, 2017).

Two surveys of workers on the micro task platform AMT in 2015 (Berg, 2016; Brawley and Pury, 2016) reported independently of each other that approximately 52% of 225 U.S. workers were male and 48% female, whereas approximately 68% of 132 Indian workers were male and 32% female.

MTurk tracker has shown that the gender participation rate on Amazon Mechanical Turk differs per day. The figure below shows that on 22 March 2018, 14% of Indian workers were female, whereas on 9 March 2018, 62% were women.

Figure 7: MTurk tracker, participation of Indian male and female workers per day, 1 March 2018 to 28 March 2018



Source: MTurk tracker by Ipeirotis, 2010. http://demographics.mturk-tracker.com/#/gender/in (Last accessed 28 March 2018)

Locally delivered tasks

As for personal transport services, Hall and Krueger (2015) reported that nearly 14% of U.S. Uber drivers are female, compared with 8% in the sector of taxi drivers and chauffeurs. In 2015, the online business magazine Forbes reported that similar platform services SideCar[5] had 40% female drivers and Lyft had 30% (Huet, 2015).

A study published by Uber Technologies Inc. in January 2018 looked at granular earnings- and behavioural data of nearly 1.9 million U.S. Uber drivers, active between January 2015

[5] The San Francisco-based early personal transport company SideCar LLC closed on 31 December 2015 due to competition in the market and ongoing legal battles in the U.S. cities where it was operational. https://www.bizjournals.com/austin/blog/techflash/2015/12/early-ride-hailing-service-to-shut-down-this-week.html

and March 2017. About 513,400 drivers were female, accounting for 27.3% of all U.S. Uber drivers[6] (Cook et al, 2018, p. 9).

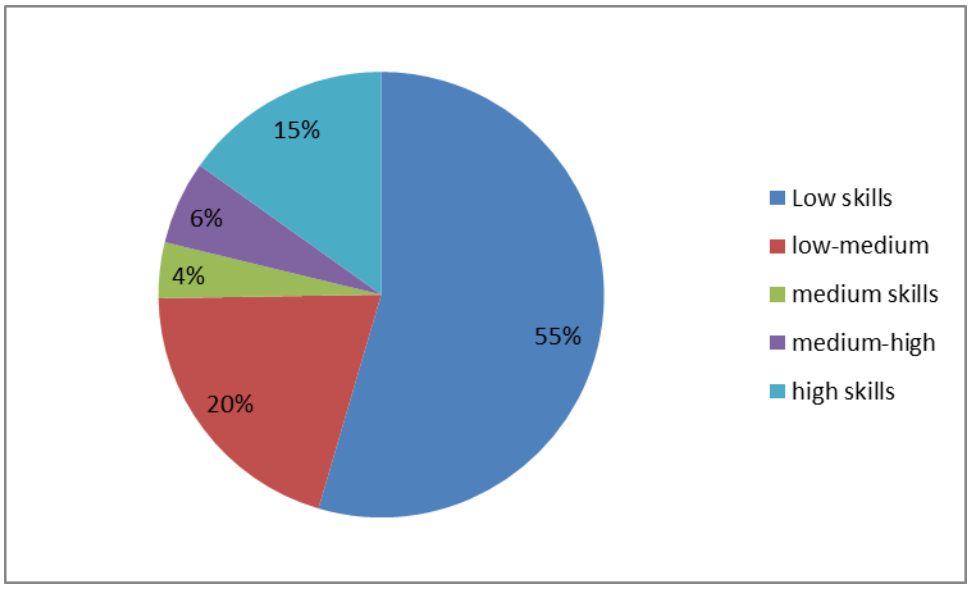
In 2016 in Norway, 13% of 1,298 Uber drivers were female (Alsos et al, 2017).

Further, data on participants of the Belgian local platform Listminut show a gender balance of registered workers in 2015 as 49.4% of over 14,000 users were male and 50.6% was female (De Groen et al, 2016, p. 5).

Skills of platform workers

Scaling skills from low to high, the JRC found for 200 platforms operational in the EU28 that 54% of platforms required low skills, 20% low to medium skills, 4% medium skills, 6% medium to high skills. A further 16% of platforms required high skills (Fabo et al, 2017, p. 15).

Figure 8: Skills requirements across 200 platforms in the EU28, 2017



Source: Fabo et al, 2017, p. 15.

BEIS (2018b, p. 73) interviewed 150 UK platform workers who indicated that the skills required of them in their work could be divided into three broad categories:

- Specific professional and vocational skills;
- ICT literacy that is required to access work for all respondents, and more developed ICT skills for certain tasks;
- Wider employability skills such as English, financial literacy, self-motivation, organisational and interpersonal skills.

For locally delivered services, platform workers mentioned the importance of a given skillset to perform well and give them an edge over competitors. For example, drivers for a personal transport platform who had previous experience as a taxi driver considered this to be advantageous.

People in low skilled manual work considered their practical experience and craft based skills to be important to access work on offer for repairs, maintenance and other work.

[6] This included only peer-to-peer services, such as UberX and UberPOOL, but excludes UberXL, UberBLACK and UberEATS

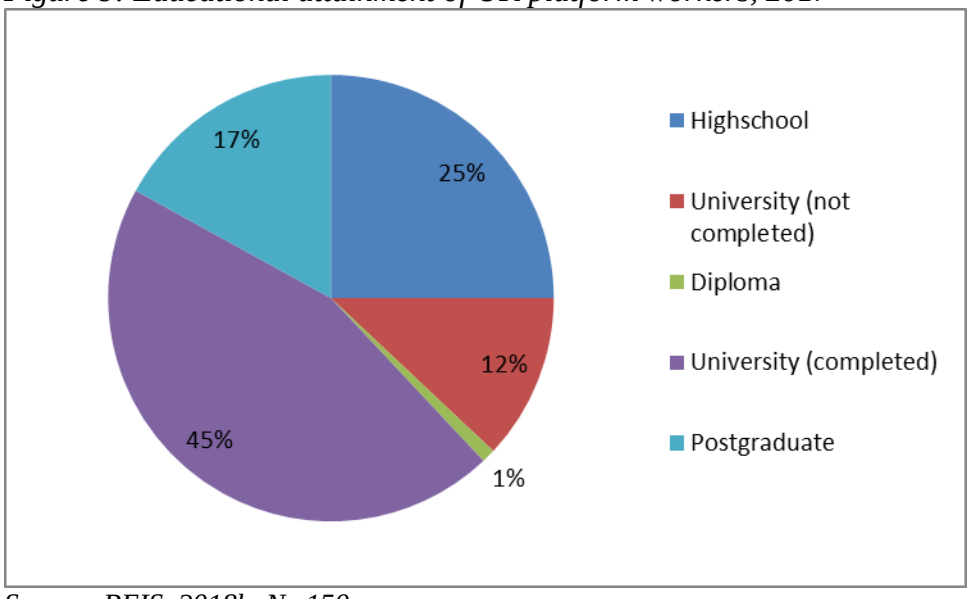
Further, for pet care and handling, experience was useful and desirable, but not required per se to access work. Platform workers performing office and administrative tasks indicated they were required to have a diverse portfolio of skills and knowledge to gain access to a wide variety of tasks.

Platform workers in professional, creative and high skilled tasks reported most often that they were required to have specialised skills and additionally cited broader generic project management skills as a requirement.

Educational attainment

The European Parliament reported that individuals who participated in the work related platform economy in the EU were more likely than average to have degree-level qualifications. This pattern is particularly noticeable for online work and holds less for locally delivered services, where the educational attainment of participants is closer to that of the average population (European Parliament, 2017, p. 43). This finding was also confirmed by the UK Department of Business, Energy, and Industrial Strategy (BEIS, 2018b), stating that respondents who had as their highest qualification a high school diploma, or equivalent to a preparatory pre-university GCE Level 3/A level qualification, were more likely to work in the locally delivered low-skilled, administration, and taxi and courier categories than respondents with higher levels of educational attainment (BEIS, 2018b, p. 20). Alternatively, the CIPD found a small difference in the levels of educational attainment between UK gig workers and the general population, as a smaller proportion of platform workers had either a first degree or a higher degree, such as a PhD (42%), compared with 46% in the wider sample (CIPD, 2017, p. 53).

Figure 9: Educational attainment of UK platform workers, 2017



Source: BEIS, 2018b, N=150.

In Denmark, Ilsøe and Madsen (2017, p. 43) found that 65% of the 1,800 platform workers had upper secondary education or higher education and an additional 24% had completed a third-level degree or PhD. About 11% had only a primary-level degree as their highest educational attainment. The relatively low educational attainment appears largely due to the overrepresentation of young people among platform workers within the sample.

Micro tasking platforms

DG IPOL's (2017) survey of 1,200 platform workers across four micro tasking platforms found that more than 50% of the sample was composed of individuals who held a third-level

degree (both first and second stages of tertiary education), and 23.8% were currently in pursuit of a degree. Further, DG IPOL indicates an undefined 'few workers' who completed only upper secondary education, which demonstrates 'a distinct polarisation within the platform economy' (DG IPOL, 2017, p. 44).

When comparing Brawley and Pury's (2016) and Berg's (2016) surveys of Indian and U.S. AMT workers, findings are very similar and showed that over 90% of Indian workers had a tertiary-level degree as their highest educational attainment, compared with 45% of U.S. workers.

Table 6: Highest level of education attainment of platform workers, in %

	U.S. AMT (N =686) (Berg, 2016)	U.S. AMT (N = 225) (Brawley and Pury, 2016)	India AMT (N = 128) (Berg, 2016)	India AMT (N = 135) (Brawley and Pury, 2016)	Global CrowdFlower (N = 363) (Berg, 2016)
High school/GED	14.3	11	0.8	2	18.7
Some college	37.3	42	2.3	5	20.7
Tertiary (bachelors and masters)	45.2	45	90.7	93	56.6

Source: Berg, 2016, p. 5and Brawley and Pury, 2016, p. 536.

Online professional tasks

Kuek et al (2015) found a difference in education between online tasks through the platform Elance (now Upwork) and that of AMT and CrowdFlower workers. The study reports that 75% of online professionals had a university degree, compared with 33% of micro task workers (Kuek et al, 2015, p. 3).

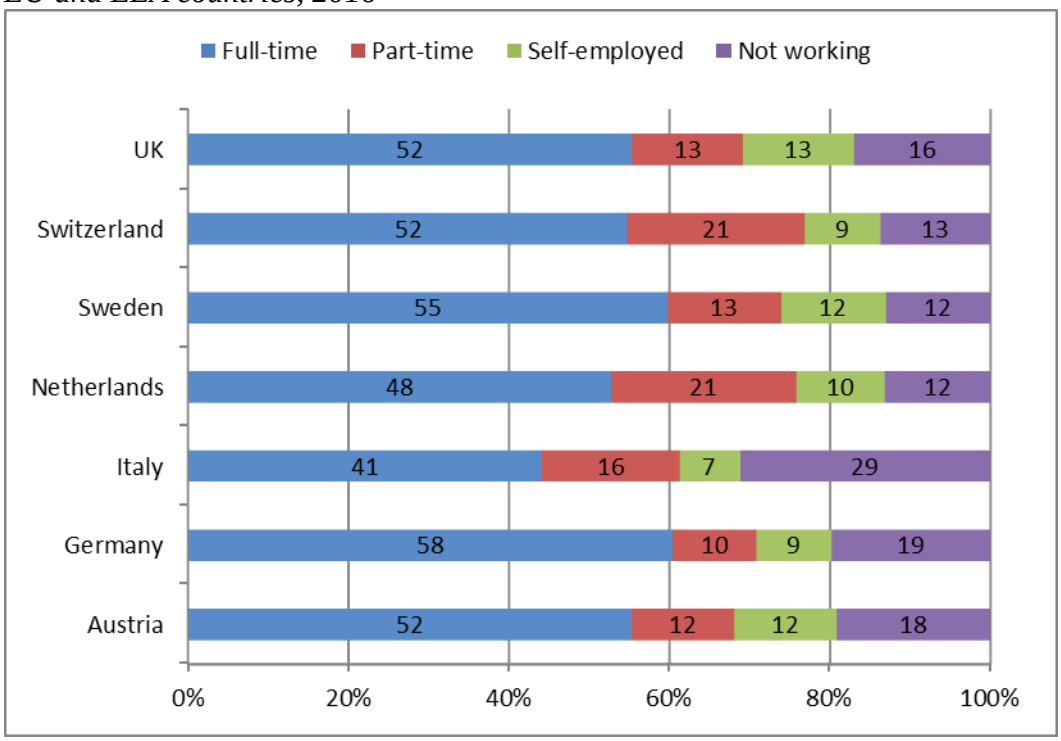
Employment situation

Platform workers often hold at least one other job beside their platform work activities. In the U.S., a survey of over 4,000 people in December 2014 found that 44% of platform workers were in full-time employment besides platform work (Smith, 2017). Farrell and Greig's (2016, p. 6) identification of a pool of platform workers within a large sample of Chase account holders showed that on average about 69% of the platform workers were traditionally employed. They appeared to use the earnings they generated on work related platforms to offset dips in their non-platform derived income and there were indications that workers relied on work related platform earnings when they were between jobs.

Huws et al (2017) found that more than 50% of all platform workers in the surveyed seven countries were in full-time employment besides platform work, except for Italy (41%) and the Netherlands (48%). For people who derived over half of their income from platform work, the share of full-time employment was even higher (ranging from 43% to 63% across countries). In general, platform workers in these seven countries as well as in Denmark were more likely than the average population to indicate they had more than one job or that they had temporary contracts (Huws et al, 2017, p. 10; Ilsøe and Madsen, 2017). In most of the seven countries, the share of platform workers who are not working generally comprises between 12% and

19% of all platform workers, with the exception of Italy at 29%. The not-working category comprises retirees, students and people who are full-time parents or carers (Huws et al, 2017).

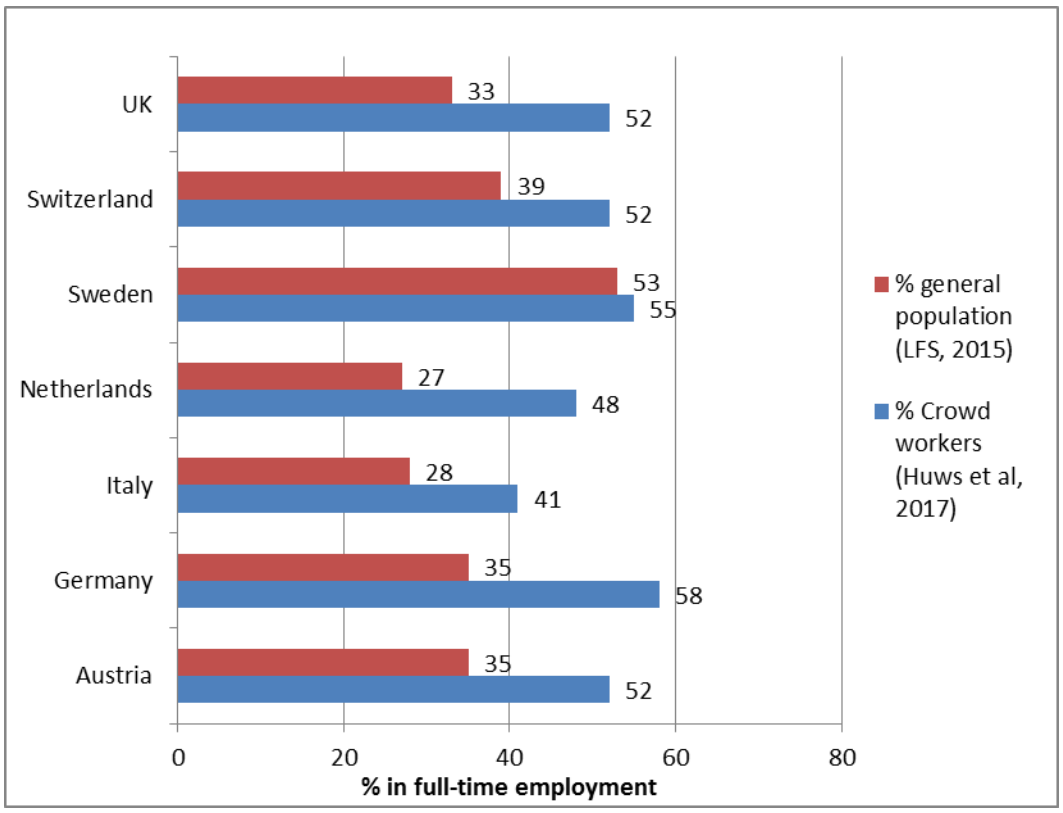
Figure 10: Platform workers' employment situation besides platform work in selected EU and EEA countries, 2016



Source: Huws et al, 2017. The number of platform workers per country: Austria (388), Germany (281), Italy (494), Netherlands (189), Sweden (189), Switzerland (361), UK (209). Missing values and survey responses indicating 'don't know' were removed from the analysis. Percentages were rounded off.

Platform workers in all countries except Sweden were more likely to say they were in full-time employment than the general population. Differences between platform workers and the general population in regards to self-employment were smaller.

Figure 11: Share of platform workers and general population in full-time employment, selected EU and EEA countries, 2015 and 2017



Source: Huws et al, 2017. The number of platform workers per country: Austria (388), Germany (281), Italy (494), Netherlands (189), Sweden (189), Switzerland (361), UK (209). Analysis was weighted, missing values and survey responses indicating 'don't know' were removed. Percentages were rounded off.

In Denmark, in 2015, 47% of 1,800 platform workers were in full-time employment besides platform work (Ilsøe and Madsen, 2017). Students made for 36% and unemployed people 9% (Ilsøe and Madsen, 2017). About 1.6% of temporary employees had earned money this way, compared with 0.7% of permanent employees (Ilsøe and Madsen, 2017, p. 43). Many platform workers were found to be new employees or had been employed for less than three years, which appears linked to the overrepresentation of young people among platform workers.

Micro task workers

The DG IPOL survey of 1,200 platform workers across four platforms found that 68% of respondents had at least one other job outside of platform work. Of these, 60% were in full-time employment and nearly half had a permanent contract. Self-employed made up 14% of the share of platform workers who had an additional job besides platform work (p. 48). Notably, more than half of the sample indicated they had been unemployed for at least some duration in the past five years and 22% of survey respondents indicated they had been unemployed for over 12 months (DG IPOL, 2017, p. 56). DG IPOL points out that around 1.8% of the working population in OECD countries is classified as long-term unemployed, which suggests that the platform workers (with 22%) in the sample were substantially more likely to have experienced long term unemployment than the working population (p. 57).

Platform work as a main or additional source of income

In line with the findings across different surveys and different countries that platform work is not the main job for the majority of platform workers, most platform workers have diversified

sources of income (Huws et al, 2017; DG IPOL, 2017; Ilsøe and Madsen, 2017; Smith, 2017). The U.S. Pew Research Center survey of 4,579 people found that 29% of approximately 420 platform workers identified in the sample indicated their platform work earnings were 'essential to meet basic needs'. An additional 27% indicated these earnings constituted an 'important part of their overall budget' (Smith, 2017).

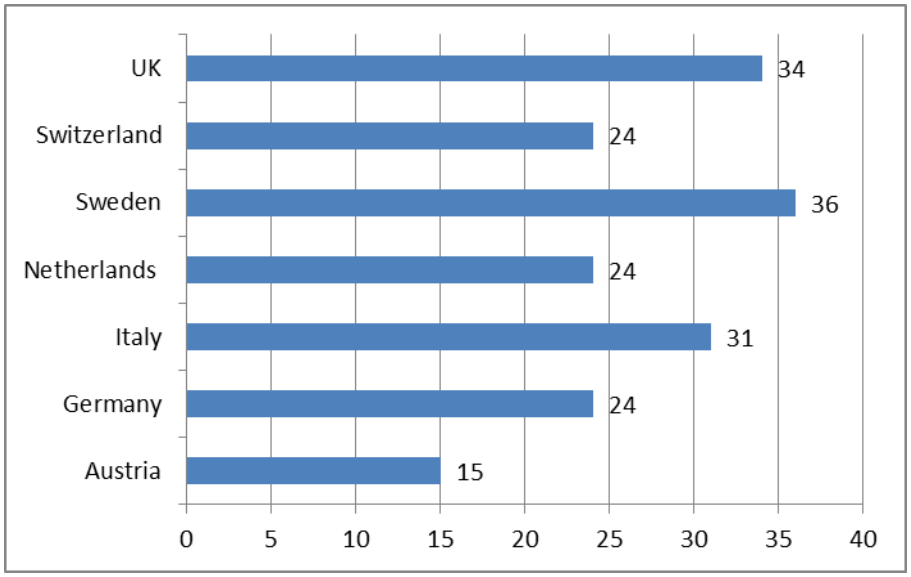
A three-year study of U.S. Chase accountholders found that in the months where platform workers were actively working through platforms (40% estimated active in a given month), their earnings represented a 'sizeable but still secondary source of income' (Farrell and Greig, 2016, p. 24). In active months, the average monthly platform derived income came to $533 (about €433), which represented 33% of total monthly income. The study notes that over three years, among all people who did platform work, 82% relied on platform earnings for less than 25% of their income. As of September 2015, platform earnings represented more than 75% for approximately 10% of all platform workers (Farrell and Greig, 2016, p. 24).

Interestingly, whereas Huws et al (2017, p. 10) find that platform workers across the seven surveyed countries were more likely than the average population to derive income from sources such as selling goods or renting out rooms online, the Danish LFS found that although Danish platform workers often held other jobs in addition to their labour platform based activities, their profiles did not often overlap with those of people who rented out or sold goods online. The reason suggested for this is that platform workers more often lacked the capital and assets to use in this way (Ilsøe and Madsen, 2017).

Similar findings for DG IPOL (2017) and BEIS (2018b, p. 27) indicate that those for whom platform work was their main income or for whom it was a necessity to cover the cost of living, struggled to pay rent and bills and were either in full-time employment that did not pay enough to cover expenses, or in temporary employment or on zero-hour contracts which necessitated topping up dips in income with platform work.

Huws et al's (2017) survey shows that in Austria, approximately 15% of platform workers derived more than 50% of their income from platform working. Conversely, in Sweden, 36% of 189 platform workers indicated the same.

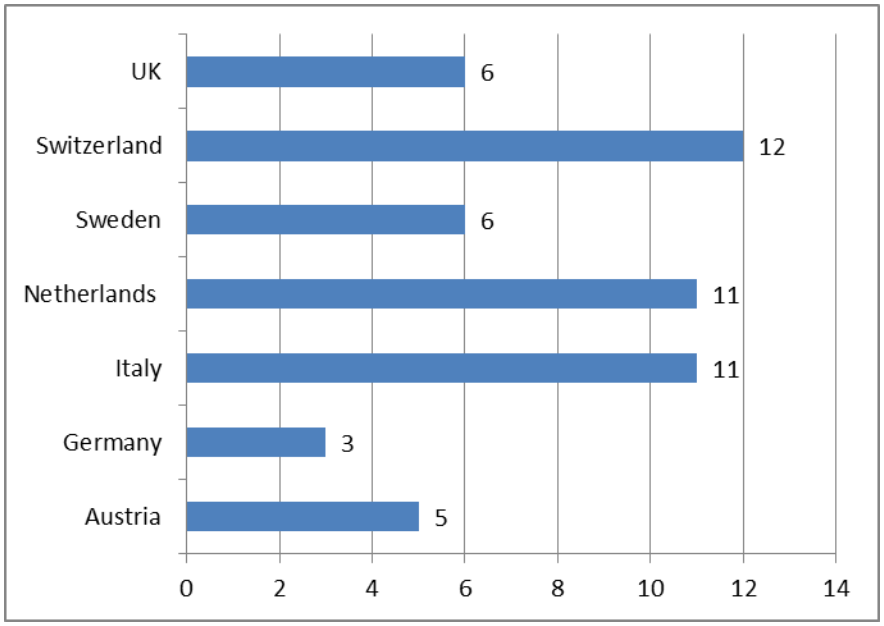
Figure 12: Share of platform workers deriving more than 50% of personal income from platform work activities, selected EU and EEA countries, 2016



Source: Huws et al, 2017, p. 21. Respondents who said they had ever carried out platform work (weighted and missing values and don't knows excluded). Austria (388), Germany (281), Italy (494), Netherlands (189), Sweden (189), Switzerland (361), UK (209).

Further, reliance on platform work earnings varies much across countries. For example, whereas in Germany only 3% of platform workers indicate that these earnings compose their main source of income, in Switzerland this is as high as 12%. These differences may be due to the types of platforms operational in these countries and on whether they are widespread enough that people are able to derive enough income through these platforms to live on.

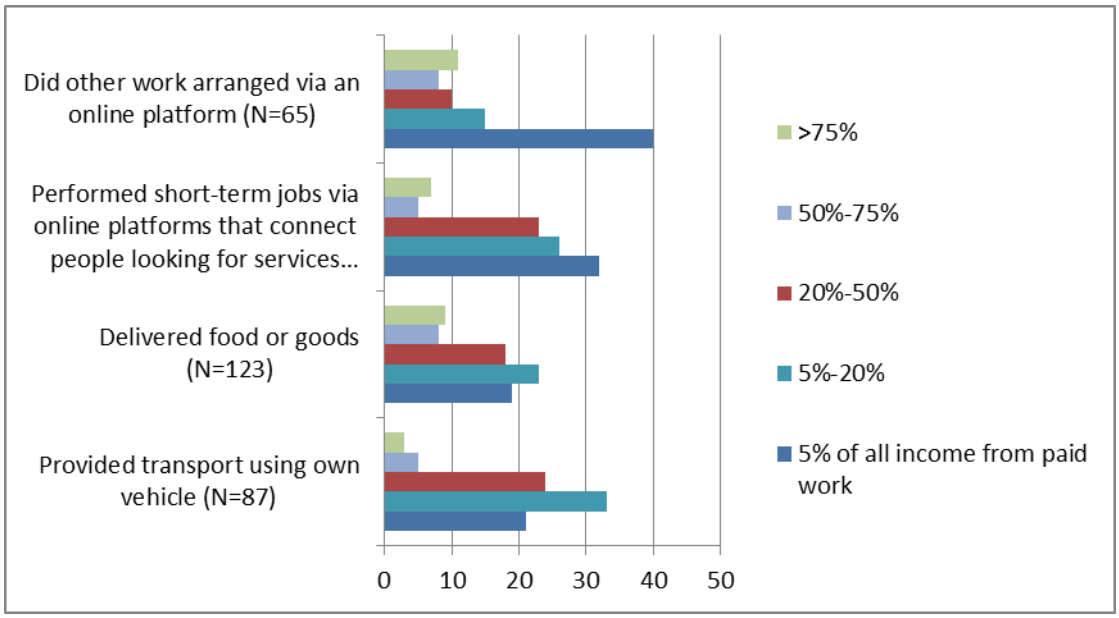
Figure 13: Share of platform workers who relied on platform work earnings for more than 75% of their personal income, selected EU and EEA countries, 2016



Source: Huws et al, 2017, p. 21. Respondents who said they had ever carried out platform work (weighted and missing values and don't knows excluded). Austria (388), Germany (281), Italy (494), Netherlands (189), Sweden (189), Switzerland (361), UK (209).

To compare findings for the UK, Huws et al (2017) note that approximately 6% of the platform workers depend on platform work earnings for more than 75% of all personal income. The CIPD (2017) examines platform work earnings as a proportion of all income derived from paid work. The distinction between 'personal income' and 'derived from paid work' is an important one, as personal income also includes benefits and transfers as well as family support, whereas income derived from paid work does not. CIPD data show that there are different shares of platform work earnings' dependence across different platform activities. For example, 9% of platform workers in foods and good delivery derive more than 75% of all income from paid work, compared with only 3% of platform workers in transportation tasks.

Figure 14: Share of UK platform workers' total income earned from different types of gig economy activities over the past 12 months, 2016



Source: CIPD, 2017.

Online professional tasks

In 2012, Upwork noted that nearly half of its workers reported that their online earnings constituted their sole source of income (Kuek et al, 2015, p. 34).

Micro tasks

Berg's (2016) survey of AMT workers found that 37% of 686 U.S. AMT workers held AMT as main source of income. Of the 128 surveyed Indian workers, 49% relied on platform work as their main source of income (Berg, 2016, p. 9)

Brawley and Pury (2016) arrived at similar findings. Amongst the 225 U.S. workers surveyed, 39% held platform work as their main source of income, compared with 41 % of 132 Indians.

DG IPOL's survey (2017) found that workers deriving over 70% of their income from platform work accounted for 25% of 1,200 respondents (DG IPOL, 2017, p. 61).

Locally delivered tasks

Hall and Krueger (2015) found that for about 24% of 600 Uber drivers, earnings through Uber constituted their only source of personal income. For 16%, Uber was the largest but not the only source of income, and 38% of drivers used Uber derived income as a supplement to other income and not as a significant source.

Personal income

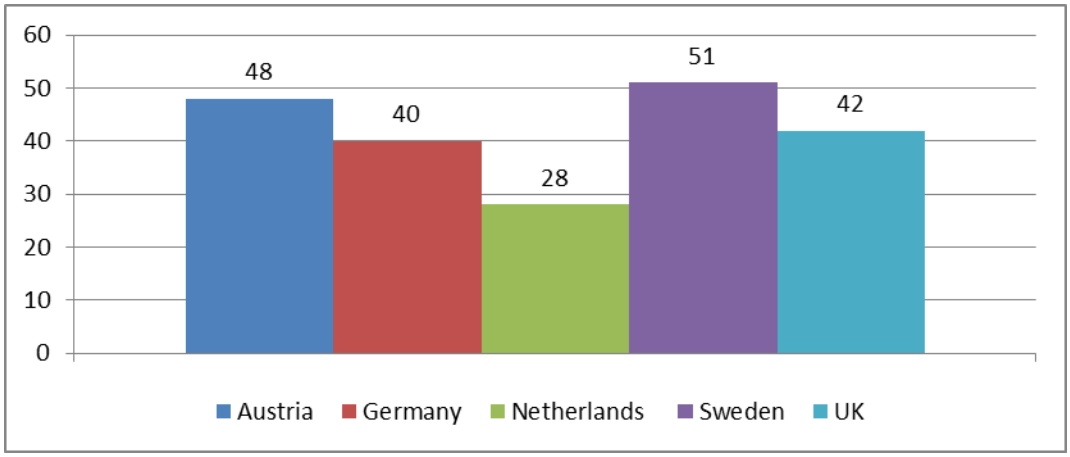
The Pew Research Center survey of over 4,500 Americans found that lower income Americans (annual incomes less than $30,000 (€24,000)) were twice as likely to do platform work than those with households earning over $75,000 (€61,000) (Smith, 2016). The study does not clarify clear whether they have lower incomes because they are platform workers, or whether they are platform workers because they have low income and want to have additional earnings.

In European countries, there appears to be a similar pattern in income distribution. For example, the Danish Labour Force Survey found that 32% of all platform workers in Denmark were located in the two bottom income segments. These lower than average

incomes may have been skewed somewhat due to the overrepresentation of young people in the sample (Ilsøe and Madsen, 2017).

Huws et al (2016) provide information on the personal income of platform workers for five of the seven surveyed countries, namely Austria, Germany, the Netherlands, Sweden and the UK.

Figure 15: Share of platform workers in lower income bracket, selected EU countries, 2016



Source: Huws et al, 2016, pp. 46-47. The lower income bracket was set at less than €18,000 for Austria, Germany and the Netherlands, less than 299,999KR (about €29,500) in Sweden and less than £19,999 (€22,500) in the UK.

The second income bracket was set at €18,000-36,000 in Austria (43%), Germany (46%) and the Netherlands (28%). In the UK, 30% of the platform workers earned a personal income between £20,000 and £34,999 (€22,500-39,500) annually. In Sweden, 33% of platform workers earned between 300,000 and 499,999 Swedish Krona (€29,500-49,300).

Platform work was less prevalent among the highest income segment set over €60,000 in Austria (3%), Germany (3%), and the Netherlands (8%). In Sweden, 4% of platform workers indicated they earned more than 700,000KR (€69,000) annually. In the UK, 7% of platform workers indicated they earned more than £55,000 (€62,000).

In its survey of UK gig workers, the CIPD (2017) found that gig workers had less overall financial resilience compared with other workers. About 49% of 417 gig workers indicated they were 'living comfortably' or 'doing alright' compared with 56% of other workers (N=2,292). Also, 20% of gig workers reported they found it 'quite' or 'very difficult' to manage financially, compared with 13% for other workers (CIPD, 2017, p. 16).

Motivation to engage in platform work

BEIS (2018b), CIPD (2017) and Balaram et al (2017) found for workers in the UK that there were common elements in their motivation to participate in platform work, as respondents indicated they:

- Required flexibility for personal reasons (care responsibilities, studies, personal preference to control how to spend the time); this is, for example, mentioned by 53% of the gig economy respondents to the Balaram et al (2017) survey, appreciating the ability to fit gig work around other commitments and viewing the working conditions (including pay) positively;
- Wanted to earn money to supplement personal or household income, as mentioned, for example, by about one third of the Balaram et al (2017) gig economy workers; Many 'frequent' platform workers derive less than 50% of their overall income from

platform work activities (DG IPOL, 2017; Dolvik and Jesnes, 2018; Huws et al, 2017);

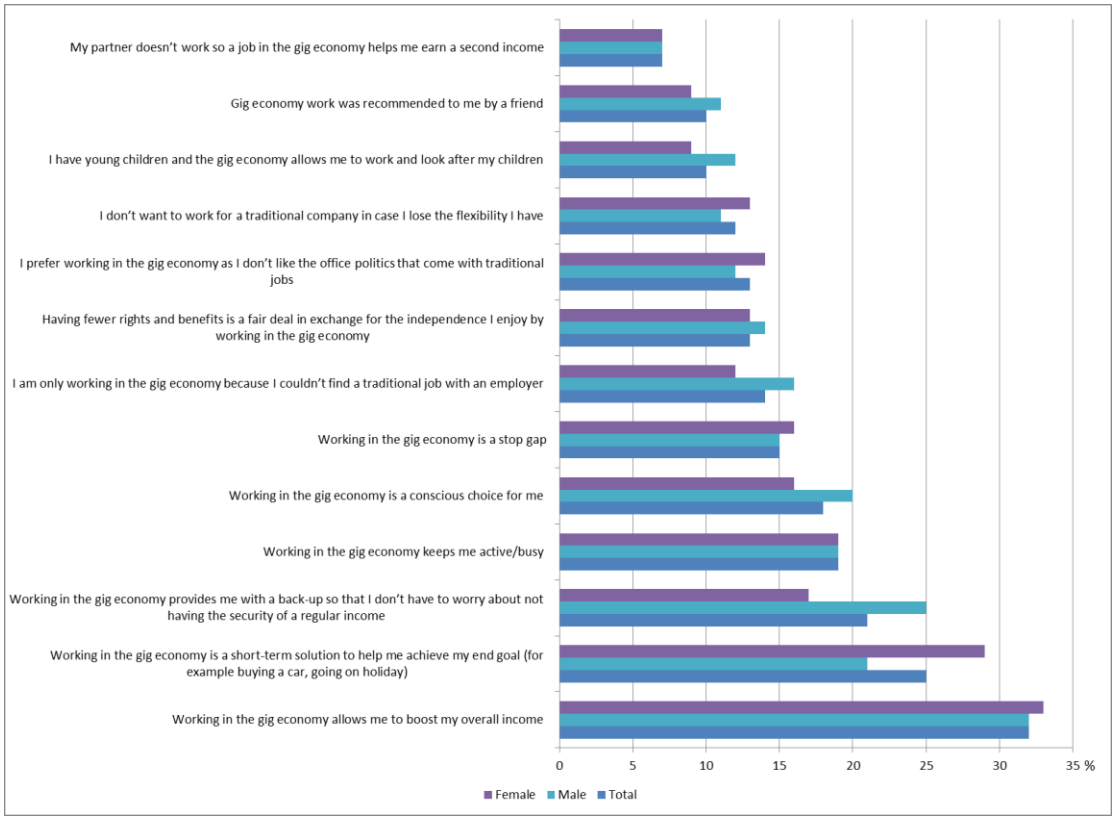
- Wanted or needed to promote themselves as a freelancer in a given occupation (particularly prevalent for high-skilled, creative works);
- Wanted or needed to work through a transitional period after having been 'traditionally' employed;
- Wanted or needed opportunities to gain work experience (in particular relevant for students and new entrants to the labour market).

A small segment of workers with physical and mental health issues cited better working conditions through platform work compared with traditional employment (BEIS, 2018b, p. 20).

For a minority of respondents, working in the gig economy was not a choice, but resulted from them being unable to find employed work, having been made redundant or needing to supplement the income from their main employed job (BEIS, 2018b, p. 24). Similar findings were reported by other authors (Berg, 2016; CIPD, 2017; DG IPOL, 2017; Huws et al, 2017; Ilsøe and Madsen, 2017; Rouse, 2010; Balaram et al, 2017).

CIPD (2017) reports that the most often cited motivation for platform workers to participate in platform work centred around boosting income or earning money for specific goals, such as the acquisition of a car.

Figure 16: Share of UK gig economy workers who agree with the following statements about why they are working in the gig economy, by gender, 2016

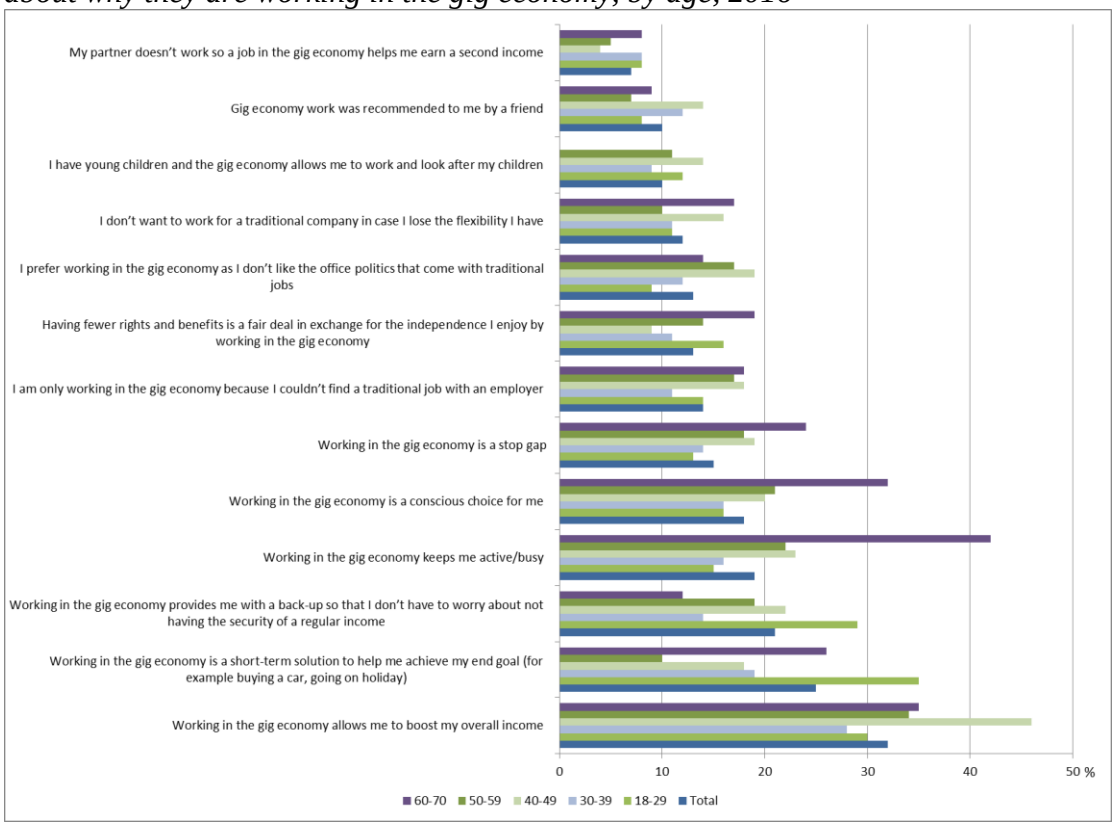


Source: based on CIPD, 2017.

The reasons to engage in platform work can differ per age group. For example, while 42% of 60 to 70 year olds indicate that staying active motivates them to do platform work, only 15% of 18 to 29 year olds give the same reason. The older age group was also much more likely to state that work in the gig economy was a conscious choice for them (32% versus 16%-21% for the other age groups). Interestingly, the age group of 40 to 49 year old was most likely to

say they worked in the gig economy because it allowed them to boost their overall income (46%) (CIPD, 2017).

Figure 17: Share of UK gig economy workers who agree with the following statements about why they are working in the gig economy, by age, 2016



Source: based on CIPD, 2017.

Online professional tasks

For high skill, professional occupations, common motivations centre around locating the kind of work workers were already doing in traditional employment or as a freelancer, to enhance the scope of tasks available to them or to reduce the time spent looking for work via other means (BEIS, 2018b; Rouse, 2010). Also, platform work can be a form of self-advertising for those seeking new job opportunities or hoping to improve their chances in the market (Leimeister et al, 2009; Rouse, 2010). Interviews conducted with platform workers in the UK showed this motivation may be particularly strong for creative workers and artists as gig work aligned with their training and work experience and helped them access work (BEIS, 2018, p. 74).

Other workers may use platforms to try out new kinds of tasks that interest them or to gain experience (Huws, 2014; Huws et al, 2016; Rouse, 2010). Experience appeared a strong motivator for students and young entrants to the labour market (BEIS, 2018b, p. 20), and served people in transition periods.

Some workers are motivated by a desire to enhance their social standing, through gaining the approval of significant others, friends, or a specific audience (Leimeister et al, 2009; Rouse, 2010, p. 5). Surveys found that in particular creative platform workers were motivated by the opportunity to gain recognition from their peers (Brabham, 2010; Geiger et al, 2011).

Online micro tasks

Although micro tasks are generally low paid, studies have shown that even on platforms where remuneration is very low, workers' engagement in platform work is primarily motivated by money (Gewald and Pilz, 2013; Graham et al, 2017; Kaufmann et al, 2011; Silberman and Irani, 2016). Interestingly, Jiang et al's (2015) online survey of 525 Indian and U.S. AMT workers found that workers compartmentalised their AMT remuneration and other forms of remuneration and 'set up different mental accounts to frame the money earned from Mechanical Turk'. As a result, they did not compare earnings derived from platform work with the wage rate in a traditional workplace. The researchers state that ''the seeming underpayment from microwork is more readily comprehended as part of a rational strategy to enhance economic wellbeing through separate mental accountings', for some to top up other income and for others to afford non-essential goods or services (Jiang et al, 2015, p. 778). It is important to note that the AMT earnings could constitute a smaller or larger share of overall income, and the 'different mental account' for AMT earnings should therefore not necessarily be interpreted as 'pocket money' only.

Berg (2016) found that 45% of U.S. AMT workers complementing pay from other jobs was their main reason to do platform work. This reason was less common among CrowdFlower workers (26%). Only 10% of Indian AMT workers indicated they used platform work to supplement other sources of income. Indian AMT workers more commonly indicated they preferred to work from home (31.7%), compared with 19.4% of U.S. AMT workers and 18.4% of CrowdFlower workers.

There appears to be a gendered preference to working from home as a main reason to do platform work. Among U.S. AMT workers, 15.8% of women gave this reason, compared with 4.8% of men. Among Indian AMT workers, 16.2% of women indicated this reason, compared with 7% of men. For CrowdFlower, 6.4% of women gave this reason, compared with 2.8% of men. Many workers cited care responsibilities as a reason for performing platform work. 'Of the workers who stated that they can only work from home (94 in total), 26% have children under the age of six' (Berg, 2016, p. 7).

Locally delivered tasks

Hall and Krueger (2015) commissioned a survey of 601 active Uber drivers which was used in conjunction with anonymised administrative data on Uber drivers' driving histories, schedules and earnings between 2012 and 2014. The most common reasons for partnering with Uber were earning money (91%), to control own schedule (87%), flexibility (85%), and to offset fluctuations in other sources of income (74%). 42% of female Uber drivers cited family, education, or health reasons as a reason they required flexibility in setting their own schedules, compared with 29% of men.

Teodoro et al (2014) conducted semi-structured interviews with 12 workers from a platform that matches supply and demand for locally delivered and manual tasks, TaskRabbit, and a platform that matches local informants to brands and retailers, Gigwalk. Common tasks on Gigwalk include store audits, price checks, customer interviews and field photography. The study found that workers were primarily motivated to do platform work by the prospect of earning money, which held true for workers who experienced financial insecurity as well as for those who considered themselves financially secure. Also, all 12 participants valued the personal control platform work afforded over their schedules, over the tasks they accepted, and negotiation of their own rates.

Box 4. Motivation of clients

For small and large businesses, employing staff is expensive (Aloisi, 2015; Codagnone et al, 2016a; Felstiner, 2011). Using platform workers can help companies access a broad range of skills at short notice and at lower cost than through an agency or through company

recruitment, and therefore has lower marginal and transaction costs. Critical literature has pointed out that using platform workers (as independent contractors) primarily offers companies a comparative advantage over those that pay tax, insurance and social contribution on their employees (Corporaal and Lehdonvirta, 2017). Such is not specific to platform work, but rather fits into broader trends of the increasing precariousness of working life (ILO, 2016a).

Beyond financial motives, there are alternative motivations that depend on who the clients are. For example, clients on AMT can be distinguished into three main types:

- Academics;
- Start-ups, and small businesses; and
- Large corporations (Bergvall-Kåreborn and Howcroft, 2014; Eurofound, 2015).

Academics are known as infrequent users who use the platform because it can provide them with quick results on surveys, experiments or language processing tasks (Bergvall-Kåreborn and Howcroft, 2014, p. 219). The U.S. think tank Pew Research Center claimed that in 2015 alone, more than 800 published academic articles were based on results gathered through AMT (Hitlin, 2016). Additionally, non-profit research institutions competing with corporations and consultancies are interested in using platform work as an alternative to conventional labour to compensate for resource insufficiencies.

Similarly, start-up clients are generally small-sized firms that may be attracted to platform work because it makes modest demands on (often scarce) resources. In the start-up community, platform work is advertised as cheap, flexible and without any strings attached (Boudreau and Lakhani, 2013).

Lastly, large corporations are attracted to platform work for the cheap labour and the workflow management options that it provides (Bergvall-Kåreborn and Howcroft, 2014). For example, National Geographic used 28,000 workers to try to identify Genghis Khan's tomb in satellite images (Bourdeau and Lakhani, 2013), which would have been more difficult achieve with conventionally hired labour under the same budget restrictions.

In short: Main findings from literature on platform workers' characteristics

A comparatively high number of studies has explored the main characteristics of platform workers; however, findings referring to Europe are rather limited.

In general, research highlights that platform workers are rather young (mainly below 30). Most studies show a higher share of male than of female platform workers.

The educational level of platform workers is not extensively covered in extant research, and the available studies come to quite different results. A common finding is that tasks delivered online are realised by higher skilled workers. As regards the scale of tasks, some studies flag lower qualifications for micro taskers while others find a high share of platform workers with tertiary education conducting such assignments. Interesting in this context is the direct comparison of Indian and U.S. workers on the same platforms, showing considerably higher educational attainments of Indian platform workers.

Around 70%-80% of platform workers have a 'traditional' job next to their platform work. From those studies providing more detailed information it can be concluded that about 40%-60% of platform workers have a full-time employment relationship, and about 10%-15% are self-employed in the traditional economy. In line with that, several studies point towards the fact that platform work is not the sole income source for platform workers.

Several studies have also explored the motivations of platform workers to engage in this employment form. Overall, it can be considered that a mix of push and pull factors attracts workers to platform work. The most prominent push factors are the need (or wish) to earn (additional) income (in line with some findings that platform workers tend to have low

personal income) as well as labour market access. Pull factors mainly refer to the opportunity to gain experience, build up reputation and try out new tasks (mainly referring to professional online tasks) and the flexibility platform work offers, including the discretion to select tasks, control one's work schedule and work from home.

Table 7: Summary of the main literature on platform workers' characteristics

Source	Geographic scope	Age	Gender	Education	Employment situation	Income situation	Motivation
Alsos et al, 2017	NO	n.a.	87% of Uber drivers are male	n.a.	n.a.	n.a.	n.a.
Balaram et al, 2017	UK	n.a.	n.a.	n.a.	n.a.	n.a.	Flexibility To earn additional income Labour market access
Beis, 2018b	UK	n.a.	54% of gig workers are male, 46% female	Platform workers with high school diploma or pre-university qualification are more likely to work in low-skilled, administration, taxi and courier tasks	n.a.	n.a.	Flexibility To earn additional income To gain experience and build up reputation Labour market access To increase efficiency of job search (online professional tasks)
Berg, 2016	World	Average age of micro taskers: 34.3 years	n.a.	n.a.	n.a.	n.a.	To earn additional income Labour market access
	India	Average age of	68% of platform	1% of micro taskers		n.a.	

		micro taskers: 31.9 years	workers providing online services are male	have a high-school degree, 2% some college, 91% tertiary education			To work from home
	U.S.	Average age of micro taskers: 35.5 years	52% of platform workers providing online services are male	14% of micro taskers have a high-school degree, 37% some college, 45% tertiary education		37% of micro taskers have platform work as main income source	
Brabham, 2010	World	n.a.	n.a.	n.a.	n.a.	n.a.	To build up reputation (online professional tasks)
Brawley and Pury, 2016	India	Average age of micro taskers: 31.6 years	68% of platform workers providing online services are male	2% of micro taskers have a high-school degree, 5% some college, 93% tertiary education	n.a.	41% of micro taskers have platform work as main income source	n.a.
	U.S.	Average age of micro taskers: 32.5 years	52% of platform workers providing online services are male	11% of micro taskers have a high-school degree, 42% some college, 45% tertiary education		39% of micro taskers have platform work as main income source	
CIPD, 2017	UK	69% of platform workers are younger than 40	56% of platform workers are male, 44% female	Lower qualification than the overall population	n.a.	Low financial resilience of platform workers	Labour market access To earn additional

							income Autonomy Flexibility
Cook et al, 2018	U.S.	n.a.	73% of Uber drivers are male	n.a.	n.a.	n.a.	n.a.
De Groen et al, 2016	BE	69% of registered workers on a platform for locally delivered services are younger than 30 years	49% of registered workers on a platform for locally delivered services are male	n.a.	n.a.	n.a.	n.a.
DG IPOL, 2017	World	60% of micro taskers are younger than 40 years	61%-73% of platform workers providing online services are male	50% of micro taskers have a third-level degree	68% of micro taskers have at least one other job next to platform work; of those, 60% are in full-time employment and nearly half have a permanent contract, 14% are self-employed; half of the platform workers have been unemployed during the past five years, 22% long-term unemployed	Majority of platform workers have income from different sources	To earn additional income Labour market access

European Parliament, 2017	EU28	n.a.	n.a.	Degree, notably for platform workers delivering online tasks	n.a.	n.a.	n.a.
Farrell and Greig, 2016	U.S.	'significantly younger' than the general population (not further specified)	n.a.	n.a.	69% are in traditional employment (next to platform work)	Income from platform work is sizeable, but still secondary Lower income earners more likely to do platform work	n.a.
Gewald and Pilz, 2013	World	n.a.	n.a.	n.a.	n.a.	n.a.	To earn additional income (online micro tasks)
Graham et al, 2017	Sub-Saharan Africa and South-east Asia	n.a.	n.a.	n.a.	n.a.	n.a.	To earn additional income (online micro tasks)
Hall and Krueger, 2015	U.S.	n.a.	86% of Uber drivers are male	n.a.	n.a.	For 24% of the drivers, earnings through Uber is the only income source	Uber drivers: To earn income To control own schedule Flexibility

Huet, 2015	U.S.	n.a.	60% of SideCar and 70% of Lyft drivers are male	n.a.	n.a.	n.a.	n.a.
Huws et al, 2017	AT	25% of platform workers are up to 24 years, 23% 24-34, 21% 34-44, 20% 45-54, 12% 55+	59% of platform workers are male, 41% female	n.a.	52% are in full-time employment, 12% in part-time employment, 12% self-employed, 18% not working beside platform work, more likely than the average population to have more than one job or a temporary contract	Majority of platform workers have income from different sources	To earn additional income Labour market access To try out new tasks (online professional tasks)
	CH	29% of platform workers are up to 24 years, 30% 24-34, 17% 34-44, 14% 45-54, 11% 55+	61% of platform workers are male, 39% female		52% are in full-time employment, 21% in part-time employment, 9% self-employed, 13% not working, more likely than the average population to have more than one job or a temporary contract		
	DE	25% of platform workers are up to	57% of platform workers are male,		58% are in full-time employment, 10%		

		24 years, 25% 24-34, 20% 34-44, 15% 45-54, 15% 55+	43% female		in part-time employment, 9% self-employed, 19% not working (next to platform work), more likely than the average population to have more than one job or a temporary contract		
	IT	20% of platform workers are up to 24 years, 31% 24-34, 17% 34-44, 17% 45-54, 15% 55+	61% of platform workers are male, 39% female		41% are in full-time employment, 16% in part-time employment, 7% self-employed, 29% not working (next to platform work), more likely than the average population to have more than one job or a temporary contract		
	NL	17% of platform workers are up to 24 years, 22% 24-34, 17% 34-44, 17% 45-54, 15% 55+	48% of platform workers are male, 52% female		48% are in full-time employment, 21% in part-time employment, 10% self-employed, 12%		

					not working (next to platform work), more likely than the average population to have more than one job or a temporary contract		
	SE	19% of platform workers are up to 24 years, 23% 24-34, 29% 34-44, 17% 45-54, 17% 55+	56% of platform workers are male, 44% female		55% are in full-time employment, 13% in part-time employment, 12% self-employed, 12% not working (next to platform work), more likely than the average population to have more than one job or a temporary contract		
	UK	21% of platform workers are up to 24 years, 30% 24-34, 22% 34-44, 12% 45-54, 15% 55+	48% of platform workers are male, 52% female		52% are in full-time employment, 32% in part-time employment, 13% self-employed, 16% not working (next to platform work), more likely than		

					the average population to have more than one job or a temporary contract		
Ilsøe and Madsen, 2017	DK	38% of platform workers are younger than 30	n.a.	65% of the 1,800 platform workers had upper secondary education or higher education and an additional 24% had completed a third-level degree or PhD. About 11% had only a primary-level degree.	47% are in full-time employment, 36% are students, 9% are unemployed (next to platform work), more likely than the average population to have more than one job or a temporary contract	Lower income earners more likely to do platform work Majority of platform workers have income from different sources	To earn additional income Labour market access
Ipeirotis, 2010	U.S. and India	59%-75% of micro taskers are younger than 40 years	High variation across days; 38%-86% of Indian platform workers providing online services are male	n.a.	n.a.	n.a.	n.a.
Kaufmann et al, 2011	World	n.a.	n.a.	n.a.	n.a.	n.a.	To earn additional income (online micro tasks)
Kuek et al, 2015	World	n.a.	in countries where platform work	75% of online freelancers and	n.a.	Half of Upwork workers report	n.a.

			rather is the main source of income, the majority of workers are male while where platform work rather for supplementary income, the share of female workers is higher 58%-72% of platform workers providing online services are male	33% of micro workers have an university degree		their online earnings as sole income source (2012)	
Leimeister et al, 2009	DE	n.a.	n.a.	n.a.	n.a.	n.a.	To gain experience and build up reputation (online professional tasks)
Rouse, 2010	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	To earn additional income Labour market access To increase efficiency of job search (online professional tasks)

							To gain experience and build up reputation (online professional tasks) To try out new tasks (online professional tasks)
Silberman and Irani, 2016	World	n.a.	n.a.	n.a.	n.a.	n.a.	To earn additional income (online micro tasks)
Smith, 2017	U.S.	Median age: 32 years 12% of the age group 18-29, 4% of 30-49, 1% of 50+	n.a.	n.a.	44% are in full-time employment (beside platform work)	Lower income earners more likely to do platform work Majority of platform workers have income from different sources, but 56% indicate that income from platform work is essential to them	n.a.
Teodoro et al, 2014	U.S.	n.a.	n.a.	n.a.	n.a.	n.a.	To earn money (locally delivered platform work) to control own schedule

							To decide on the tasks to accept To negotiate own rates

n.a. – no information available

Source: own compilation

Types of platform work

The following section aims to give an overview of different characteristics used by different authors to classify platform work, as well as a brief description of the different forms of platform work based on the individual characteristics. It must be noted that several authors provide a classification based on one or a few elements; and few combine a broader set of criteria. The intention of this paper is to bring the different categorisation options together, as discussed in the final section of this chapter.

Relationship between platform, client and workers

Platforms differ along the lines of who owns and governs their infrastructure.

Some well-known platforms such as Upwork, TaskRabbit or AMT are owned by a company that offers matching services to clients and workers beyond its own workforce. These platforms **address an ex ante undefined crowd of clients and workers**. The added value of such platforms strongly depends on the scale of their network. The more members join (clients and workers), the more valuable the platform becomes as it becomes more interesting for current and future clients and workers due to larger business opportunities (often referred to as network effects).

Alternatively, a platform may be an internal part of an organisation that is not accessible beyond the own staff and which involves 'clients' from within the organisation (such as line managers). Examples of **employer-owned internal platforms** include work flow organising solutions of large car manufacturers, and may include internal communication systems and facilities to organise tasks and store shared data (Accenture, 2016). These are closed systems inaccessible to outsiders, except to those who have been expressly invited into the organisation, such as temporary or remote workers. The crowd is composed of the organisation's employees (Durward et al, 2016) and the platform creates value by enhancing productivity and workflow. For example, in 2008, IBM organised an 'innovation jam', where 150,000 IBM employees and stakeholders were invited to collaborate online to develop innovative ideas. From hundreds of ideas, a handful was picked to develop into businesses and solutions (Bjelland and Wood, 2008). Closely linked to this are employer-owned platforms that outsource tasks to a crowd **outside** the own organisational structures, such as independent contractors. Companies can use both external and internal platforms at the same time (Leimeister et al, 2015).

Platforms with organisation structures that resemble traditional **cooperative organisational structures** have started to emerge. They are 'collectively owned and governed by the workers who depend on, participate in, and derive livelihoods from them' (ILO, 2016a, p. 4; Pazaitis et al, 2017; Scholz, 2017). Cooperatives redistribute a portion of the platform's profits to the workers who create value through their labour and are co-owners of the platform, and a portion of the profits is usually reinvested in the platform for maintenance and growth (Scholz, 2016, 2017). An example is the worker-owned Loconomics platform, which connects demand and supply for locally delivered services in the San Francisco area (U.S.). What appears at first glance to be a commission fee is an 'ownership fee' and the platform claims that the profits generated by Loconomics are returned to the owners, commensurate with their generation of profits. Owners have equal votes in electing the board and may be elected themselves (Loconomics, 2018). Other examples include Cotabo, a transport cooperative in Bologna, Italy; the taxi cooperative Modo in Vancouver, Canada; the Yellow Cab Cooperative in San Francisco, California, U.S., or the Up & Go women-cooperative in New York for house cleaning services and the Union Taxi in Denver (U.S.), with an online ride-hailing system that resembles Uber's (Schneider, 2016).

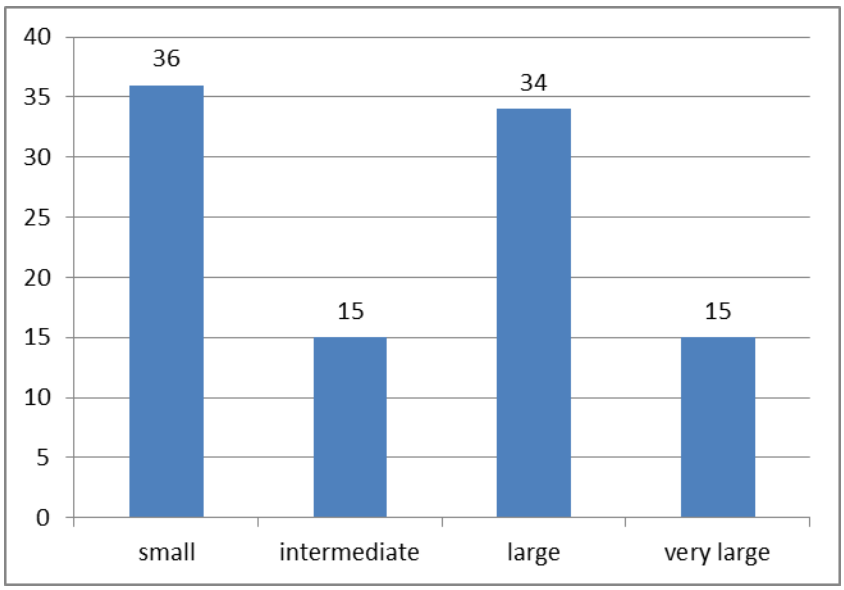
Platform size

Platforms can be categorised as small, intermediate (or medium) and large, depending on their size relative to other platforms. An indicator of size may be **the number of clients** a platform

has. Another may be **the number of workers**, or **the number of tasks or activities** facilitated (respectively, the revenue generated through these tasks) through the platform.

For example, the JRC study of 200 domestic and international platforms in the EU28 revealed the relative size of platforms in terms of turnover and users (comprising both clients and workers) (Fabo et al, 2017). The study distinguishes between small platforms, which have an annual turnover of less than €1 million and fewer than 10,000 users; intermediate platforms have between €1 million and €10 million in annual turnover and between 10,000 and 100,000 users; large platforms have between €10 million and €100 million in turnover and between 100,000 and 1 million users. Lastly, platforms are classified as very large platforms when they have over €100 million turnover and over 1 million users.

Figure 18: Percentage of platforms in the EU28 by size, 2017



Source: Based on Fabo et al, 2017.

As shown in the figure above, the 200 platforms in the JRC sample are divided into near equally sized categories of small and intermediate sized platforms (51%) and large and very large platforms (49%). However, it is important to note that the very large platforms (15% of the total, translating to 30 platforms) capture an enormous share of the market. In fact, one single very large platform has more turnover and more users than the 36% represented by small platforms combined.

Market position of the platform

The work related platform economy is characterised by strong network effects. The more members a network has, the more valuable membership becomes. In turn, larger networks are then more likely to attract new members. This may result in a 'winner-takes-all' scenario (Degryse, 2016). Platforms which establish themselves first and succeed in quickly attracting a critical mass of clients and workers may have a dominant position in the market and arrive at a near **monopoly** even if competition tries to enter the same market (McAfee and Brynjolfsson, 2017). The dominant position of the monopolist provides it with a lot of power over clients and workers (Kenney and Zysman, 2016).

Some markets see an **oligopoly**, where a few platforms own the largest share of the market (Prassl and Risak, 2016). Sometimes this centralisation of power is possible if the platforms offer tasks or services that are not offered elsewhere, or if the strength of network effects has resulted if not in a winner-takes-all, then at least a 'winner-takes-most' scenario.

Other markets see much **competition** between platforms to capture market share. Research has shown that platforms in these scenarios compete fiercely over workers as well as users (Newton, 2014)[7]. To enter the market, platforms may have to compete with already established service providers. The new entrant may quickly capture a large share of the market. However, after a while others imitate its technologies and services, which will see competitors challenge the platform within its own ecosystem (Casadesus-Masanell and Ruiz-Aliseda, 2008; Cennamo and Santalo, 2013).

In such markets, no single platform dominates the market and workers and clients may have more options to choose between platforms, thus theoretically affording them more power vis-à-vis the platform (Newlands et al, 2017). In practice, switching between platforms comes at a cost for the workers, who cannot transfer ratings or reviews and whose ability to procure work depends in large part on their work history on one platform. However, surveys of platform workers have found that workers are active on several platforms at the same time (Huws et al, 2017).

Sectors and occupation

In a study on the collaborative economy across EU countries in 2016, PwC and the European Commission's DG GROW agreed on exploring five sectors:

- Peer-to-peer accommodation;
- **Peer-to-peer transportation**;
- **On-demand household services**;
- **On-demand professional tasks**;
- Collaborative finance.

Platform work in Eurofound's understanding is captured within three of the five above main sectors, namely peer-to-peer transport, or 'short-distance app-based rides' such as provided by Uber and BlaBlacar (Vaughan and Daverio, 2016). The sector of on-demand household services includes tasks done through platforms such as TaskRabbit and home delivery of groceries and meals through platforms such as Deliveroo and Foodora. Further, the sector of on-demand professional tasks captures activities of professional and creative services as delivered through design platforms or, for example, Upwork (Vaughan and Daverio, 2016).

Transport

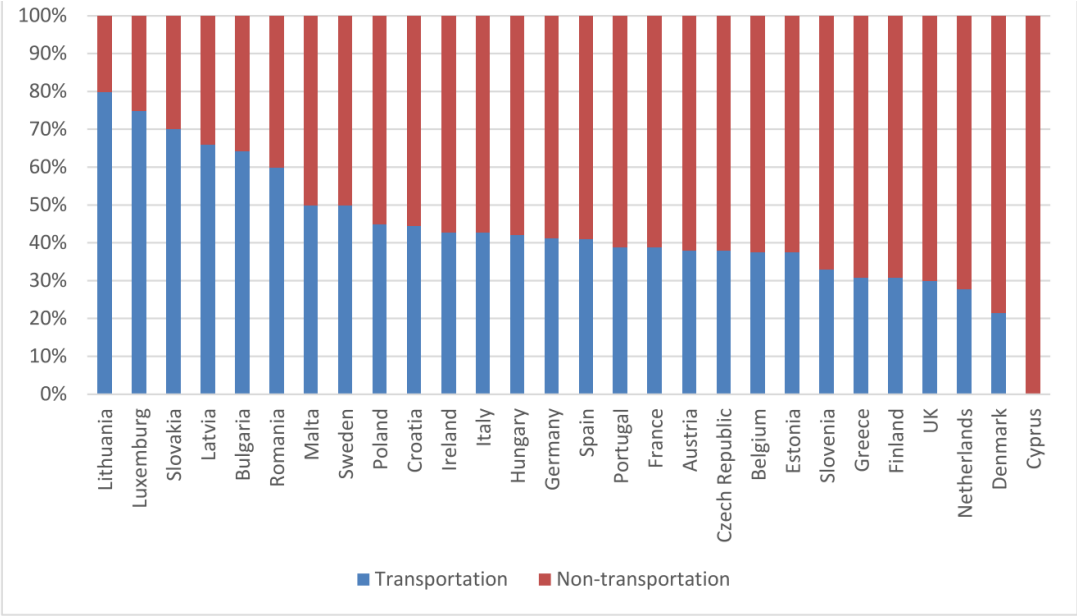
For the U.S., Harris and Krueger (2015, p. 2) estimated that 0.4% of the U.S. workforce were working 'with an online intermediary in the gig economy' which involves the use of 'an internet-based app to match clients to workers who perform discrete personal tasks' in 2014, which translated to approximately 600,000 individuals. Transport composed nearly two-thirds of the total platform work activities in the U.S. and globally it appears to be one of the fastest growing sectors in platform work. Within the world-wide app-based transport sector, Uber has the largest market share. It operated in 600 cities across 78 countries and offered four billion rides in 2017 alone, which is significant for a company that in its entire existence hit the five billion total rides mark only in May of 2017 (Bhuiyan, 2018).

The Canadian Labour Force Survey conducted among 100,000 individuals looked at two aspects of what they term the Canadian sharing economy, specifically transport and accommodation. Relevant for an indication of platform work, the survey found that approximately 0.3% of Canadians reported they had provided rides between November 2015 and October 2016 through platforms such as Lyft and Uber (Statistics Canada, 2017).

[7] For example, on 26 August 2014, The Verge reported that Uber had developed a competitive strategy called 'SLOG', in which independent contractors were given burner phones and credit cards with which to request rides from Lyft and other competitors. They then functioned as brand ambassadors and tried to recruit drivers to join Uber.

For their study on platforms in the EU28, Fabo et al (2017) distinguished between platforms that provided transport services, and those that offered other services. For example, 8 out of 10 platforms in Lithuania were transport platforms. Cyprus, on the other hand, has no transport platforms.

Figure 19: Share of transport platforms within the platform economy, per country, 2017



Source : Fabo et al, 2017, p. 9.

In Finland, transport services in 2016 composed a negligible share (2%) of the overall collaborative economy, but PwC believes it to be the fastest growing sector in Finland, which by 2020 will compose over 29% of the overall collaborative economy.

Table 8: Workers and clients in the collaborative economy in Finland, 2016

Sector	Proportion of workers offering this service	Proportion of clients using this service
Small tasks and household services (incl. food delivery)	51%	45%
Collaborative finance	34%	12%
Accommodation and facilities	10%	21%
Professional services	3%	1%
Peer-to-peer transportation and car sharing	2%	21%

Source: PWC, 2017

Also, PWC commissioned a representative survey of over 4,500 sharing economy consumers in Austria, Belgium, Germany, the Netherlands, Switzerland and Turkey (500 respondents per country), which was carried out between June and August 2017. Transport facilitated through

platforms, including Uber and other taxi apps, had been used by 16% of German respondents, 20% of Austrians, 26% of Swiss and 10% of Dutch individuals. In Turkey, as much as 40% of respondents had made use of such transport (PwC, 2018).

Online professional tasks

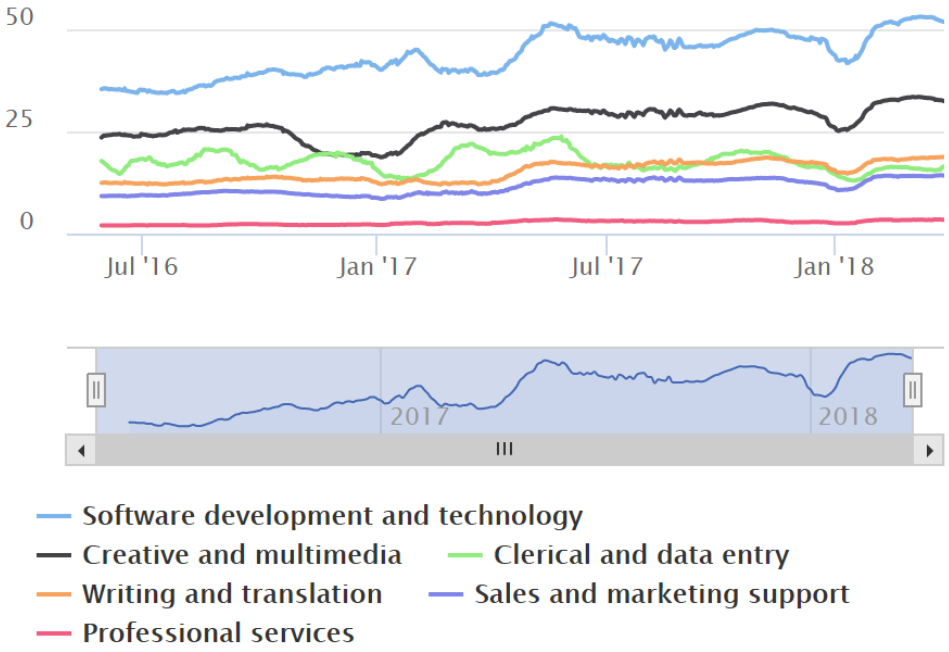
One of the world's largest platforms, Upwork, is estimated to have facilitated approximately 3 million projects in 2015, which combined were worth $1 billion (€852 million) (McAfee and Brynjolfsson, 2017, p. 189).

In the second quarter of 2017, approximately 65% of workers on Upwork were hired for their tech skills (Upwork, 2017). Overall, Upwork's 10 fastest growing skills had grown more than 300% compared with the same period the previous year. Virtual reality stood at number one, followed by skills related to developing artificial intelligence, such as natural language processing; econometrics, learning management systems, neural networks, Search Engine Optimisation (SEO), auditing and image processing. Additional fast growing skills on Upwork included various marketing skills. Different types of skills are required at different times, as evinced by a peak in demand for accountants in the first quarter of 2017, during the period in which most tax returns are due to be filed.

The Online Labour Index (OLI), an online tool produced by Kässi and Lehdonvirta as part of the iLabour project of the Oxford Internet Institute, tracks in real-time the supply and demand of the largest online freelance labour platforms in terms of clients and workers and transactions across countries and occupations. Analysis of data from July 2016 to June 2017 shows that software development and technology work were the occupations in which the largest number of tasks was posted. The second largest occupation was creative and multimedia and the third largest was clerical and data entry (Lehdonvirta, 2017).

Further, the Oxford Internet Institute has tracked tasks posted on the five largest English language platforms dealing with online services. The figure below shows the distribution of posted tasks across six of the main occupations found on these platforms and how they vary per month (based on the calculated average of every 28-day period). The index is normalised so that in May 2016, when the index went online for the first time, the total number of new projects held at 100 points. By 27 March 2018, the average number of posted tasks had increased by 36.1 index points (36.1%) from May 2016. The lower part of the figure shows the overall change in the number of posted tasks across time.

Figure 20: Screenshot of 28-day average of occupations of posted tasks on AMT, Fiverr, Freelancer, PeoplePerHour and Guru *between July 2016 and March 2018*



Source: Online Labour Index by Kässi and Lehdonvirta, 2016. http://ilabour.oii.ox.ac.uk/online-labour-index/ (Last accessed 27 March 2018).

Online micro tasks

On AMT, the most often traded tasks in 2015 pertained to identifying information in images (37% of total volume of traded tasks), followed by transcription of audio or video material (26%) and lastly, classification of images at 13% (Hitlin, 2016, p. 9).

Classification of online occupations and tasks

The table below details examples of tasks found in the most common occupations within platform work, based on Kässi and Lehdonvirta (2016).

Table 9: Classification of occupations and examples of tasks in platform work

Occupation	**Examples**
Professional tasks	Accounting Consulting Financial planning Legal services Human resources Project management
Clerical and data entry	Customer services Data entry Transcription Image tagging Content moderation Web research

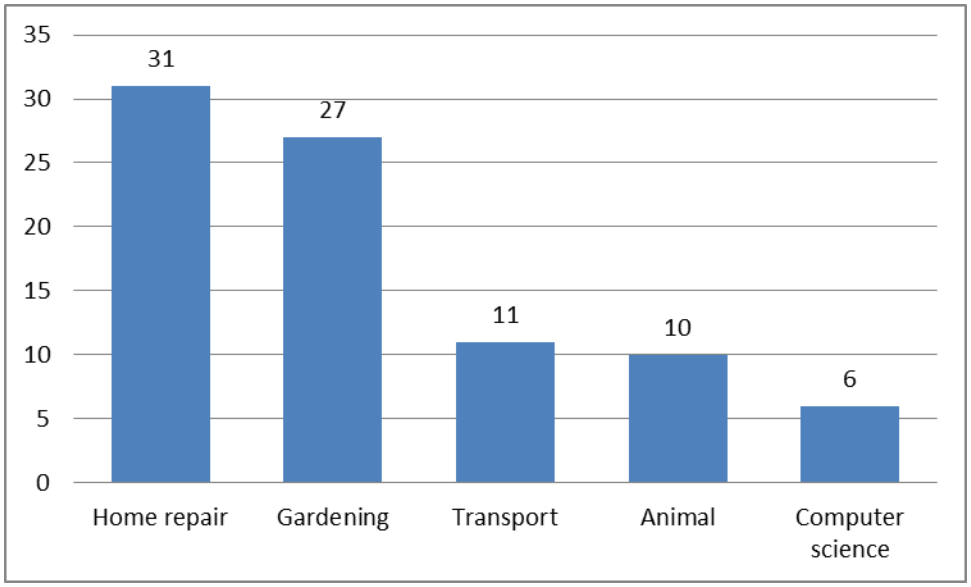
Creative and multimedia	Design Audio Photography Video and audio production Voice acting
Sales and marketing support	Advertising Search engine optimisation (SEO) Telemarketing Generating leads
Software development and technology	Software development Web development Web crawling and scraping Data science Game development Virtual reality
Writing and translation	Creative writing Technical writing Academic writing Article or blog writing Translation Copywriting and editing

Source: Kässi and Lehdonvirta, 2016, p. 10.

Locally delivered/on-demand household services

On the Belgian Listminut (resembling TaskRabbit), between December 2013 and December 2015, 9,459 tasks were posted, of which only a little over 25% was matched and completed (2,396 tasks in total). Of these completed tasks, 31% were in home repair. An additional 27% took place in tasks related to gardening, followed by two occupations that were nearly equally large, namely animal care or pet sitting with 10% and transport services with 11% (De Groen et al, 2016).

Figure 21: The five main categories of completed tasks on Listminut, December 2013-December 2015



Source: De Groen et al, 2016, p. 9.

For the classification of locally delivered services, the occupations within platform work derive partly from De Groen et al's (2016) investigation of the local Belgian matching platform ListMinut and are supplemented with occupations and tasks found on a wider range of platforms.

Table 10: Classification of occupations and examples of tasks in local platform work

Occupational classes	Examples
Household	Plumbing Household appliance repair Assembling furniture Cleaning Other household tasks
Animals	Dog walking Pet sitting
Tutoring	Exam training Language training
Gardening	Mowing grass Weeding
Transport	Taxi Moving services Bike delivery services Food delivery
Computer science	Installing software Setting up printer Installing wireless

Babysitting	Babysitting

Source: Own elaboration based on De Groen et al, 2016 and Codagnone et al, 2016b.

Dynamism of the platform

Digital labour platforms and the context in which they operate are changing rapidly; however, some platforms appear more static than others. For example, when AMT had developed a platform to remove duplicate pages for its own retail website, Amazon, it recognised the value for other companies and opened it up to a potentially worldwide audience of clients and workers in 2005 (Bergvall-Kåreborn and Howcroft, 2014). After this initial large shift, AMT has remained relatively **stable**, in the sense that little change has taken place in its interface, terms of use, business model or mode of interaction with clients and workers since its conception (Irani, 2015). An example of a **dynamic** platform is TaskRabbit, which adjusted its business model in 2014. The platform pivoted away from the bidding system to a fixed price per task system (Taylor, 2015).

Transparency of client and worker

Some platform work relationships between clients and workers may take place entirely **anonymously**. This is commonly found on micro task platforms such as AMT and in design contests such as on GoPillar (Schmidt, 2016).

Alternatively, in markets where the stakes are higher in terms of personal safety or monetary value or where tasks and projects are of longer duration, platforms may provide each person with information on the party they are working with. Each party's identity is **disclosed** to the other in the initial matching stage. For example, Upwork and Freelancer facilitate the sharing of personal information between participants to stimulate accountability and good behaviour. Upwork encourages participants to link their social media pages to their work profile. Similarly, in local platform work such as household chores or ridesharing apps, clients and workers choose each other based on their online profile, which usually contains personal information as well as reviews or ratings. Aspects such as kindness, punctuality and a neat appearance are more relevant in this setting than in anonymous settings and may affect ratings.

Fees to the platform

Platforms generate income through levelling fees. Models for revenue generation differ along the lines of the moment in the trading process where the intermediary deducts payment for its services. This may occur at the first point of contact, which is **registration**. Here, the client, worker or both pay a set fee to make use of the platform's services. Conversely, some platforms demand payment only for the **successful matching** of workers and clients. Yet other platforms demand payment when **tasks are successfully completed**. Often, workers receive a fixed predefined compensation and the platform is paid based on a percentage of the total monetary transaction from client to worker, called commission fee (Aloisi, 2015; Leimeister et al, 2016).

Realisation of payments

Monetary transactions between client and worker may be **realised directly** between client and worker, for example when worker and client are matched online but the work takes place face to face. Alternatively, and more commonly, payment is organised **through the platform** (Prassl and Risak, 2016), for instance through a mutual trust arrangement where the client deposits an agreed amount that is held by the platform until work has been delivered and approved. Examples include Upwork's 'escrow' system.

Conduct of the platform

Most activities through platforms can take place only after a user agreement has been undersigned which specifies the **terms and conditions** of use of the platform services. Terms and conditions usually describe the rights and obligations of each of the parties in the legal language of consumer law. They can be exhaustive, resulting in workers agreeing to terms they did not read or understand, or they may be brief and vague, which is a strategy that gives the term-setting party much space to manoeuvre, for example on what data it stores and what they are used for (Lomas and Dillet, 2015). Here, the relationship of power is skewed strongly in favour of the platform which sets the terms of engagement. Notably, the terms and conditions specify the nature of the legal relationship among the three parties involved (van Doorn, 2017), the ownership of intellectual property rights, and describe where liability is due in case of conflict or damage.

Some platforms have formulated core values to regulate the interactions between participants and create a comfortable, productive and safe atmosphere. Initially drafted by Testbirds, other platforms have undersigned these values and are committed to **adhere to specific codes of conduct**, which may include topics such as fair payment and fair time demands, privacy and confidentiality (Deva and Wasza, 2016). In addition to regulating the behaviour of participants, codes of conduct may be drawn up in anticipation of legislation. Increasingly, policymakers have turned their attention to platform work activities and the formulation of codes of conduct may pre-emptively try to set certain standards in the hopes that they will influence the priorities of future legislation. For example, in February 2018, Uber published a White Paper that states a wish to codify 'safe harbours in law' to ensure the company will in the future no longer be subject to employment claims from its drivers (Uber, 2018).

Control and surveillance

Monitoring of the worker's performance may occur through the platform, but is ultimately used to confer power on the client, whose rating of the performance directly impacts the employability of the worker (Nosko and Tadelis, 2015; Rosenblat and Stark, 2016; Whiting et al, 2016). These management or control features are considered to 'strongly impact on platform workers' time use, income and creativity and thus on their working and living conditions' (Schörpf et al, 2017, p. 43). For example, Uber tracks the journey of the ride and uses the data to mediate conflicts between clients and drivers in case of disputes over pay. Uber's 'claim to adjudication is rooted in the notion that its data on both passengers and drivers are akin to an objective, third-party witness' (Rosenblat and Stark, 2016, p. 3765). Another example of extensive monitoring is Upwork's work diary (app). The application monitors workers' keystrokes and takes frequent screenshots. Clients can access their worker's work diary and see how productive they have been. Close monitoring of work appears in the first instance to favour the demand side of the market, as the platform ensures continued business by guaranteeing clients get what they paid for, although it can also be seen as a strategy for recourse in case of disputes. Conversely, websites such as AMT and many contest platforms provide very little oversight or monitoring.

Rating

Some platforms allow **only the client** to rate the worker's performance and do not allow the worker to rate their experience of working with the client. For companies such as Uber and Lyft, this rating mechanism serves to enforce specific rules or standards that may influence drivers' manner of dress, level of cleanliness and behaviour (Aloisi, 2015). Other platforms allow **both client and worker** to rate the party they have worked with, such as on Upwork. Further, some rating systems are based on forms that standardise qualifications or skills across workers whereas others allow the reviewer to assign qualifications or attributes to the party they have worked with.

Autonomy in task completion

Platform work has been described as a system for the coordination of work that falls somewhere between the existing organisational forms of market and hierarchy. Some tasks can have the flexibility of market-like interactions, which facilitate entrepreneurship, while others appear more like hierarchies, in which workers have less autonomy (Sundararajan, 2016; Durward et al, 2016). Notably, the level of discretion of the workers matters for their legal employment status, as the level of influence exerted over the worker is often used as a legal criterion to determine the worker's vulnerability vis-à-vis the client and thus the scope of the protections they are entitled to within the confines of labour law (Waas and van Voss, 2017; Waas et al, 2017).

Some tasks are by definition activities which influence when workers work, how they work, and the tools they use to perform their tasks. For instance, transcribing audio recordings or searching for addresses is stringently pre-defined and restrictive. This is particularly the case in the domain of micro tasking. In this case, the structure of the working relationship is **hierarchical** and the worker has **low autonomy**, for example in setting prices or selecting tasks. For example, platforms such Luxe, Postmates and Universal Avenue resemble hierarchies as the platform coordinates service provision to a more extensive degree (Sundararajan, 2016, pp. 77–78).

In other situations, workers may have comparatively **high levels of autonomy** regarding the sequence, method and procedure of task processing, which is characterised as **market-like**. Market-like platforms intermediate tasks that are usually of high complexity and low granularity. Often involving more intensive interactions between clients and platform workers, these platforms show more characteristics of a marketplace than other types of platforms (Leimeister et al, 2016). Here, workers act almost as entrepreneurs and determine their own hours and where and how they work. For instance, platforms such as Upwork, Thumbtack and the local tour guide exchange platform Vayable are considered to resemble a market. Ridesharing platforms Lyft and Uber fall somewhere between market and hierarchy as these platforms offer the worker moderate autonomy. For example, workers are free to choose when to work, but not how much to charge. As such, the work relationship between platform and workers is neither completely hierarchical, nor does the platform facilitate 'real entrepreneurship' (Sundararajan, 2016, pp. 77–78).

Price setting

Some platforms do not set any prices but leave it to the **discretion** of the worker and the client to agree on an hourly or fixed amount and mode of payment. Others apply a **minimum** amount for specific tasks, for example a minimum price of €200 for designing a logo. Alternatively, platforms may set a **standard price**, for example €300 for producing a video, based on market prices and assumed number of hours spent by the average worker for such a task (Eurofound, 2015). Then, some platforms use **dynamic pricing**, which is algorithmically adjusted in response to increases and decreases in demand and supply. Examples of dynamic pricing include Uber. The taxi service uses an algorithmically determined 'surge pricing', which increases the cost of a trip when demand is high and warns drivers of expected peaks in demand ahead of time (Chen et al, 2015; De Groen and Maselli, 2016; Horton and Zeckhauser, 2010). In 2015, Diakoupolis examined Uber's publicly available data for Washington and found that prices changed every 3 to 4 minutes, up to 20 times an hour (Diakopolous, 2015).

Additional services offered by the platform

Some platforms exclusively **match** workers to advertised tasks based on their skillset and availability. Other platforms are less focussed on matching, and more on **task management**, for example by breaking projects into micro tasks.

Further, platforms offer various levels of **guidance** for clients and workers. For example, Upwork has a manual for workers intended to help them secure tasks. The platform also

offers extensive hiring advice for clients. Alternatively, platforms such as TaskRabbit offer less guidance outside of its terms and conditions although it does make recommendations on how workers, and clients, can stay safe in the work process.

Platforms offer more or less extensive services in **pre-screening**. For example, Upwork sends workers recommendations for tasks recently posted that appear to match their skills and experience. For clients on Upwork, different subscription plans offer varying levels of pre-screened recommendations and active help with recruitment.

Lastly, some platforms offer **training for workers** that is intended to enhance their chances to secure work, for example through developing good communication skills, improving existent skills or learning new skills. For example, the software and app testing platform testCloud examines workers' abilities before they can commence working, trains them through the 'testCloud Academy' and coaches them throughout their work (Zogaj et al, 2014, p. 19).

Clients

Clients of platform work may be private individuals, private organisations, or public organisations. A transaction between a given worker and a private individual (client) is considered a **peer-to-peer** exchange (P2P). Situations in which private organisations avail themselves of platform work are considered **peer-to-business** exchanges (P2B) (Codagnone et al, 2016a, 2016b). Such interactions are very common, in particular on freelance sites such as Upwork, on which small businesses account for an estimated 70% of all hires (Hill, 2015b, p. 104). On AMT, businesses are also well represented. During a short-term study of AMT platform activity in December 2015, the Pew Research Center found that the five most active clients were companies and together accounted for 53% of all tasks posted (Hitlin, 2016).

The **public sector** is often restrained for resources and may struggle to support projects that require large amounts of small tasks to be completed, for example administrative tasks and data entry. Additionally, the public sector may require to pilot solutions before investing in a roll-out across communities or populations. In these situations, platform work may be useful. For example, the U.S. Food and Drug Administration made use of crowd researchers who compared research results and piloted test methods (Deloitte, 2016, p. 5).

Technical accessibility of the platform for workers

Platforms accessible to any worker who registers are considered **open**. However, many platforms offer one or other variety of subscription plans to **restrict** or limit the technical accessibility of workers. In particular, in creative industries, monthly or annual subscription fees limit access for non-paying members. For example, the UK platform ProductionBase, for TV, film and production professionals, charges an annual fee of £65 (€73 as of 1 March 2018) for a standard subscription and £90 (about €100) for a 'Freelancer Pro' subscription for services such as uploading a CV and viewing and responding to task advertisements.

Interviewees for BEIS (2018b, p. 39) indicated that in their experience, full access is often limited to subscription.

Social accessibility of the platform for workers

Another type of open or restricted accessibility can involve qualification checks, such as having a drivers' license for platforms such as Lyft and Uber, although it has been debated how rigorously these are checked. Other platforms may institute capability tests, such as a translation and general language test on translation platform Gengo. Some criteria for access relate to the geographical location in which the workers are based. For example, in 2012, AMT suspended registration for new workers for a few months, and when registration was reopened again, it was limited to US-based workers only (Turkrequesters, 2013). Alternatively, some platforms such as AMT and Upwork offer different levels of accessibility to job opportunities depending on workers' task completion record or rating on the platform.

Form of matching

The process of assigning workers to clients, or allowing clients and workers to find each other, is the main issue for platforms (Einav et al, 2016). The structure of the platform and its algorithms determine how clients and workers find each other, what information is shared, how clients and workers communicate and how they make decisions (Newlands et al, 2017). Platforms are highly invested in optimising the matching process, as the more smoothly clients are matched to workers, the more reason they will have to stay exclusively on one platform, instead of using a different platform or exiting the market (Codagnone et al, 2016b; Einav et al, 2016).

In **contest structures**, an open-call format is used to broadcast an opportunity to contribute to a wide audience. This strategy depends on participants to search for or otherwise find the open call and self-select for participation (Geiger et al, 2011; Geiger et al, 2012; Howe, 2006).

For service procurement/offer, one way in which the matching process may be conducted is through **allocation**. For example, Uber has people looking for a ride, and people looking to offer rides. The system aggregates information and allocates a request to a given driver, who may refuse or accept (Newlands et al, 2017). This algorithmic assignment of tasks is made possible because Uber offers only a limited range of services, namely the ride. Conversely, in markets where the diversity of services ranges more widely, direct allocation is difficult. When matching specific demands with specific supply, the platform's search options, presentation of search results and individual choice become more important (Einav et al, 2016). Procurement here is often based on **a bidding process**.

Initiator of the activity

Platform work may be differentiated based on who first introduces the contact, which may be either the client or the worker. When the **clients initiate**, they outline the task specifications (Howcroft and Bergvall-Kareborn, 2016). Platform workers respond by bidding for the task. Conversely, other types of platform work may be **initiated by workers,** who describe the skills and services they can offer on the platforms, which can then be searched by potential clients looking for some tasks to be realised (Mandl and Curtarelli, 2017).

Selector

Selection can be made by the client or worker (depending on the initiation of the process) as well as by the platform. In Uber's case, for example, the **platform** algorithmically allocates a given driver to a client. Both client and driver have an opportunity to refuse the selection offered to them, but the platform processes the information of the parties involved and uses the outcome to decide on and select a match.

Alternatively, platforms may offer the **client/worker** complete autonomy in using information provided to select a worker/client for a given task or project. Examples include Upwork, where workers can select their own search criteria to look for a task and clients may select workers based on the offer they make, or may contact a given worker at their own discretion. The eventual selection depends entirely on the outcome of the **negotiation between worker and client**.

Number of paid platform workers per task

Most forms of platform work see workers deliver a service, for which they are directly remunerated by the client. In many cases, this is a one on one exchange; although a variety of other options are possible.

When a contest poses a task to the crowd, the challenge may be taken up by several platform workers. Although all members will deliver a service, it is likely there will be only **one winner** (Felstiner, 2011). For example, on the design platform GoPillar, the client selects one design from probably many which have been submitted in response to their call. Alternatively, some contests allow the client to **pick more than one winner**. Also, in some

contests, it is possible for several platform workers to cooperate with others to win a challenge, such as on the data science contest platform Kaggle, where generally teams compete to solve machine-learning problems. On occasion, members who have contributed to solving an issue more significantly than others, for example in teams working together on coding programmes or solving a scientific problem, may receive a larger share of the overall amount awarded than less productive members in the group. Also, some contests reward a winner (largest share of the prize), second place and third place (Carmel et al, 2012). This is referred to as staggered remuneration.

In addition to these methods of awarding compensation, it is also sometimes possible for all participants to be remunerated for completing a survey, such as on AMT.

Scale of tasks

Platform work has started, and still to a great extent centres around the decomposition of large tasks into smaller ones (Alkhatib et al, 2017). Some platforms enable clients to split an activity into a multitude of **micro tasks**, which are then sourced to the crowd. Electronically transmittable cognitive micro tasks paid per piece are traded on platforms such as AMT, Clickworker and CrowdFlower. Large companies such as Google and Facebook make extensive use of this, for example for purposes of content moderation, where platform workers identify sexual, violent or otherwise offensive material in images and text (Irani, 2015). Typical work pieces include object classification, tagging, and transcriptions. Micro tasks are highly standardised, repetitive, and require low to medium skills levels. The time required to perform a micro task is generally low, as is its remuneration (Aloisi, 2015; Codagnone et al, 2016a; Durward et al, 2016).

In contrast to micro tasks, platform work may also involve **larger scale tasks** or projects. In this case, client and worker may engage in a long-term relationship, such as with translation services. Remuneration for long-term services is more likely to approach market compensation and is less likely to be conducted anonymously as it requires more information exchange and trust between client and worker (Rouse, 2010).

Complexity of tasks

Platform work can be related to routine tasks, complex tasks, and creative tasks (Hoßfeld et al, 2012; Rouse, 2010). **Routine tasks** are simple, non-innovate activities that require little effort, little prior knowledge und usually only a few clicks to be completed. In platform work, routine tasks may include digitising texts, extracting data from websites, and tagging images. Increasingly, workflow systems allow for aggregation of piecework that can in itself be quite complex. However, there are limits. For example, although data analysis tasks like categorisation and clustering are possible, there is not yet a good solution to assemble an analysis or make sense of results (Alkhatib, 2017, p. 3).

Complex tasks are moderately innovative and require more effort than routine tasks. These tasks may involve content creation such as writing blog entries, commenting or writing reviews about products, participating in user surveys or testing web and software applications.

Tasks with the highest level of complexity are defined as **creative tasks**. These require prior knowledge, are sophisticated or innovative in character and require due effort. Activities may include software and web development, solving complex problems and research questions (Hoßfeld et al, 2012, p. 206).

Required skills

A given task may be differentiated by the level of skills that it requires, which may be low, medium, or high. This characterisation refers to the traded tasks and not necessarily to the skills that the workers possess, since it is not uncommon that highly educated individuals carry out simple errands through TaskRabbit or similar platforms (Codagnone et al, 2016a, p. 18).

Among **low skill** activities are manual tasks and tasks that may be performed by anyone without requiring specific know-how or prior instruction. Online low-skill tasks may include 'click work', or other forms of short, repetitive routine tasks (Huws, 2016).

Medium skill tasks include clerical work, such as data entry, customer service or accounting (Aloisi, 2015; Prassl and Risak, 2016; Yordanova, 2015). Conversely, some platform work requires **high skills** levels, such as professional or specialist activities, for example, the provision of legal services or accountancy, such as Upcounsel (Aloisi, 2015; ILO, 2016a).

Format of service provision

Some services or products may be electronically intermediated through platform work. In other words, they are **online services** which can be delivered from any location in the world as long as there is an internet connection. Within online delivered services, there are two types of tasks (Codagnone et al, 2016a, p. 5; De Groen and Maselli, 2016, p.2). The first type comprises micro tasks, such as image tagging, data entry, classifying web pages, reviewing documents, checking websites for specific content, validating search results, etc. These tasks require low to medium level skills. The second type of task within online services comprise self-contained projects that require medium to high level skills, such as software development, writing and editing and professional tasks.

Other services are **local** and delivered in specific locations (Codagnone et al, 2016a; De Groen and Maselli, 2016). These services are also divided into two types. The first type comprises low skilled manual tasks that may include dog walking, child caring, cleaning, assembling furniture, food delivery or chauffeuring services (Codagnone et al, 2016a; Drahokoupil and Fabo, 2016; Eurofound, 2015; Felstiner, 2011; Valenduc and Vendramin, 2016). The second type within locally delivered services is interactive and requires higher skill levels, such as teaching (Codganone et al, 2016a).

Additionally, there may be locally delivered services that are performed in the **global** market, where workers and clients are in different geographic locations. Examples include store audits and field photography performed through platforms like Gigwalk (Teodoro et al, 2014).

In short: Eurofound's theoretical typology on platform work

The above sections summarise the approaches of individual researchers to classify platform work. As to the knowledge of the authors of this paper, this is the first attempt to comprehensively compile the various 'classification elements' considered in extant literature. What becomes apparent is the wide variety of elements and their manifestations – and accordingly their potential combinations.

The following table provides an overview of the identified classification elements as well as their different manifestations. Some of the elements indicated in the table (numbers 2, 13-15 and 25) are not discussed in the text above. The reason for this is that the authors of this working paper did not find any extant literature on it (elements number 2 and 25) or that these elements are discussed in more detail in the following sections of this working paper on implications on working and employment conditions (elements number 13-15). Nevertheless, they are considered in this overview as the authors deem them relevant when indicating a platform work typology.

Table 11: Eurofound's theoretical classification elements for platform work and their manifestations

No.	Categorisation element	Manifestations
1	Relationship between platform, client and worker	Platform owner ≠ client, undefined crowd of clients and workers Employer-owned internal platform (platform owner = client, defined group of

		workers) Company-owned outsourcing platforms (platform owner = client, undefined crowd of workers) Cooperative platform structure (client = members of the platform, undefined crowd of workers)
2	Geographic scope of the platform	Regional/national International/several countries
3	Size of platform	Number of clients (relative to other platforms) Number of workers (relative to other platforms) Number of tasks or activities (relative to other platforms) Platform revenue
4	Market position of platform	Monopoly Oligopoly Competition
5	Sector, occupations	NACE (alternatively, as often used: transport, household tasks, professional tasks) ISCO (alternatively: task descriptions)
6	Dynamism of platform	Stable/static Dynamically changing
7	Transparency of client and worker	Anonymous Disclosed
8	Fees to platform	Registration (client, worker, task) Successful matching Successful task completion
9	Realisation of payments	Directly between client and worker Through the platform (deposit)
10	Conduct of platform	Existence and characteristics of terms and conditions Adherence to specific codes of conduct (for example, anti-discrimination) Data protection mechanisms Control/surveillance mechanisms Information provided to workers and clients (transparency) Ratings
11	Autonomy, incl. price setting	Hierarchy-like (low autonomy) (working time restrictions imposed by clients/platform, price setting determined by platform (standard or minimum prices)

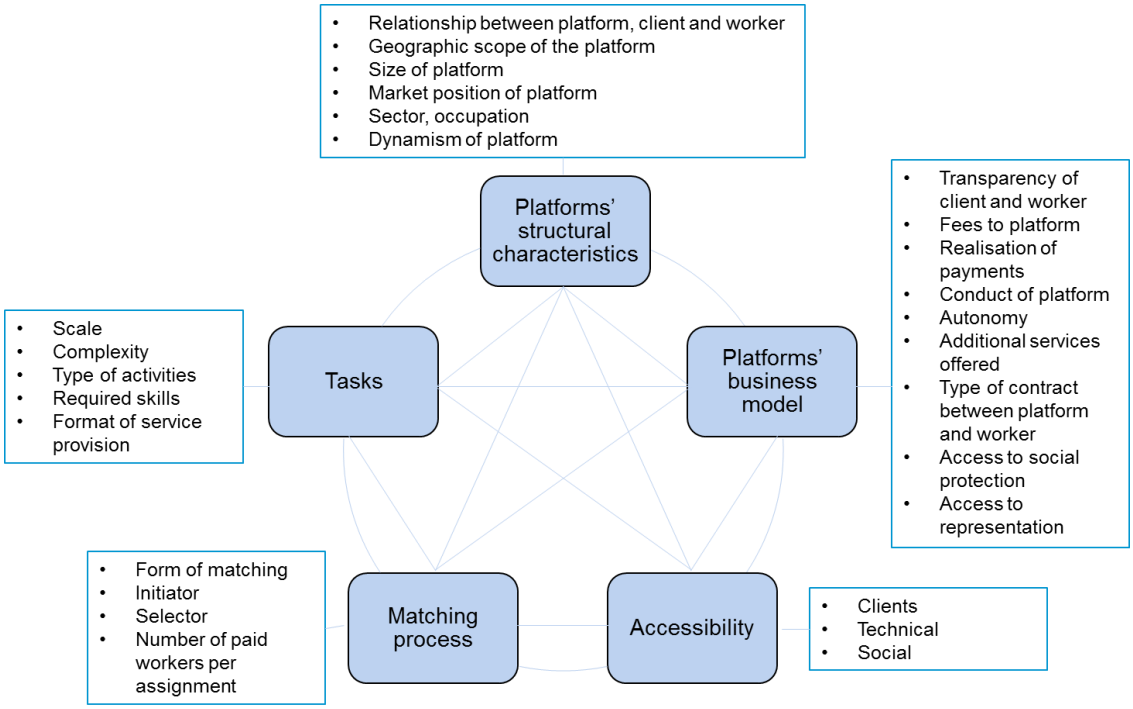
		or client) Market-like (high autonomy) (worker free to choose when and how long to work, price setting determined by worker)
12	Additional services offered by the platform	Matching vs. management of tasks Guidance/recommendations for clients and workers Pre-screening of ads/offers Training for workers
13	Type of contract/employment status between platform and platform workers	Employment relationship/labour law Civil law contract
14	Access to social protection	Full access Partial access No access
15	Access to representation	Full access Partial access No access
16	Clients	Private individual Private organisation Public organisation
17	Accessibility of platform (technical)	Generally open Restricted (eligibility criteria, vetting of workers)
18	Accessibility of platform (social)	Generally open Restricted (eligibility criteria, vetting of workers)
19	Form of matching	Competition/contest Procurement/specification/offer
20	Initiator	Client Worker
21	Selector	Client Platform (by algorithm, manual) Platform worker Third party/panel
22	Number of paid platform workers per assignment	One winner Several winners All participants
23	Scale of tasks	Micro Larger (projects)
24	Complexity of tasks	Routine tasks (simple, non-innovative) Complex tasks (moderate) Creative tasks (sophisticated, innovative,

		cognitive)
25	Type of activities	Generalist Specialist
26	Required skills	Low (manual, amateurs) Medium (clerical) High (professionals, specialists)
27	Format of service provision	Online Local (platform, client and workers in the same location) Local (platform, client and workers in different locations)

Source: Own compilation

The above classification elements can be grouped into those related to the platforms' structural characteristics (numbers 1-6), the business model of the platforms (numbers 7-15), the eligibility/accessibility to platform work (numbers 16-18), the matching process (numbers 19-22) and finally those referring specifically to the tasks commissioned through platform work (numbers 23-27).

Figure 22: Schematic overview of Eurofound's theoretical classification elements for platform work



Source: Own compilation

Following from the above, Eurofound's understanding of a 'platform work type' is a combination of a specific manifestation of each of the identified classification elements with a specific manifestation of each of the other classification elements described above. As an example, a platform work type identified along the above logic would refer to an employment form in which:

- The platform is run by an organisation whose business purpose is to match supply and demand for paid labour through their platform;
- The platform is active in a single country;
- The platform is 'small' in terms of the number of clients, workers, tasks and revenue;
- The platform has a monopoly on the market;
- The platform provides matching supply and demand for transport services;
- The platform has a stable business model;
- The platform discloses the details of workers and clients amongst them;
- The platform charges a fee based on successful task completion;
- Payment is directly realised between the client and the worker;
- The platform has specific terms and conditions adhering to more general codes of conduct;
- The platform runs a market-like business model, leaving the arrangements on task completion and working conditions (including pay) to the client and worker;
- The platform does not provide additional services to workers and clients;
- The platform has a civil law contract with both the client and the worker;
- The platform does not provide specific access to social protection or representation to the workers;
- Clients are mainly private individuals;
- All workers who hold a drivers' licence have access to the full functionality of the platform;
- The tasks are announced on a specification/offer basis;

- Tasks are initiated by the client;
- The client selects the worker;
- One worker is selected for each task advertised on the platform;
- The offered tasks are small;
- The offered tasks are routine tasks;
- The tasks require generalist, low skill levels;
- The tasks are delivered locally, with the client and the worker at the same location.

Similarly, other platform work forms are constructed by other combinations of the identified elements. Accordingly, the above theoretical framework gives rise to millions of different potential platform work types, when each possible combination is considered.

The authors of this paper are aware that this is a very theoretical discussion, with a high number of potential combinations not operational in practice, yet; and some of these potential combinations will most probably never be realised in practice. On the one hand, this is due to overlap between some of the above-described elements, which leads them to travel together rather than in other combinations. For example, micro tasks tend to be related to low complexity, low skills required and low levels of autonomy rather than to other characteristics of the respective classification elements. On the other hand, it can be assumed that even if dynamic, the future development of platform work will be faced with some limitations (for example, due to cultural or legal aspects), so that not all of the theoretically possible applications will ever be realised.

However, this theoretical framework is useful to show the (theoretical) potential of this employment form (once it becomes more 'common' on the labour markets) and could furthermore be used to streamline further research on the topic. Using this typology could contribute to a better comparability of individual research which can enhance the knowledge base on this new employment form. For such, better operationalisation of some of the identified elements and their manifestations will be required. It is, for example, somewhat surprising that while discussions on 'micro tasks' are prevalent when talking about platform work, there is no strong definition of what constitutes a micro tasks (for example, is it just 'a click' or also other assignments of short duration, and if so, what would be the threshold to differentiate them from a 'larger tasks').

Finally, establishing a typology for platform work is important when discussing working and employment conditions– as will be done in the following sections of this paper – as it can be assumed that different combinations of different elements result in different effects on the labour market.

Implications for working conditions

Physical health and safety risks

EU-OSHA (2017) notes that the similarities between platform workers and temporary and agency workers may mean they are exposed to the same psychosocial and physical risks, and studies have shown that these risks are significant (Benavides et al, 2006; Howard, 2017; Tran and Sokas, 2017; Wilde, 2016). Some locally delivered platform work takes place in occupations that have a traditional higher incidence of work-related injuries, for example, the transportation sector. These risks may be more elevated for platform workers, who may have less experience or knowledge of how to manage risks, in particular because platform workers tend to be younger (Tran and Sokas, 2017). Between January 2016 and April 2017, Huws et al (2017) conducted 15 face-to-face in-depth qualitative interviews with platform workers (13 with UK platform workers and two Estonian). Drivers reported having witnessed physical as well as sexual assaults on passengers by other passengers as well as having experienced assaults themselves by their passengers and taxi drivers. Furthermore, they reported 'tasks which involved being sent to collect or deliver illegal drugs, handle stolen goods, purchase alcohol and run errands for criminal gangs, as well as being sexually propositioned by clients' (Huws et al, 2017, p. 47).

Also, tasks performed in the homes of clients carry risk of inter-personal violence and harassment, as well as the risk of accidents, or contact with chemicals, for example in cleaning materials.

Huws (2016) notes that these physical risks may be exacerbated by a lack of training and certification; lack of knowledge or understanding by workers and clients of regulations that apply to the work; lack of concrete work specification; lack of safety equipment and clothing; time pressure that leads to cutting corners in terms of OSH procedures and lack of sufficient work breaks; interruptions and distractions; exhaustion stemming from overwork; and otherwise exposure to risks that would not be accepted in a workplace environment.

For online delivered tasks, working on computers carries the risk of physical health impacts with visual fatigue or musculoskeletal problems (Huws, 2016). As pointed out by Tran and Sokas (2017, p. 64), the safety risk for platform workers can be expected to be worse due to 'the loss of the protective effect of working in a public workplace' as the work often takes place at home or in environments that are not designated work environments. Therefore, it is likely that ergonomic requirements are violated. For example, the laptop or other tools may not meet ergonomic standards; the work environment may be noisy and inappropriately lit and induce the adoption of poor postures that will lead to musculoskeletal problems; time pressure for deadlines is conducive to high intensity work done at a rapid pace without appropriate breaks, which can lead to visual strain, strain injuries and work-related stress.

Working time and work-life balance

Surveys suggest that the majority of active workers do platform work for fewer than 30 hours a week (Brawley and Pury, 2016). For example, the RSA's survey of approximately 8,000 UK residents of 15 years and older found that of the 2.2% who indicated they were currently active in platform work, 80% worked less than 16 hours per week. Only about 8% of platform workers indicated they did platform work full-time (Balaram et al, 2017). However, working time may show structural differences between workers who have platform work earnings as their primary source of income and those who do not. The ILO (2016) indicates that for online workers, competition pushes down wages, which makes it necessary for workers dependent on these earnings to work long hours. Similarly, platform workers providing transport who depend on these earnings can work very long hours (Wilde, 2016). Many spend long periods searching for work (unpaid labour) and are under pressure to take on tasks for which they are not qualified, or which they are forced to perform at anti-social hours (DG IPOL, 2017). For example, there is more demand for taxi services during the evenings and

weekends, when most people spend time with family or friends, all of which can contribute to increased social isolation.

Huws et al (2017) found in interviews with UK platform workers that some experienced psycho-social health hazards connected to long working hours, 'including long and unpredictable waiting periods'. They were exposed to such risks due to their reluctance to refuse work, in particular for fear of bad ratings. Similarly, other studies show that even when platform workers set themselves the goal of limited working hours, they are sometimes unable to stop (Jiang et al, 2015). This is due to the feast-and-famine of work availability on the one hand, and the fear of being penalised by the platform or clients for being unavailable on the other. Lehdonvirta (2018) notes an interview excerpt of a male platform worker who quit his job to micro task full time. The worker reportedly spent 20 hours a day at his computer and had no set hours to sleep (Lehdonvirta, 2018, p. 18). Although this example may be extreme, other studies also indicate platform workers being on-call at all times, interrupting social engagements and personal time to work, or waking up in the middle of the night to bid on projects or 'grab tasks' when they are posted in a different time zone (Martin et al, 2016).

Workers' sense of having to be available at all times in platform work blurs the lines between private and professional life (European Commission, 2015; Martin et al, 2016; Smith and Leberstein, 2015). Also, workers may find they cannot enjoy their spare time, since there is a constant pressure to be on call to accept potential upcoming projects (Huws, 2016).

In 20 interviews with experts, platform workers and platform providers also Schörpf et al (2017) found that platform workers were pressured by a need to be constantly available, had to have short reaction times and were inhibited by platform surveillance and anticipated consequences for their online reputation. One graphic designer reported that taking leave or going on holiday was difficult because her online profile could not be paused. She worried that temporary non-responsiveness would result in her missing out on opportunities to earn money in the short term and in the long term her online reputation would be damaged and affect her ability to attract new work in the future.

Lehdonvirta (2018, p. 23) reports that most of the 30 micro task interviewees were mentally occupied with tasks and rewards they were missing out on when they were not working and experienced complaints from family and friends that they worked too much and neglected other plans and commitments.

It appears that platform workers often work when and where they are demanded by clients. It is therefore debatable whether digital markets provide the work-life balance that is the supposed benefit of the work related platform economy.

Work intensity and stress

Since the organisational principle of platform work is its on-demand character, the successful running of a platform depends on a large pool of workers and clients to guarantee efficient matching of supply and demand. For workers, there is much local and global competition, depending on the platform, and the availability of work is highly uncertain. When tasks appear, they are usually bound to a short-term deadline, which can confer a lot of stress on workers (EU-OSHA, 2017; Huws, 2016; Maselli et al, 2016).

Platform work also encourages high-intensity work at a rapid pace without breaks. For example, Huws et al (2017) interviewed a UK Uber driver who remarked that he, and others like him, rarely stopped even for bathroom breaks.

Level of flexibility and autonomy

One of the main reasons cited by workers to engage in platform work is the flexibility it offers (Berg, 2016; De Groen and Maselli, 2016). Flexibility can be understood as the ability of the worker to select the tasks they want to do; to decide their working time (when, how often, for how long), and to decide how to do the task or organise the work process.

Autonomy is generally related to flexibility, independent decision-making and discretion in work and directly impacts working conditions (Eurofound, 2016). On the one hand, greater scope for autonomy makes workers more likely to view their jobs as meaningful and is one of the main factors associated with satisfaction with working conditions (Eurofound, 2016), and a contributing factor to workers' health (Marmot et al, 1991). However, Eurofound's European Working Conditions Survey also indicates that 'workers who have complete autonomy over their working time are more likely to indicate problems with their work-life balance' (Eurofound, 2016, p. 117).

In theory, with a functioning internet connection, the online platform worker can work wherever, whenever, for whom and on whatever tasks, for as much or little as they want. However, Lehdonvirta's (2018) interviews with 30 online micro task workers affiliated to AMT, MobileWorks and CloudFactory suggest there are structural and cognitive factors that inhibit true flexibility in this regard. The main structural factors were found to be the availability of work, and the degree of dependence on platform work earnings. Workers who were less dependent on their platform work earnings found it easier to determine for how long they would work, limited the duration of waiting time or searching for new tasks, and limited the moments when they would make themselves available to work, for example, not on Sundays or after five. For workers with platform work earnings as their main or only source of income, scheduling and time management was less under their control and much more a function of the availability of tasks and the need to earn.

With regards to deciding what tasks to accept and for how much, the availability of work as well as a workers' online reputation determine on many platforms what tasks a worker can access (Martin et al, 2016).

For online as well as local platform workers, to be profitable the worker may have to be on call also between assignments and may adjust their schedule to coincide with peak times in demand. They may be required to work at very short notice only to find that after arriving at the site, the work has gone to someone else already (for example, Uber in surge areas). Although workers formally have the 'flexibility to work during non-profitable times and on non-profitable days, they may earn significantly less if they do so' (Smith and Leberstein, 2015, p. 6).

Furthermore, as their activities are coordinated through the platform, algorithms can exert much control over workers' schedules and work processes. For example, when it comes to deciding what tasks to accept or decline, in personal transport, passenger assignment through algorithmic systems inhibits the autonomy of workers (Lee et al, 2015; Rosenblat and Stark, 2015, 2016). In principle, drivers have about 15 seconds to accept or refuse a request based on no information. At this stage drivers do not know where the client is at that moment (so, how long it will take to pick them up), nor can they see the final destination, or what they are expected to earn. However, drivers risk being suspended or removed from the system if they consequently cancel unprofitable rides (both in Uber and Lyft) (Rosenblat and Stark, 2016). In San Francisco, Uber requires drivers to maintain cancellation rates below 5% and an acceptance rate of at least 90%.

In terms of decision-making latitude in organising a work schedule, Uber uses predictive scheduling to anticipate surges in demand and shares this information with drivers to convince them to keep working when they attempt to log off (Rosenblat and Stark, 2015, pp. 8–10). Furthermore, it uses surge pricing as 'an instrument to exert power' over workers (Newlands et al, 2017). Price changes are fickle as they can change up to 20 times an hour (Diakopolous, 2015) and given that 'the attendant rates are likewise erratic and unreliable, they evoke a great deal of uncertainty and frustration among drivers who constantly have to negotiate whether or not it makes economic sense to respond to such prompts' (van Doorn, 2017, p. 903). The decision to work, or not work, is formally up to the driver, but Uber's algorithm, ratings and rewards system are aimed at exerting control over the worker and the quality of services provided by drivers (De Stefano, 2017).

Social and professional isolation

Interpersonal contact is an important factor in how people experience their working lives. As platform work is not tied to one specific location and for the most part takes place in inconsistent work relationships (Wilde, 2016), or even without face to face interaction, this may result in workers' social and professional isolation (Durward et al, 2016; EUROGIP, 2016). In particular online platform workers, but also home repair and cleaning workers have a low level of social interaction among themselves, which can cause social isolation (Schmidt and Kathmann, 2017).

Professional isolation can occur when platform workers, even when working for a company, are not integrated in the organisation and work on separate tasks without taking part in the overall work process. As such, they have no access to informal information and may run more risk of being out of tune with the team or the atmosphere of the organisation, as their 'lack of social contact may lead to a lack of opportunity in developing social/soft skills (like team work or tolerance), an increasingly negative tone of communication, including assertive or hostile language and an increased sense of depersonalisation' (Blohm et al, 2016, p. 125). For instance, an interviewed software developer active on a platform indicated that although he had been working consistently for a single client, the client was relatively guarded about the project, and as a result, the worker had no sense of what his portion of the work was contributing to (Lehdonvirta, 2018).

For creative platform workers, it is important to create a personal connection with the client and to come across as friendly, attentive, service-oriented, but also as innovative thinkers able to provide unique ideas. The display of a winning personality may be almost as important as the results. The working conditions are therefore comparatively emotionally charged and the frustration is high if, despite the high level of engagement, the success rate is low (Schmidt, 2017).

Remuneration

As mentioned earlier on, platform work currently infrequently constitutes the main income source for platform workers in Europe. Available data for Denmark, for example, show that 61% of the respondents who made money through a labour platform within the past 12 months before the survey have earned less than DKK 25,000 (€3,330) before tax and 64% have earned less than DKK 50,000 (€6,660) before tax (Ilsøe and Madsen, 2017).

The level of remuneration varies across different types of platform work. Historically, in manufacturing and other sectors, 'piece workers' have earned less per hour than workers who were paid hourly wages (Alkhatib et al, 2017, p. 3), and so it is now with online micro task workers (Berg, 2016). Project-based tasks and locally delivered services tend to be compensated at market prices (Eurofound, 2015; Schenk and Guittar, 2010). However, as platform workers are often in arrangements which do not specify a guaranteed volume of work, sometimes equated with zero-hours contracts (De Stefano, 2017), overall earnings may be low even when tasks or projects are relatively well paid. On platforms that mediate online services, workers compete with others across the world, which brings down prices especially for low-skilled tasks, such as conducted through CrowdFlower and Amazon Mechanical Turk. Tasks requiring more specialised skills appear less at risk of a race to the bottom in prices in the global sphere, such as platform Axiom for legal advice (Schmid-Drüner, 2016; Schmidt, 2017). For locally delivered services, a more limited pool of available labour should theoretically ensure that workers earn more (Aloisi, 2015; De Groen and Maselli, 2016; Degryse, 2016). This is supported by data from the UK. BEIS (2018a), commissioned by the UK government, reports that 87% of gig economy workers earned less than £10,000 (€11,380) in the last 12 months. The researchers calculated the estimated mean income from the gig economy was £5,634 (about €6,400). However, this is skewed by a relatively small proportion of high earners. The median gig economy income is £375 (€427). 25% of platform workers earn an hourly income of less than £7.50 (€8.55) (note that the national minimum wage rate for over-25s was £7.50 from April 2017). Hourly wages varied depending on the

type of gig work the respondent was engaged in. Overall, those providing courier services earned the highest levels of hourly income from their work with 32% earning £13 per hour and above.

Box 5. The practice of tipping

Online payment has replaced cash exchange, thereby reducing the courier's or driver's opportunity see wages topped up with tips (Schmid-Drüner, 2016). Tipping practices have been a source of contention between Uber drivers and the company, as for a long time, the organisation forbade drivers from accepting cash tips. On 20 June 2017, the news agency Reuters announced that Uber reversed its policy in several major cities in the U.S. and would now allow drivers to be tipped (Somerville, 2017). Passengers are informed by Uber's updated FAQ as follows: 'Tipping is voluntary. Tips are not included in the fare, nor are they expected or required. As a rider, you are not obligated to offer your driver a gratuity in cash. If you decide you would like to tip, your driver is welcome to accept[8].

Platform workers are often not paid for time spent not working, such as time spent looking for a new assignment, or waiting time (Berg, 2016; Hill, 2015a; McKinsey, 2016). Activities and pay are neither continuous, nor guaranteed, often resulting in low overall earnings, much income variability and low job stability (Berg, 2016; Blohm et al, 2014; Durward et al, 2016).

Online contest platforms

Eurofound (2015) reports that workers on the Czech platform Topdesigner are paid on average €200 for small scale projects. In comparison, payments for contests launched through the Danish platform Bobl which matches creative workers to brands, range from about €2,000 to €20,000, with an average of around €6,000 (Eurofound, 2015, p. 115).

A study of the design platform CoContest (now GoPillar) found that Italian workers received 30% lower remuneration on the design platform than designers receive for delivering the same service in the Italian local market (Maselli and Fabo, 2015). It only makes sense to participate in such contests if designers have little experience and the labour market entry barriers are high, or when flexibility is a decisive factor for personal reasons.

Conversely, Serbian participants on GoPillar received on average €69 per submission, which was three times higher than on the Serbian local market (Maselli and Fabo, 2015, pp. 10–12).

Online micro tasks

Ipeirotis' (2010) web crawled data on AMT showed that 90% of micro tasks, such as tagging photos or labelling categories, paid less than 10 cents (€0.09). As remuneration is set by the client, there is much variation in pay per task, and consequently, in workers' average hourly wages, which depend on the availability of work and how long it takes them to complete a task.

Berg's (2016) survey of Indian and U.S. Amazon Mechanical Turk workers found that on average, U.S. workers earned $5.55 (€4.70) per hour, compared with $3.20 (€2.60) for Indian AMT workers. Further, only 10% of Indian and U.S. AMT workers reported earning hourly wages above $10 (€8.50) (Berg, 2016, pp. 11-12). Berg's survey of 363 globally-based CrowdFlower workers found a self-reported average of $1.77 (€1.40) per hour. Additionally, workers reported spending time searching for, preparing and organising their work which

[8] Uber's updated FAQ could be found on their web site: https://help.uber.com/h/8459a496-5ed2-4f9d-b15c-d8afd9ccf34f (last visited 6 October 2017).

went unremunerated. According to Berg (2016, p. 11), for every hour of paid work, workers spent 18 minutes searching for work and undertaking preparatory work.

A survey of platform workers in Germany found that micro task workers spent less than 10 working hours per week and earned on average €144 per month. 97% of respondents made less than €500 per month (Leimeister et al, 2016, p. 45). Further, it is estimated that a worker can make between €200-400 per month for around 30 hours of work on the microwork translation and survey platform Clickworker in Germany (Eurofound, 2015).

Online professional tasks

Remuneration is generally higher on platforms trading high skill or complex online services. For example, average hourly wages on Upwork are estimated as $16 (€13.64) in software, $8 (€6.82) for writing and translation, $4 (€3.41) for administrative support, and $5 (€4.26) for both customer support and sales and marketing (Codagnone et al, 2016a, p. 36).

Leimeister et al's (2016) survey of 36 German micro taskers, 43 testers and 34 design platform workers showed that for design platforms, working hours were found to be considerably longer than on micro task platforms, averaging 30 hours per week and earning about €660 per month (Leimeister et al, 2016, p. 51). A calculated hourly rate based on the averages would come out at around €7.30. It is important to note that averages do not reflect the diversity of the findings and should be interpreted cautiously.

Similarly, for Bulgaria, Yordanova and Kirov (2017) find that the income of platform workers involved in qualified work (for example, ICT) is very decent.

Locally delivered tasks

Uber drivers in the U.S. receive $6 (€5.11) per hour more than drivers of traditional taxis ($19 (€16.19) versus $13 (€11.08)) (Harris and Krueger, 2015, p. 23). However, investigative journalism revealed that non-working time was not remunerated and when waiting time and running costs of U.S. Uber drivers were taken into account, estimates of net per hour earnings were similar to, or below, federal minimum wage (Walsh, 2015). These findings were corroborated by Zoepf et al's (2018) survey conducted among 1,100 Uber and Lyft drivers in the U.S. The drivers' self-reported revenue, mileage and choice of vehicle were compared with estimates of operational costs including insurance, maintenance, repairs, fuel and depreciation. The study estimated that the median hourly pre-tax profit from driving was $3.37, and 74% of drivers earned less than the federal minimum wage in their state. Further, 30% of drivers lost money once vehicle expenses were included.

In a comparison of Uber in the U.S. and the Belgian ListMinut (household services), gross earnings were found to vary between an average of €17.2 per hour for Uber drivers and €15.4 for ListMinut workers (De Groen et al, 2016). The higher earnings for Uber drivers may result from the cost of service provision (car ownership), whereas ListMinut services may be performed at little cost. In Slovenia in 2015, a survey was conducted among 64 drivers of the GoOpti platform on the level of satisfaction with their pay and found that 37% of drivers were dissatisfied with the pay, compared with 28% of drivers who indicated they were satisfied (Omerza, 2016, p. 124).

Some platforms have made a public commitment to fair pay. For example, since 2014, TaskRabbit has set a minimum hourly rate for workers in the U.S., which at $12.80 (€10.90) per hour is higher than most minimum wage standards across U.S. states (Codagnone et al, 2016a; Dwoskin, 2014).

Box 6. Anecdotal evidence on earning a living through platform work

The Central Organisation of Finnish Trade Unions (Suomen Ammattiliittojen Keskusjärjestö, SAK) in cooperation with the Finnish Institute of Occupational Health (FIOH) conducted interviews with four bike couriers. It was found that a courier may reach a 'minimum living income' by working six days a week. The income does not allow a worker to save, take

holidays, or repay loans, and the courier is responsible for the costs of procurement and maintenance of their required equipment. There is competition for assignments, and the couriers' individual 'performance categorisation' defines which shifts they will be allocated. The courier application continuously collects data on the deliveries (speed, chosen routes etc.), based on which a courier 'team leader' gives the courier weekly feedback. In addition, the clients rate their satisfaction with the service, but it is unclear whether this affects the worker's rating.

Source: National contribution to Eurofound's information collection on platform work (2018)

Job security

Low job security is known to contribute to ill-health among contingent workers (EU-OSHA, 2017, p. 27) and could be salient for platform workers (Tran and Sokas, 2017). The often short duration of tasks, the surges and falls in demand (Smith and Leberstein, 2015), the lack of guaranteed minimum pay, and competition produce low security for workers. Findings from the 2016 partnered survey of approximately 6,000 freelancers by Upwork and the Freelancers Union in the U.S. indicated that 26% of full-time freelancers listed income stability as their top most concern, compared with 19% of part-time freelancers (Upwork and Freelancers Union, 2016). This indicates that workers whose main income depends on their platform work earnings are more concerned about income variability than those who are less dependent on those earnings for their total income.

Even when engaged in a task or project, workers are looking for the next one, never certain if work will keep coming, what the work will consist of and how, or when it will be paid (EU-OSHA, 2017). Many workers report wanting to work more, this produces stress (Berg, 2016; EU-OSHA, 2017).

Also, the work relationship as set by the terms and conditions of the platform may be discontinued without notice or explanation (Codagnone et al, 2016b; EU-OSHA, 2017; Huws et al, 2017; Rosenblat et al, 2017). This is a 'pro-active' strategy employed by platforms that is aimed at enforcing immunity of both the client and the platform, by protecting them from, among others, liability and the obligations of an employment relationship (EU-OSHA, 2017, p. 14). Furthermore, platforms reserve for themselves the right to change the terms of service at any time, which as van Doorn states,

> *renders the contractual relation that governs workers' conduct highly insecure and detracts from their ability to appeal particular regulations or decisions. Moreover, many terms and condition agreements also give platform owners the right to terminate workers' user accounts when they decide that these workers have somehow breached the agreement, which, to reiterate, can be modified at will.*
>
> (Van Doorn, 2017, p. 902)

In interviews, platform workers have signalled that sudden changes in terms and conditions make them feel insecure; the more so because they feel at risk of being replaced should they speak out. Simultaneously, they report feeling that their opinion does not matter for the platform for which they work (Huws et al, 2017, p. 42). All together, the income volatility, uncertainty over work availability and powerlessness in the face of changing terms of use, as well as the lifecycles of platforms make platform work a highly contingent form of work.

Data protection and privacy

Concerns about data protection may inhibit some workers from engaging in platform work (Mandl and Curtarelli, 2017). Companies and platforms operating in the EU, or that handle data of EU citizens, are subject to the EU Data Protection Directive (European Parliament, 1995), which will be replaced by the General Data Protection Regulation (GDPR) from May

2018 onwards (European Union, 2016). This regulation stipulates how personal data are to be stored, shared and handled. Through their matching and brokering activities, platforms handle a lot of their users' personal data (location, payment details, address and personal details such as age and educational background). Additionally, behavioural data, such as the number of clicks on a page or shares and likes, may be tracked, analysed and used for internal purposes or sold to third parties (van der Graaf and Fisher, 2017). Data of this nature are very valuable for companies when it comes to anticipating customer behaviour to stay ahead of competitors, and for advertisement reasons. What is at stake in personal data protection mechanisms is not only what data is collected, but for how long it is stored, by whom it is used and for what purpose. Platforms in their capacity as data handlers are obliged to implement some form of data protection mechanisms that include policies on user privacy and security. Some notable complaints on data handling by platforms have been registered by clients and workers on social media. Concerns have been brought to the court by individuals, see for example Gonzales vs. Uber, 2017 (Dickey, 2017). Also, the U.S. news agency CNBC reports that campaigners and privacy advocates have appealed to institutions such as the Federal Trade Office (U.S.) to take action. An example of a complaint involves an update to Uber's app in November 2016 that limited clients' control of the platform's data collection on their location. They had to choose between allowing the app to gather location data always or never. When selecting 'never', the functionality of the app was impaired (Gibbs, 2017). In the first instance, this may appear to make sense as a driver cannot know where to pick up a client if the location is not specified. However, Uber used the localisation function of the app to track users after their trip had ended. After pushback from clients and the media, Uber announced on 29 August 2017 that it would stop tracking users beyond their trip. It is uncertain when this decision takes effect (Gibbs, 2017).

Information provision and exchange

Several studies touch on asymmetries of information between workers, clients and platforms, as well as power asymmetries in favour of platforms (Codagnone et al, 2016a; Eurofound, 2015; Felstiner, 2011; Schmid-Drüner, 2016). AMT is often used as an example of a platform where different levels of access to information results in clients having access to significantly more information on workers than the other way around. The platform tracks and maintains workers' acceptance rates, so that clients can recruit workers who have higher rates of task acceptance from prior requests. However, there is no equal mechanism for workers to filter clients. Workers only see the name the client chooses to use, which means they have no information about the client that could help them assess whether they are reliable, prompt payers, respectful, or how they communicate. On the one hand, anonymity of this kind may reduce the risk of discrimination within the hiring process, for example against certain genders, ethnicities or against people with disabilities (ILO, 2016b). However, higher levels of anonymity may also reduce accountability between online parties, which may foster 'bad' behaviours such as putting in minimal effort (from the workers' side) and arbitrarily foregoing payment (from the client's side) (Irani, 2015).

Furthermore, often advertised assignments on micro task platforms are not well described (Codagnone et al, 2016b; Eurofound, 2015) and it is laborious and time consuming for the worker to contact the client for additional instructions. However, if they do not ask for clarification they are at risk of performing work that displeases the client, who may refuse payment (Schmid-Drüner, 2016, p. 15). Unspecified or badly specified tasks also have other risks. AMT workers must teach themselves or each other through channels other than the platform to identify illegitimate tasks to stay safe online. The lack of transparency raises ethical questions as workers are unable to make judgments about the moral valence of their work, for example when micro tasks involve content moderation and workers may be confronted with disturbing content (Blohm et al, 2016; Roberts, 2016).

However, other platforms such as Upwork stimulate clients to present as much specific information in the project or task advertisement as they are comfortable with, providing

clients with guidance on the type of information that would be appropriate in the advertisement[9].

Another example of information asymmetry can be found with the creative platform 99designs. The platform takes a fee of 35% to 50% of the total transaction, splitting the fee between the client and the designer but without disclosing to either what the other person pays. The terms and conditions also state that when a designer finds a new client through a contest, all future communication with that client and all future commissions must run through the platform, which will continue to charge a fee on transactions. The only way out for the designer is to pay an 'opt-out-fee' of $2,500 (about €2,100) to the platform. This hardly seems enforceable, but the threat of legal action may deter some from pursuing direct contact with a worker or client. Schmidt (2017) states:

> *This example shows how platforms use the structural power asymmetry to take advantage of the platform workers. The latter have a chance of 1 in 100 to 'win' a payment of 250 euros for work that they have custom-made in advance for the client. They carry all the legal risks and on top of that have to accept an opt-out fee that is about a thousand times higher than the average exchange value for the design that they upload. The opportunities and risks on the largest platform for contest-based creative crowdwork are very unevenly distributed, and 99designs is not an exception.*
>
> (Schmidt, 2017, p. 18)

Skills development and work content

Platform workers generally do not have access to HR measures, mentoring or coaching and they must organise their professional development themselves (Eurofound, 2015, p. 115). However, platform work potentially provides opportunities for skills development, through means other than conventional forms of training or education. The entry barriers to platform work are relatively low and people outside conventional career paths may find opportunities to learn new skills by doing (Barnes et al, 2014; Eurofound, 2015; Graham et al, 2017; Kuek et al, 2015; Schmidt, 2017). For example, Barnes et al (2015) interviewed 12 platform workers on two unnamed UK-based online freelancing platforms who used existing skills and labour market experiences to attract work through the platform. Furthermore, they developed new skills that were in some cases unrelated to their previous labour market experience. They used platforms as a method to 'broaden skills and expertise, or for changing career' (Barnes et al, 2015, p. 23).

Opportunities to learn and develop new skills depend on the activities within a given type of platform work. Not all tasks are personally rewarding nor does performing the tasks lead to skills development (Barnes et al, 2015; Eurofound, 2015; Irani, 2015). Standardised small tasks as opposed to complex, larger projects, offer little skills variety and do not provide the 'task identity and task significance' that enable workers to find meaning in their working lives (Kittur et al, 2013, p. 1311). For example, while 60% of the respondents (drivers) to a survey on the Slovenian platform GoOpti reported to be (very) satisfied with the opportunities for education and training, only 37% mentioned to be satisfied with their career opportunities, compared to 33% who were dissatisfied (Omerza, 2016, p. 124).

The work content of micro tasks has been compared to 'labour on a conveyor belt' (Schmidt, 2017, p. 17) and 'deskilled tasks' as the very process of breaking projects down into small tasks ensures there is little to no skills requirement (Kässi and Lehdonvirta, 2016, p. 2). There may be cases in which platform work leads to deskilling (Blohm et al, 2016; European Commission, 2015; Graham et al, 2017). Through semi-structured interviews with 125 online

[9] Furthermore, Upwork has published a number of manuals and guidelines for clients to help them advertise jobs to increase their chances of finding the best match and provides suggestions for interview questions specific to certain job categories.

workers conducted in cities in the Philippines, Malaysia, Vietnam, South Africa, Kenya and Nigeria between September 2014 and October 2015, Graham et al (2017) found that many tasks performed by platform workers did not match their skills or qualifications, which was considered frustrating and unrewarding. Furthermore, even if skills are acquired or work experience gained through micro tasking, this is often not transferable to other contexts. Also, the lack of face-to-face interaction or participation on shared activities does not lend itself to building a professional identity, which impacts both the current and prospective careers of workers (Valenduc and Vendramin, 2016).

Alternatively, platforms such as 99designs or Jovoto through which clients can commission creative work are experienced as intrinsically rewarding by platform workers (Teodoro et al, 2014). Participation may offer low-barrier entry into the creative industries and allow new entrants to practice and develop their creative skillset, perhaps 'driven by the hope of entering a fulfilling line of work, or learning skills with value outside the platform' (Schmidt, 2017, p. 17). Independent of whether such work experience is formally recognised, workers practice and develop skills that may serve them outside the platform (Graham et al, 2017).

In short: Main findings from literature on platform workers' working conditions

Considering the perceived dominance of working conditions of platform work in public and policy debate, surprisingly few research studies deal with the issue, and a very limited number of publications does so with a comprehensive approach (exploring a wider set of working conditions elements).

The working conditions element that is most commonly discussed in extant literature refers to income. Authors generally flag the variability and unpredictability of earnings. Micro tasks seem to be related to low earnings while higher skilled online tasks and locally delivered tasks are found to result in decent earnings.

Another often explored indicator is working time and work-life balance. Overall, research finds rather limited number of working hours per platform workers – with the exception of those who do it as their main job (resulting then in long working hours). Some authors pinpoint the occurrence of anti-social working hours and unpaid time (waiting periods, searching and bidding for tasks). This influences work-life balance, as does the perception to be required to be always available. Somewhat related to this more 'social aspect' of platform work, a few authors analyse the social and professional isolation of platform workers and generally find limited personal and professional interaction opportunities for platform workers.

As regards flexibility, autonomy and control, the majority of available information points towards good potential for platform work, as it is – at least in theory – up to the workers to decide for which tasks to offer, and if successful, when, where and how to realise the task. Im practice, research finds some limitations imposed by the availability of work and platforms' terms and conditions (including ratings and algorithmic task assignment). A generally perceived low level of job security is somewhat related to the often promoted aspect of flexibility.

The perceived meaningfulness of platform work seems to vary considerably with the type of tasks. While standardised, low skilled and micro tasks are widely considered as 'work on a conveyor belt', and might result in frustration not at least due to platform workers being overskilled for the tasks, creative and professional platform work is deemed intrinsically motivating. In line with that, authors detect both the potential of platform work to contribute to deskilling and opportunities for learning on-the-job.

From a health perspective, a few publications pinpoint higher health and safety risks for platform workers, notably those delivering their services locally. Furthermore, it is indicated that the often experienced high work intensity caused by short deadlines results in insufficient breaks, exhaustion and stress for the workers.

Other working conditions elements discussed refer to issues related to data protection, privacy and information transparency. However, they are, so far, explored rather theoretically, with no specific findings on the affected workforce.

Table 12: Summary of the main literature on platform workers' working conditions

Source	Health and safety	Working time, work-life balance	Work intensity and stress	Flexibility, autonomy, control	Social and professional isolation	Income	Job security	Skills development	Meaningfulness of work
Aloisi, 2015	n.a.	n.a.	n.a.	n.a.	n.a.	For locally delivered services, the limited labour pool should theoretically ensure that workers earn more	n.a.	n.a.	n.a.
Balaram et al, 2017	n.a.	About 50% of UK gig workers do not work every month, 24% work every week 80% of gig workers work up to 16 hours per week	n.a.	63% of UK gig workers agree that the work provided more freedom and control	n.a.	n.a.	n.a.	n.a.	n.a.
Barnes et al, 2014	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	Opportunity for learning	n.a.

								by doing	
BEIS, 2018a	n.a.	n.a.	n.a.	n.a.	n.a.	25% of UK platform workers earn less than the national minimum hourly rate; about one third of platform couriers earn almost twice the national minimum hourly rate 87% earn less than about €11,400 per year	n.a.	n.a.	n.a.
Berg, 2016	n.a.	n.a.	n.a.	n.a.	n.a.	High income variability Lower rates for online micro tasks compared to	n.a.	n.a.	n.a.

						'traditional' hourly rates (€4.7 average hourly earnings for U.S., € 3.2 for Indian workers) Time spent for looking for an assignment not paid (18 minutes for every hours of paid work)			
Blohm et al, 2016	n.a.	n.a.	n.a.	n.a.	Higher risk of non-integration in a team, resulting in lacking opportunities to develop social and communicatio n skills	n.a.	n.a.	Potential of deskilling	n.a.
CIPD, 2017	n.a.	n.a.	n.a.	47% of the UK	n.a.	n.a.	n.a.	n.a.	n.a.

				gig workers do not feel like their own boss (49% of those providing transport services, 31% of those involved in delivery of food or goods)					
Cockayne, 2016	n.a.	n.a.	n.a.	Ratings impose discipline and specific behaviour on platform workers	n.a.	n.a.	n.a.	n.a.	n.a.
Codagnone et al, 2016a	n.a.	n.a.	n.a.	n.a.	n.a.	Around €3-14 average hourly wage for online professional tasks Minimum hourly wage	low	n.a.	n.a.

						for U.S. workers on a platform for locally delivered services €10.9 (higher than most U.S. minimum wage standards)			
Degryse, 2016	n.a.	n.a.	n.a.	n.a.	n.a.	For locally delivered services, the limited labour pool should theoretically ensure that workers earn more	n.a.	n.a.	n.a.
De Groen and Maselli, 2016	n.a.	Low number of working hours in platform work	n.a.	n.a.	n.a.	For locally delivered services, the limited labour pool should theoretically ensure that workers earn more	n.a.	n.a.	n.a.

De Groen et al, 2016	n.a.	n.a.	n.a.	n.a.	n.a.	Hourly gross earnings of €17.2 for U.S. Uber drivers and €15.4 for Belgian platform workers locally delivering services	n.a.	n.a.	n.a.
DG IPOL, 2017	n.a.	Long (unpaid) search time Anti-social working hours	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Durward et al, 2016	n.a.	n.a.	n.a.	n.a.	Social and professional isolation	n.a.	n.a.	n.a.	n.a.
EU-OSHA, 2017	higher incidence of work-related injuries for locally delivered tasks	n.a.	Short deadlines cause stress	n.a.	n.a.	n.a.	low	n.a.	n.a.
EUROGIP, 2016	n.a.	n.a.	n.a.	n.a.	Social and professional	n.a.	n.a.	n.a.	n.a.

					isolation				
European Commission, 2015	n.a.	Perception to be required to be always available Blurring boundary between private and professional live	n.a.	n.a.	n.a.	n.a.	n.a.	Potential of deskilling	n.a.
Maselli and Fabo, 2015	n.a.	n.a.	n.a.	n.a.	n.a.	Italian online contest platform workers earn 30% less and Serbian ones earn 3x more than in the local market	n.a.	n.a.	n.a.
Graham et al, 2017	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	Opportunity for learning by doing, but also potential of deskilling	Skills mismatch results in frustration
Harris and Krueger, 2015	n.a.	n.a.	n.a.	n.a.	n.a.	U.S. Uber drivers earn about €5 per	n.a.	n.a.	n.a.

						hour more than traditional taxi drivers			
Hill, 2015a	n.a.	n.a.	n.a.	n.a.	n.a.	Time spent for looking for an assignment not paid	n.a.	n.a.	n.a.
Huws, 2016	Lack of knowledge on regulations, lack of safety equipment, higher OSH risks due to insufficient breaks, interruptions, distraction, exhaustion Visual fatigue and muscoskeletal problems in platform	Perception to be required to be always available	Short deadlines cause stress	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

	work								
Huws et al, 2017	Physical and sexual assaults on platform work taxi drivers	Long working hours Long and unpredictable waiting time	High work intensity contributes to psychosocial and physical disorders	n.a.	n.a.	n.a.	low	n.a.	n.a.
ILO, 2016b	n.a.	Long working hours for those depending on platform work	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Ilsøe and Madsen, 2017	n.a.	Few, if any, work full-time via a platform	n.a.	n.a.	n.a.	61% of Danish platform workers earn less than about €3,300 and 64% less than about €6,700 per year	n.a.	n.a.	n.a.
Ipeirotis, 2010	n.a.	n.a.	n.a.	n.a.	n.a.	90% of online micro tasks pay less than €0.09 High variation of workers'	n.a.	n.a.	n.a.

						average hourly wages			
Jiang et al, 2015	n.a.	Perception to be required to be always available	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Kittur et al, 2013	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	Limited for standardised small tasks
Kuek et al, 2015	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	Opportunity for learning by doing	n.a.
Lee et al, 2015	n.a.	n.a.	n.a.	Decision on tasks limited in case of algorithmic assignment	n.a.	n.a.	n.a.	n.a.	n.a.
Lehdonvirta, 2018	n.a.	Neglecting private plans and commitments	n.a.	Influenced by the availability of work and dependency on platform work (micro tasks)	Lack of opportunity to see the 'bigger picture' to which the tasks contributes	n.a.	n.a.	n.a.	n.a.
Leimeister et al, 2016	n.a.	n.a.	n.a.	n.a.	n.a.	97% of online micro taskers	n.a.	n.a.	n.a.

						earn less than €500 per month Average monthly income of German design platform workers is €660			
Martin et al, 2016	n.a.	Perception to be required to be always available Blurring boundary between private and professional live	n.a.	Influenced by the availability of work and workers' online reputation	n.a.	n.a.	n.a.	n.a.	n.a.
Maselli et al, 2016	n.a.	n.a.	Short deadlines cause stress	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
McKinsey, 2016	n.a.	n.a.	n.a.	n.a.	n.a.	Time spent for looking for an	n.a.	n.a.	n.a.

						assignment not paid			
Omerza, 2016	n.a.	n.a.	n.a.	n.a.	n.a.	37% of platform drivers are dissatisfied with their payment, 28% are satisfied	n.a.	60% of platform drivers are (very) satisfied with their opportunities for education and training	37% of platform drivers are satisfied with career opportunities, 33% are unsatisfied
Rosenblat and Stark, 2015, 2016	n.a.	n.a.	n.a.	Decision on tasks limited in case of algorithmic assignment	n.a.	n.a.	n.a.	n.a.	n.a.
Rosenblat et al, 2017	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	low	n.a.	n.a.
Schmid-Drüner, 2016	n.a.	n.a.	n.a.	n.a.	n.a.	Tasks requiring more specialised skills are less at risk of low prices	n.a.	n.a.	n.a.
Schmidt, 2017	n.a.	n.a.	n.a.	n.a.	Emotional strain for creative	Tasks requiring more	n.a.	Opportunity for learning by doing	Micro tasks perceived as 'labour on a

					platform workers	specialised skills are less at risk of low prices			conveyor belt’
Schmidt and Kathmann, 2017	n.a.	n.a.	n.a.	n.a.	Particularly for platform workers and those in household/domestic tasks	n.a.	n.a.	n.a.	n.a.
Schörpf et al, 2017	n.a.	Perception to be required to be always available	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Smith and Leberstein, 2015	n.a.	Perception to be required to be always available Blurring boundary between private and professional live	n.a.	Affects income levels	n.a.	n.a.	low	n.a.	n.a.
Statistics Denmark, 2017	n.a.	Many platform workers work less than	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

		seven hours per week on a platform							
Teodoro et al, 2014	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	Creative platform work is intrinsically rewarding
Tran and Sokas, 2017	Higher risks due to non-designated work environments, high work intensity, insufficient breaks	n.a.	n.a.	n.a.	n.a.	n.a.	low	n.a.	n.a.
Upwork and Freelancers Union, 2016	n.a.	n.a.	n.a.	n.a.	n.a.	19% of part-time and 26% of full-time platform workers conducting online professional tasks are concerned about income variability	n.a.	n.a.	n.a.

van Doorn, 2017	n.a.	n.a.	n.a.	Ratings push workers to self-optimise	n.a.	n.a.	low	n.a.	n.a.
Wilde, 2016	n.a.	Long working hours for those depending on platform work	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Yordanova and Kirov, 2017	n.a.	n.a.	n.a.	n.a.	n.a.	income of platform workers involved in qualified work is very decent	n.a.	n.a.	n.a.
Zoepf et al, 2018	n.a.	n.a.	n.a.	n.a.	n.a.	Median profit of U.S. Uber and Lyft drivers was $3.37 pre-tax; median driver revenue is $0.59 per mile ($0.29 with operating costs)			

n.a. – no information available

Source: own compilation

Employment regulation and platform workers

Regulatory issues surrounding platform work have received increasing attention from national and supranational authorities and in the academic literature, particularly focussing on the applicability of the legal concept of the traditional employment relationship (Aloisi, 2015; Berg, 2016; Blanpain et al, 2016; EU-OSHA, 2017; ILO, 2016a; Donovan et al, 2016; Felstiner, 2011; Hill, 2015a; Huws, 2014; Prassl and Risak, 2016, 2017; Risak, 2016; Waas et al, 2017).

Employment status of platform workers

Traditionally, the legal concepts of 'employer', 'employee' and 'the employment relationship' have been used to define the scope of labour law, differentiating between employees (subordinate and dependent workers) and independent contractors (Countouris, 2007; Fudge, 2006; Harris and Krueger, 2015; Waas et al, 2017; Waas and van Voss, 2017). The different forms of platform work and the different legal interpretations of employment relationships across national contexts make it difficult for regulators to determine where platform workers fit in established labour market concepts (Waas et al, 2017). Some arrangements can be understood as a multi-employer arrangement or as a triangular relationship between worker, client and platform (Waas et al, 2017, p. 143). Platform workers can share some characteristics with the employee category and some with the category of independent contractor/self-employed, depending on the type of platform work, the tasks performed and the platform. However, the legal reality of the relationship is often determined by the platform's terms and conditions, which commonly deny the existence of an employment relationship between the platform and the worker, and between worker and client (Donovan et al, 2016). Workers are then designated independent contractors, and thus self-employed. As such, they fall outside the scope of EU labour law and are in many countries not, or only partially, covered by the Written Statement Directive.

Table 13: Coverage of platform workers under the Written Statement Directive, 2017

Complete coverage	Partial coverage	No coverage
BE, CY, FI, DE, ES	BG, HR, CZ, DE, EE, EL, IE, IT, MT, NL, PT, RO, SK	AT, FR, HU, LT, LV, LU, PL, SL, SE, UK

Source: European Commission, 2017a, p. 11.

However, within the framework of the European Pillar of Social Rights, in 2017 the European Commission proposed an important revision of the Written Statement Directive (Directive 91/533/EEC) which would expressly include platform workers in the legal definition of a 'worker' (Risak, 2017, p. 15).

As an example of terms and conditions that determine the legal relationship, Amazon Mechanical Turk includes in its terms of use:

> *'As a Provider you are performing Services for a Requester in your personal capacity as an independent contractor and not as an employee of the Requester'*
>
> (Mturk, 2017)

Interestingly, the emphasis rests on denying an employment relationship between worker and client, whereas Upwork's terms of use emphasise the denial of an employment relationship between worker and the platform:

> *'You acknowledge and agree that Upwork is not a party to any Service Contracts, and that the formation of a Service Contract between Users will not, under any circumstance, create an employment or other service relationship between Upwork and any freelancer'*

(Upwork, 2016, para. 5.1)

The terms of use conclude with a stand-alone paragraph that sets out employee characteristics that Upwork finds specifically inapplicable to the relationship between workers and the platform. It states that Upwork does not 'supervise, direct, or control Freelancer or Freelancer's work', nor does Upwork 'set Freelancer's work hours, work schedules, or location of work', and mentions that tool ownership and premise of work is strictly the responsibility of the workers (Upwork, 2016, para. 10).

Once workers agree to the terms of use, through signing or through continued use of the platform, this sets the 'legal reality' of the relationship. However, the 'factual reality' may differ (Countouris, 2007), resulting in some first court procedures to investigate such.

For example, bike couriers for food delivery app Deliveroo in Belgium and the Netherlands were previously employees of the company, but in January 2018, Deliveroo refused to extend riders' contracts and will now only work with bike couriers who are registered as self-employed (Bhagwat, 2018). Dutch newspapers announced a pending crowd funded court case of *Ferweda vs. Deliveroo* (van der Leeuw, 2018)

Clarifying the status of platform workers

There are increasing concerns that the legal designation as independent contractor for platform workers does not match the factual reality of workers' relationship with, and dependence on, a given platform or client (DG IPOL, 2017). Generally, independent contractors have access to fewer protections and social security options than employees, which means that as platform work continues to grow, an increasing number of workers may be left without access to entitlements and benefits (Codagnone et al, 2018; European Commission, 2018).

The European Commission's (2016a) Agenda for the Collaborative Economy sets out three criteria that can be used across European countries and jurisprudence to determine on a case-by-case basis the factual employment relationship of the platform worker with the platform and/or client:

The existence of a subordination link. While interpreted differently across countries, this criterion is nonetheless considered by all as a key characteristic of employment relationships. Subordination identifies 'the employee's duty to comply with the employer's power of instruction' (Waas and van Voss, 2017: xliv). In the context of platform work, the subordination characteristic identifies to what degree the worker is controlled by the platform or the client, for example in setting pay, working hours, and determining the manner in which the work is performed, for example when client or platform include instructions for the way in which activities are undertaken or delivered (European Commission, 2016d). Subordination may also comprehend monitoring of the worker's activities (Todoli-Signes, 2017). Platform work often facilitates clients' monitoring of their workers through evaluation systems which makes workers' actions visible at all times (Sprague, 2015, p. 18; Todolí-Signes, 2017). By itself, the mere existence of a rating system is not a good indicator of the extent to which influence is exerted over the worker (article 14 of the e-Commerce Directive). However, extensive monitoring practices on which ratings are based may in some circumstances be a sign of a governing influence (Waas et al, 2017, p. 89) that is more far-reaching than in a lot of traditional workplace settings (Kaplan, 2015).

The nature of work is key in determining the position of the worker in the labour market. To be considered an employee, the platform worker must pursue a factual economic activity that is more than 'purely marginal and accessory' (European Commission, 2016a, pp. 12–13). What is considered marginal and accessory differs across national systems and is often determined based on time and wage thresholds, which the piece-meal structure of platform workers' labour market activities makes it difficult to qualify for (ILO, 2016b, p. 8; European Commission, 2016a, p. 13).

The presence of remuneration, which is mainly used to distinguish voluntary work from activities that are compensated. The ILO has recommended using criteria such as 'periodic remuneration' and whether the remuneration constitutes the worker's main or sole source of income (ILO, Recommendation 198, paragraph 13).

Creating a third category of employment status

There are voices (Harris and Krueger, 2015) in favour of establishing a third legal category of worker that takes on qualities of both employee and self-employed and that could serve to protect platform workers without unduly harming the potential of the platform work economy. Creating a third category can happen in two ways. The third category may constitute a hybrid status which specifies the rights and obligations of workers. Hybrid status is used already among others in Austria and Italy, which recognise 'employee-like' persons (Eurofound, 2017, Waas et al, 2017; Waas and van Voss, 2017). This category of workers is subject to the tax rules of self-employed workers, and entitled to the social protections of employees.

Another option is to define a subcategory of economically dependent workers and adjust social protection systems to provide them with rights similar to those of employees. Member States using this option include Portugal, Slovakia, Slovenia and Spain (Eurofound, 2017).

Further, rather than creating a third category, some Member States such as Germany, Latvia and Malta have established criteria relating to workers' economic dependence on the client to determine whether a worker is self-employed or an 'employee-like' person (Eurofound, 2017).

The UK has three categories for employment rights (although only two tax categories), namely self-employed and contractors; workers, and employees (OTS, 2017). Workers are partially covered for protections such as working hours, holidays, and the national minimum wage. However, they are not protected against dismissals and have no right to redundancy pay (ILO, 2016a, p. 20). The UK government-commissioned 'Taylor Review' (Taylor, 2017) examined the possibility of introducing a 'dependent contractor' category, to extend protections to 'gig economy workers'. This follows a court case against Uber (UK) in 2015, which ruled an Uber-driver to be an employee of the app-based platform.

Judicial determination of employment relationships in the context of platform work is still in the early stages and court cases have mainly involved individuals alleging hour and wage violations (Donovan et al, 2016). In the UK, as elsewhere (see below), rulings apply to the individuals who brought the case, not to the wider workforce.

Critics of the proposal to create a third category of employment status suggest that as neither of the two existing categories apply well, a third is unlikely to solve the problem (ILO, 2016b; Prassl and Risak, 2017).

Box 7. Legal issues going beyond employment law

There are many legal and regulatory issues surrounding platform work that go beyond employment law and the status of workers. Issues include quality standards, first party and third party liability, insurance coverage, data privacy and protection, safety of products and services, dispute resolution, fraud, competition and intellectual property rights. In online tasks, workers and clients may be more vulnerable to violations of data privacy, fraud and infringement of intellectual property rights. In locally delivered tasks, workers are particularly vulnerable to occupational accidents or traffic accidents and clients may suffer theft and damage to property (Schmidt, 2017). As a result, issues of liability have received attention in the media in connection with taxi and food delivery services. Platform workers may claim to

have experience, a given skillset, or certificates and diplomas, but it is not clear who checks, or who should check, whether workers actually possess the credentials they claim to have (EU-OSHA, 2017; Huws, 2016). Workers on Upwork or AMT are not required to submit copies of the diplomas they claim to have or certificates of training completed (Degryse, 2016, p. 48). It only matters how previous clients have rated or reviewed the platform worker. 'Some platforms, but by no means all, state that their workers are fully vetted without necessarily explaining how. The absence of such checks can lead to situations where the safety and health of the worker concerned, and of clients and members of the public, can be put at risk' (Huws, 2016). Some platforms do require background reports on participants, for example a criminal record certificate (Schmidt, 2017, p. 18), but the requirement to submit a copy of good behaviour is no guarantee that the platform reviews the material.

Role of the judiciary

The Court of Justice of the European Union has not focussed expressly on differentiating between employees and self-employed, but rather has concerned itself with the scope of EU labour law and who falls within the purview of its protection. Rulings offer such a broad interpretation of the legal concept of 'worker' that it is possible that platform workers may be included within that definition (Donini et al, 2017).

Notable cases, such as the Dutch *FNV Kunsten Informatie en Media (C-413/13)* (InfoCuria, 2014) that was escalated to the European level have further clarified that 'a worker falling within the scope of EU law is someone who cannot choose his work schedule, place and content, does not participate in business risk and is integrated into the enterprise, forming an economic unit within it' (Donini et al, 2017, p. 211).

Personal transport

Questioning the factual reality of some work relationships cannot overlook the challenges raised against Uber in several EU Member States. Most cases have challenged the legality of the company's operations as an information society service instead of a transportation service. On 4 July 2017, Advocate General Szpunar delivered an opinion on UberPOP (for unlicensed drivers) in *Uber France SAS (C-320/16),* which referred to his earlier opinion on the company's operations in Spain, and said that Member States may prohibit and punish under criminal law, UberPOP's illegal transportation activities. A 2015 Belgian case of *Taxi Radio Bruxellois NV v Uber (C-526/15),* requesting Uber to halt its activities and withdraw its app from Google and i-Tunes stores, was ruled not admissible. On 19 June 2017, a case was raised against Uber *(C-371/17)* on which there is as of yet (spring 2018) no ruling or opinion. Notable progression from court opinion to ruling occurred on 20 December 2017, in the case of *Elite Taxi v Uber Spain SL (C-434/15),* when the Court of Justice ruled that an intermediation service such as Uber 'must be regarded as being inherently linked to a transport service and, accordingly, must be classified as a service in the field of transport' (Curia, 2017).

Also, increasingly, legal challenges have emerged that focus on the employment status of Uber drivers (EurWork, 2016). For example, in June 2015, the labour inspectorate of Catalonia in Spain ruled that Uber drivers were employees. On the basis of providing drivers with smartphones (influencing the manner in which work is done), Uber's incentive system and the organisation's promise to intervene on drivers' behalf if required, the inspectorate ruled there to be a labour relationship between Uber and its drivers (EurWork, 2016). Further, in the UK on 28 October 2016, the Employment Tribunal considered the case of Mr. Aslam and Mr. Farrar versus Uber and found that the drivers should be considered 'workers' and were therefore entitled to receiving paid rest breaks and the national minimum wage (Employment Tribunal, 2016, *C-2202550/2015*). Uber appealed the decision. Following, the GMB union continued to support 68 drivers in a group claim against Uber, whereas the

original claimants, Mr. Farrar and Aslam, have pursued their case with the IWGB union. On 10 November 2017, the Employment Appeal Tribunal upheld the earlier decision and stated that when a driver had the Uber app switched on, they are legally working for the company under a worker contract (*Uber v. Aslam, Farrar, Dawson and others, UKEAT/0056/17/DA*). The ruling applies to the original 25 claimants and additionally the 43 drivers who also joined the case.

Bike couriers

In *Dewhurst v CitySprint UK Ltd (ET-2202512/2016),* the Employment Tribunal judged that the bike courier Ms. Dewhurst was a worker of CitySprint instead of an independent contractor and was entitled two days holiday pay. Similarly, on 22 March 2017, the Employment Tribunal judged in *Mr. A. Boxer v Excel Group Services Ltd (ET-3200365/2016)* the cycle courier to be a worker of the company and entitled to holiday pay. In *Flanore v eCourrier,* the claimant and defendant reached a settlement on 11 May 2017, in which the claimant was judged to be a worker of the company.

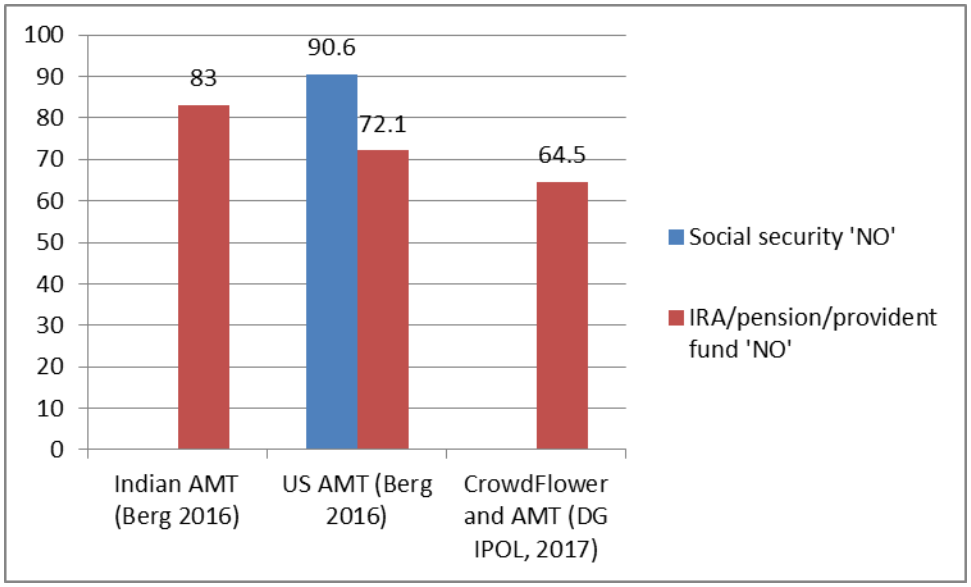
Implications for social protection

The employment status of platform workers is important, not at least as it influences their access to social protection. Expectations derived from previous research into social protection coverage for individuals in non-standard employment, such as Matsaganis et al (2015) and Spasova et al (2017), indicate platform workers may experience low levels of access to various protections. This is confirmed by several surveys of platform workers (Berg, 2016; CIPD, 2017; DG IPOL, 2017). For example, the CIPD survey found that about 33% of platform workers in the UK were not contributing into any pension plan, compared with 27% of UK employees (CIPD, 2017, p. 18). Berg's (2016) survey of 686 U.S. AMT workers in November and December 2016 found that of the 260 respondents for whom platform work was their main income, 90.6% did not contribute to social security[10]. For workers who did platform work as an additional job, 23% said they made no contributions. Nearly half of the total number of surveyed U.S. AMT workers did not pay any contribution to social security. This included voluntary contributions and contributions through another job (Berg, 2016, p. 17). In response to the question whether or not the respondents 'made regular contributions to a private annuity/IRA/401k/pension or provident fund' which represents a variety of retirement and pension plans, workers in platform work as their main job, 91.9% indicated 'no', compared with 60.3% of workers for whom platform work was not the main job. About 72% of 686 U.S. AMT workers indicated 'no' to making such contributions.

Similarly, 83% of 65 Indian workers who did platform work as their main job indicated they made no regular contributions to private annuity/IRA/401k/pension or provident funds. Among those for whom platform work was not the main job, this was 57% (Berg, 2016, p. 17).

[10] No questions on social security were asked of Indian workers.

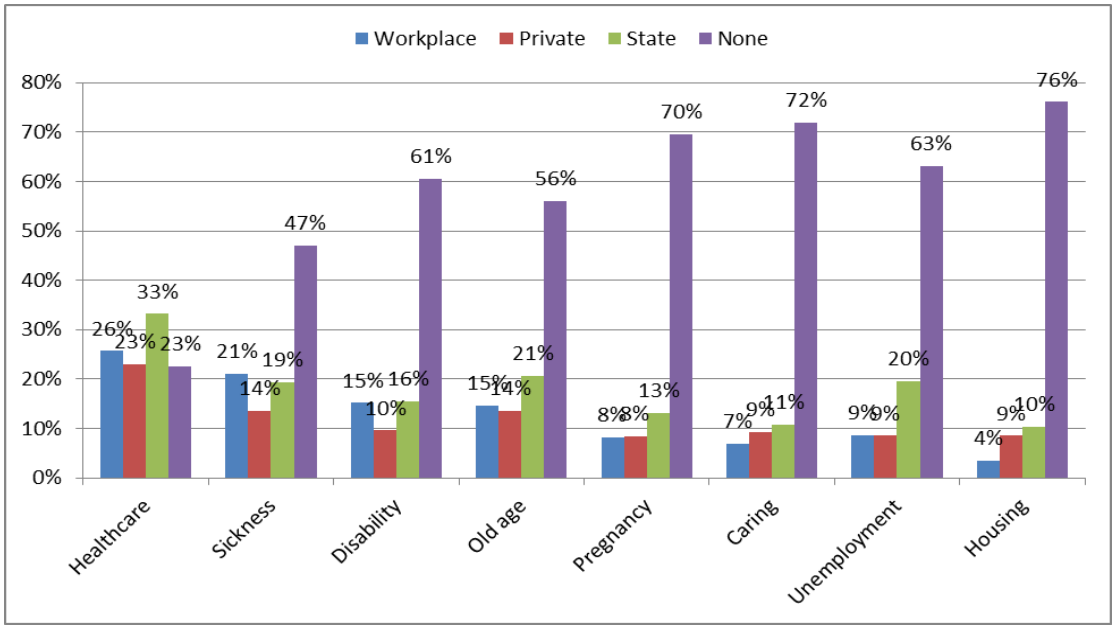
Figure 23: Share of platform workers stating that they do not pay into social security or pension funds, 2015



Source: Berg, 2016, Indian AMT N=65, U.S. AMT N=686; and DG IPOL, 2017, micro task platform workers N= 1,200.

Similarly, DG IPOL reported that only 35.5% of 1,200 micro task platform workers were paying into a personal pension (p. 57). In general, platform workers appeared to have various levels of access to different social protection schemes. Most striking is the reported proportion of platform workers who indicate they have no access either privately, through the workplace, of through the state to protections such as healthcare (22.6%), sickness benefits (47%), disability (60.6%), old age (58.1%), pregnancy (69.5%), caring (72.0%), unemployment protections (63.1%) or housing (78.1%) (DG IPOL, 2017, p. 59).

Figure 24: Share of micro task platform workers with access to social protection schemes, 2017



Source: From DG IPOL, 2017, p. 59.

Out of the eight schemes in the figure above, on average platform-dependent workers (composing a quarter of the sample) were only slightly disadvantaged in terms of access to social protections, compared with occasional platform workers. This appears strange at first glance, as occasional workers are much more likely to have another job, which would lead to the expectation that they access workplace-based protections, such as universal health care in many countries. However, this finding indicates that occasional platform workers are often in non-standard forms of employment that limit their access to various social protection schemes (DG IPOL, 2017, pp. 64–65). Yuill (2017) has pointed out that a lack of access to sick pay or parental leave has implications for the platform workers and their family life. He states that where platform workers have low or no access to basic workers' rights, this 'acts as a disciplinary mechanism that enforces a radical work ethic that erases the health and wellbeing of the embodied worker as being of concern and negates the emotional lifeworld of the worker. Everything is subsumed into a normative structure where work is all' (Yuill, 2017).

For wider implications, the vulnerable position of platform workers extends beyond individual effects and concerns society's ability to retain the capacity, financial and otherwise, to take care of all its members. If a sizeable segment of the population does not pay social contributions or insurance and underpays on tax and pensions, this will eventually negatively impact the ability of national social protection systems to provide public goods and social benefits, while the demand for those benefits will increase (Amar and Viossat, 2016; Degryse, 2017).

Representation and initiatives of platform workers

Platform workers do not have much by way of conventional forms of representation (Felstiner, 2011; Lenaerts et al, 2017). The isolated and piece-meal structure of platform work complicates the will to (self-)organise, and generally, there is weak trade union representation of platform workers. Additionally, although some jurisdictions allow self-employed persons to join trade unions (for example, Sweden), or to organise professional unions, in others, the self-employed are excluded from the right to collective bargaining. In these systems, self-employed persons are considered as stand-alone companies. Consequently, collective bargaining activities are technically speaking a violation of competition law (Eurofound, 2017; Waas et al, 2017).

Further, workers whose main job lies elsewhere may be less interested in engaging in collective action than are full-time platform workers (Schmidt, 2017 p. 14). Conversely, however, the risk of having an account deactivated without notice may be a substantial deterrent to engage in collective action for those who depend mainly or entirely on the income derived through platform work. For example, a member of the App-Based Drivers Association (ABDA) in Seattle (U.S.) found his account was deactivated in February 2016 without warning and Uber refused to explain the reasons for his suspension. Only after the American and Canadian labour union Teamsters rallied and started a social media campaign Uber reactivated the account (Groves, 2016).

As of early 2018, several trade unions have represented and supported platform workers. For example, the youth division of the Dutch Federation of trade unions (Federatie Nederlandse Vakbeweging, FNV) in the Netherlands has offered strike support for Deliveroo riders. In 2016 and 2017 in the UK, the Independent Workers of Great Britain (IWGB) and the Industrial Workers of the World (IWW) supported strikes of Deliveroo riders in London, Bristol and Leeds. Deliveroo refused to recognise the IWGB as a representative for its bike couriers (Stibbe, 2018). Consequently, the IWGB applied to the Central Arbitration Committee (CAC) to represent the riders, but was refused. Following, a panel was established to deal with the case *(TUR1/985(2016))*, and on 14 November 2017, the CAC panel judged that the union's application was not accepted, because it did not consider the riders to fall within the legal category of 'workers' (Central Arbitration Committee, 2017). Also in the UK, Britain's General Union (GMB) supported Uber drivers in a misclassification suit that the drivers ultimately won (Heyes and Newsome, 2017).

In Italy in 2016, the trade union Si Cobas supported riders who went on strike when Foodora announced it would change couriers' hourly pay of €5.40 to piecework (€2.70 per delivery). The demands of the movement focused on reducing costs incurred by bike couriers, hourly wage parity with Milan, and on employment rights such as sick pay and holiday pay. Further, the movement demanded workers to be covered by the national collective labour contract and get the minimum wage. Negotiations failed, in so far as demands were met only by way of increasing the delivery fee to €3.60. However, 15 riders who had been at the forefront of the movement were removed from the app (Troncoso, 2017).

On 19 March 2018 in India, thousands of drivers for the transport apps Uber and Ola participated in a strike which was organised by a transportation union to protest their low earnings and the recent increase in the commission fee from 10% to 30%. Further, the movement demanded that blacklisted drivers would have their cases reviewed for readmittance (Erickson, 2018).

Box 8. Platform certification and codes of conduct

The Swedish white collar trade union Unionen aims to establish certification schemes for platforms regarding fair work. Similarly, in a collaborative effort between German, Austrian and Swedish unions, Fair Crowd Work has been set up. The initiative rates work related platforms according to criteria such as pay and gives them an overall score of fairness (Silberman and Harmon, 2017). However, this is a tool for platform workers, rather than a strategy of representation per se.

Worker-organised initiatives

Micro task workers' initiatives

Targeting the specific needs of platform workers, worker-run online initiatives offer places to talk, support each other, share information on where the better-paying projects or tasks are located, etc. (Milland, 2016; Scholz, 2017). These forums have the dual purpose of sharing valuable information and exerting some form of pressure on clients. Forums include TurkerNation, CloudMeBaby, MTurkGrind, the Facebook group MTurk, and a Reddit thread (Degryse, 2017, pp. 7–8; Scholz, 2017, p. 168). Although information sharing is a long way from collective action, it does present a first step in developing the capacity of workers to negotiate with platforms and clients and to ensure adherence to norms and standards (Degryse, 2016).

Lilly Irani, from UC San Diego, has built tools in support of online worker organisation. One such tool is the browser plugin and website Turkopticon, which identifies non-paying or underpaying AMT clients who are unresponsive after rejecting work. Workers can review clients with a set of criteria that include communicativeness, remuneration, the speed with which remuneration takes place, and the fairness of the client's rejection (Irani and Silberman, 2013; Silberman and Irani, 2016). Another tool is the online discussion board Dynamo, where AMT workers can share ideas and organise themselves (Salehi et al, 2015; Scholz, 2017; Silberman and Irani, 2016).

Locally delivered task workers' initiatives

Drivers working for Uber and Lyft (previously also Sidecar) in Washington and California in 2014 established the 'App-based Drivers Association' that petitioned the platforms to make improvements in workers' favour, such as adding an automatic tip calculation to all of its fares. Uber drivers have organised strikes to protest commission fees and low fares in New York in 2016 (Wang, 2016), twice in Qatar in 2017 (Reuters, 2017), as well as in India in 2017 and 2018 (Press Trust of India, 2018).

Bike couriers for Deliveroo and Foodora in Bologna (Italy) have organised in Riders' Union Bologna and in the Netherlands and Belgium in the 'Riders' Union' and are supported by trade unions in collective action activities.

Online professional task workers' initiatives

The Oxford Internet Institute's Online Labour Strife Index tracks online workers' protests. Late 2016, a major (unspecified) platform announced it would double its fees, after which hundreds of workers made their voices heard on the platform's forum and signed a petition. Online action was concentrated in urban areas, which appears to support findings on the cost of information exchange across locations (Salehi et al, 2015) that platform work is predominantly an urban phenomenon (DG IPOL, 2017; Huws et al, 2017) and the importance of social networks for collective action (Wood, 2017).

Box 9. SMart.be

Originally in 1998, SMart was founded as a non-profit organisation in Belgium for workers in the creative industries. These workers were often on short-term contracts and struggled to qualify for social rights. Soon, SMart included autonomous workers across industries, who due to increasing digitalisation and the decrease of open-ended contracts across industries had difficulties obtaining insurance, building pensions or qualifying for social protection.
In 2014, SMart started the process to become a cooperative, which was finalised in January 2017. Ownership of the enterprise is shared by members who pay 6.5% of any amount that is invoiced through SMart. Additionally, they pay a social share of of €25 annually to be associates of the cooperative.
As of 2018 the organisation has a network of 85,000 workers from different industries and sectors across nine countries, namely Austria, Belgium, France, Germany, Hungary, Italy, the Netherlands, Spain, and Sweden, and is further growing. As of May 2016, 16,662 workers are full members of the cooperative, which is optional. In effect, SMart takes on the role of legal employer. SMart's members mutualise their earnings, so that in times of lack of available tasks, workers can draw on this pooled resource for basic income. The organisation arranges pension funds and provides workers with liability insurance, unemployment and work insurance.
SMart pays the workers within seven days of them completing a project, so that non-payment and late payment does not directly affect the individual. SMart has also played a role in the representation of platform workers in workplace negotiations (Manzanedo and Trepat, 2017). For example, in 2016, SMart signed an agreement with 90% of Belgian Deliveroo riders (3,283 riders in total) on an hourly wage for couriers which corresponds to the national average minimum wage. Additionally, the agreement included a provision for the platform companies to ensure workers have insurance for workplace accidents. SMart's agreement with the very similar food delivery platform Take Eat, which went bankrupt on 26 July 2016, resulted in SMart paying 400 bike deliverers their wages and fielding their social security contributions, in total covering €400,000 (SMart, 2017).

Implications for the labour market

Going beyond the effects on the individual affected worker, some authors also discuss macro impacts on the labour market.

Labour market access

The barrier of entry into platform work is relatively low, as participation often requires only an electronic device and an internet connection. As such, platform work may have the potential to promote a more inclusive workforce, for example by offering opportunities for people with disabilities or low mobility, people with caring duties or dependants (Yordanova, 2015), and people who may experience discrimination in the local labour market for reasons of sexuality and gender (Schmid-Drüner, 2016). Additionally, platform work may have the potential to foster economic growth in low-income or marginalised areas (Heeks, 2017; Malik et al, 2017; Schmidt, 2017). It has been found that tasks on large online professional work platforms such as Upwork are commissioned primarily from high-income nations, largely the U.S., and the largest share is performed by workers in low-income countries in South-East Asia and Africa, who sometimes earn more online than they would in the local labour market (Graham et al, 2017; Heeks, 2017). Thus, labour shortages in some areas are compensated with labour and skills surpluses in others, raising the productivity of the client and increasing capital flows toward low-income countries (Kuek et al, 2015). Also, since many low-income countries have high rates of youth unemployment, platform work may help young people find work and develop skills that may increase their chances in the wider labour market.

However, online profiles and rating systems have been used to discriminate against workers from certain geographical locations (Graham et al, 2017). Clients from English speaking countries are overrepresented on, for example, Upwork, and English is often the medium in writing and in communication between clients and workers. This sometimes results in preferential treatment for native English speaking workers.

Furthermore, the rating management systems on platforms can also prevent entry-level workers from accessing work, as tasks are often awarded to workers with an established or better reputation (Pallais, 2014; Yu et al, 2013). Rating-based systems purposely do this to reduce risk and avoid adverse selection (Horton et al, 2015; Yu et al, 2013). As a result, workers who recently joined a platform find it difficult to progress and are left with the choice either to exit the platform, or to improve their reputation by taking on small, low-paying tasks (Leimeister et al, 2016).

Situations in which entry-level workers are disadvantaged occur for example with AMT's two types of worker accounts. The general account is accessible to everyone who registers. The master's account is awarded to workers with a particularly good rating or task score, for which the qualifying standards are set by AMT, which thereby controls access and entry into the market and the tasks therein (Kingsley et al, 2015). The master account status is conferred on workers with a consistent high rating across assignments from different clients and based on performance criteria established by the platform and statistically monitored. The effect is that those who are inexperienced are not awarded tasks and cannot gain the experience required to gain entry into the market.

Similarly, on Upwork, for those with less established reputations, it can be difficult to attract well-paying tasks. For example, Graham et al's (2017, p. 150) interview with a worker on Upwork revealed that she was often rejected for well-paid tasks which were then later advertised again, but for much lower remuneration. Her client was actually a so-called 'reintermediary', who attracted tasks as a worker with a good reputation, thereby adding to their reputation and listing of completed projects, while, in the function of a client, simultaneously outsourced the work to others against a low price and pocketing the difference.

Considering that the rating of workers determines their ability to attract tasks or projects, negative evaluation of past performance can damage the prospects of a worker in securing new tasks. From a market efficiency perspective, it may be best if underperforming workers are recognised as such and consequently forced to exit the market. Reputation management provides some way of ensuring quality and reliability of remote work (Yu et al, 2013). However, critics have suggested that some platforms, for instance AMT, are structured in a way that incentivises clients to arbitrarily refuse work performed in order to dodge the

obligation of payment (Irani, 2015). As refusals are reflected in the worker's performance statistics and overall rating, arbitrary rejections damage their reputation. AMT has no policies or structures in place to deal with workers who suffer damages to their online reputation or to attain recompense for lost wages (Irani and Silberman, 2016). However, it must be noted that AMT, although large among micro task platforms, does not necessarily have a structure that is representative of other platforms. Therefore, the impact of negative rating on AMT worker's ability to attract clients may not be generalisable to all contexts.

Labour market transition

As platform work has existed for only little over a decade, literature hardly discusses how this employment form impacts workers' learning, knowledge, skills development and eventually, their employability and career prospects (Barnes et al, 2013). Barnes et al's (2015) interviews with 12 platform workers showed that some used platform work to bridge periods of unemployment and underemployment. Most interviewees transitioned from other types of work into platform work, motivated by the recession, redundancies and health problems. The bridging-pattern also appeared in Farrell and Greig (2016). It is less clear whether platform work then transitions into something else.

Theoretically, platform work could function as a bridge into secure work (Graham et al, 2017), for example by equipping individuals with experience and skills that are otherwise difficult to obtain (D'Cruz and Noronha, 2016), or by allowing entrance into areas that traditionally have high barriers, such as professional design. Platform work could allow individuals to build a network that will help them attract higher value-added work either on the platform, or develop relationships that will lead to better professional opportunities with clients that are continued beyond the platform (Malik et al, 2017). However, evidence shows that platform work only occasionally functions as a springboard into a secure, stable career (Graham et al, 2017). This would be in line with general findings on temporary and non-standard work which suggest that platform work may trap workers into a cycle of precarious work and reduce workers' social mobility (OECD, 2015, pp. 162-167).

In short: Main findings from literature on wider implications of platform work – social protection, representation, the labour market

Scientific analysis on platform workers' social protection and representation as well as the effects of this employment form on the labour market hardly exists so far.

Very few authors, yet, explore whether or not platform workers are covered by social protection. Nevertheless, the results agree that this is the case only to a limited extent. Taking into account that most platform work in Europe is currently conducted as a side activity, this may not be problematic for now, but could become so once this employment form becomes more widespread as the main job.

Similarly, the fragmented literature on representation and related aspects finds limited evidence of traditional trade unions representing platform workers. Challenges encountered by trade unions relate to legal possibilities to represent platform workers if they are considered self-employed as well as to attract them to collective voice.

A few examples of worker-initiated exchange forums or tools to help them express their voice collectively have been identified by research. Furthermore, one or the other example of platform worker strikes is referred to in the screened publications. However, the forums and tools seem to hardly relay to industrial relations and social dialogue but rather act as an information tool, and the strikes show little concrete outcomes so far.

The few findings on the effect of platform work on the labour market are ambiguous. Some authors provide a rather positive assessment by flagging that this employment form has the potential to contribute to economic growth and to overcoming mismatches as regards supply and demand for labour across regions. Furthermore, platform work is seen by few authors as improving the quality of labour (both quality standards as well as pay) in certain circumstances. A few publications also flag the potential of platform work to contribute to

more inclusive and better functioning labour markets due to low entry barriers and the opportunity to transition on to more stable jobs. At the same time, other literature discusses discrimination through ratings and the potential of labour market segmentation due to limited mobility within and beyond platform work.

Overall, it can be concluded that the discussions on wider effects of platform work are of general and theoretical nature rather than based on empirical evidence. Accordingly, also little differentiation is made by platform work type.

Table 14: Summary of the main literature on platform workers' working conditions

	Social protection	Representation, collective action, joint workers' initiatives	Functioning of the labour market	Labour market access	Labour market transition
Barnes et al, 2015	n.a.	n.a.	n.a.	n.a.	Platform work to bridge unemployment and underemployment
Berg, 2016	Limited access (micro taskers)	n.a.	n.a.	n.a.	n.a.
CIPD, 2017	Limited access	n.a.	n.a.	n.a.	n.a.
D'Cruz and Noronha, 2016	n.a.	n.a.	n.a.	n.a.	Potential stepping stone into secure employment
Degryse, 2017	n.a.	Worker-initiated exchange forums (micro tasks)	n.a.	n.a.	n.a.
DG IPOL, 2017	Limited access (micro taskers)	n.a.	n.a.	n.a.	n.a.
Erickson, 2018	n.a.	Strike of platform work taxi drivers in India organised by a trade union	n.a.	n.a.	n.a.
Farrell and Greig, 2016	n.a.	n.a.	n.a.	n.a.	Platform work to bridge unemployment and underemployment

Felstiner, 2011	n.a.	Limited representation	n.a.	n.a.	n.a.
Graham et al, 2017	n.a.	n.a.	n.a.	Partly access to labour markets with higher pay (online tasks) Discrimination based on online profiles and rating	Potential stepping stone into secure employment, but little evidence available to validate this
Heeks, 2017	n.a.	n.a.	Potential to contribute to economic growth	Partly access to labour markets with higher pay (online tasks)	n.a.
Kingsley et al, 2015	n.a.	n.a.	n.a.	Discrimination based on online profiles and rating	n.a.
Kuek et al, 2015	n.a.	n.a.	Cross-regional labour and skills matching (online tasks)	n.a.	n.a.
Leimeister et al, 2016	n.a.	n.a.	n.a.	Discrimination based on online profiles and rating	n.a.
Lenaerts et al, 2017	n.a.	Limited representation	n.a.	n.a.	n.a.
Malik et al, 2017	n.a.	n.a.	Potential to contribute to economic growth	n.a.	Potential stepping stone into employment with better conditions
Manzanedo and Trepat, 2017	n.a.	Specialised cooperative representing platform	n.a.	n.a.	n.a.

		workers towards platforms			
Milland, 2016	n.a.	Worker-initiated exchange forums (micro tasks)	n.a.	n.a.	n.a.
Pallais, 2014	n.a.	n.a.	n.a.	Discrimination based on online profiles and rating	n.a.
Salehi et al, 2015	n.a.	Worker-initiated tools to rate clients (micro tasks)	n.a.	n.a.	n.a.
Scholz, 2017	n.a.	Worker-initiated tools to rate clients (micro tasks) Worker-initiated exchange forums (micro tasks)	n.a.	n.a.	n.a.
Schmid-Drüner, 2016	n.a.	n.a.	n.a.	Potential for more inclusive workforce due to low entry barriers	n.a.
Schmidt, 2017	n.a.	Platform workers with alternative main jobs may be less interested in collective action related to platform work	Potential to contribute to economic growth	n.a.	n.a.

Silberman and Irani, 2016	n.a.	Worker-initiated tools to rate clients (micro tasks)	n.a.	n.a.	n.a.
Troncoso, 2017	n.a.	Strike of Italian Foodora riders supported by a trade union (mainly failed)	n.a.	n.a.	n.a.
Valenduc and Vendramin, 2016	n.a.	Attempts of German trade unions to organise platform workers Petition of French creative professional to regulate platform work	n.a.	n.a.	n.a.
Yordanova, 2015	n.a.	n.a.	n.a.	Potential for more inclusive workforce due to low entry barriers	n.a.
Yu et al, 2013	n.a.	n.a.	Quality assurance of work through rating	Discrimination based on online profiles and rating	n.a.

n.a. – no information available

Source: own compilation

Concluding remarks

Pointers from the literature: Potential avenues for policy and regulatory change

DG IPOL (2017) builds on recommendations by the UK's Taylor review (2017), Silberman (2017) and Huws et al (2017) as well as its own research to put forth suggestions for change in several areas, such as more structural data collection and monitoring of platforms by relevant bodies, such as statistical offices; reforming employment law to shift employment classification and social protection towards a recognition of vulnerability; designing and reforming social security in a way that will extend protections to a growing population of non-standard workers; tax reforms; and raising wages for low-paid platform workers. Lastly, DG IPOL (2017, p. 106) recommends that the EU and the Member States 'adopt strategies designed to set minimum standards for the fair treatment of workers by platforms', such as introducing independent mediators for platform workers.

- **Portability of social contributions and reputational rating across platforms**

It may be possible to adopt a multi-employer or joint-employer plan for platform workers as commonly used in construction and mining, or more recently emerging in a few Member States in the new employment form of 'strategic employee sharing (Eurofound, 2015). This allows more than one client and the platform to contribute to employee benefits into something like a pooled insurance (Arthurs, 2011; Donovan et al, 2016; Hill, 2015a). Most importantly, workers would retain benefits when they move from client to client and platform to platform. Portability would help workers to reach the usual minimum duration and income thresholds that qualify workers for benefits, such as paid holiday (Buhr et al, 2017; Hill, 2015a). Conversely, being able to transfer their online reputation between platforms would make it easier for workers to market their services or skills on competing platforms, thereby giving workers more leverage vis-à-vis the platform (Karanovic et al, 2017).

- **Minimum wage**

Huws et al (2017) argue that countries which have a statutory minimum wage should detach the minimum wage from the legal employment status and apply it to all workers. Rates for casually employed workers should include compensation for waiting and travelling time, as well as preparatory time and time spent bidding for new work. However, these rates would be set on the platform. Wood et al (2017) caution that the international aspect of platform work must be taken into consideration, as the application of minimum wage standards is likely to have different effects on workers living in different places. For example, some platforms have set global minimum wages, such as Upwork's minimum of $3 (€2.40) per hour. For a number of workers, these wages fall below the national or local minimum wage.

- **Flexibly amend existing employment classifications**

Due to the diverse and discontinuous nature of platform work, a hybrid third category of employment may still exclude many workers from accessing rights and protections that are based on duration or income thresholds. Instead, existing laws may be amended to better cover the realities of platform work. Adaptation of regulation to a specific line of work has precedence in Italy and Spain (Donini et al, 2017), which is called 'special labour law' (Todoli-Signes, 2017). A special law for platform workers could establish liability of the worker in cases that involve damage to the client or to the platform's reputation. It could set a minimum wage and potentially establish reimbursement for waiting time as well as running costs (Todoli-Signes, 2017, p. 202). Further, special labour law could focus on the different levels of dependency that exist between workers and the client or platform, include freedom

for workers to establish their own working hours and schedules, and allow the client to set a maximum number of hours.

- **Workers' rights**

Revisions to the Written Statement Directive by the Commission (European Commission, 2017) suggest that all workers regardless of employment status should have the right to be informed ahead of time of termination of work and be provided with reasons for this termination, as well as a right to appeal. Similarly, all workers should have the right to be informed of, and to be able to challenge, clients' ratings.

- **Combating tax avoidance or evasion**

The European Platform on Undeclared Work recommends that the EU introduces a binding legal instrument that would oblige platforms to 'report all transactions to the tax authorities in the countries in which they operate'; to supply the relevant tax authorities with the information they require to ensure compliance with tax laws; to inform workers of their earnings and tax obligations; and to 'protect workers from being falsely classified as self-employed' (Heyes and Newsome, 2017, p. 52).

- **Clarifying oversight**

Huws et al (2017) state that responsibilities of all affected parties in issues such as health and safety, data protection and insurance and legal liability should be further clarified. Guidelines should be established for how these areas are to be monitored and regulated. This points to the overarching issue that platforms often oversee their own processes without oversight from public or regulatory bodies.

- **Commercial versus non-commercial activities**

For EU Member States, the European Platform on Undeclared Work suggests that governments clarify what constitutes commercial and non-commercial activities within the collaborative economy and that they communicate this delineation clearly to workers, clients and platforms. Furthermore, they suggest 'governments investigate the potential for platforms to collect tax revenues and forward them directly to the tax authority' (Heyes and Newsome, 2017, p. 52)

Final considerations of the authors

Platform work, the matching of supply and demand for paid labour through platforms, is an employment form that has been emerging on European labour markets and beyond over the last decade. Available data on the scale and scope of platform work is very limited and comes to different findings. This can be attributed to the use of different connotations and understandings of the concept by both policymakers and researchers, making a harmonised or standardised data collection, or the comparison of different findings, rather impossible. Furthermore, platforms, clients and workers are, for the time being, hardly ever required to register with specific authorities. This results in a non-existence of administrative data to capture the phenomenon.

Nevertheless, anecdotal evidence points towards a growing dynamism related to platform work. New platforms seem to continuously emerge, at least some of the existing ones grow, and the number of affiliated clients and workers are assumed to be increasing.

Accordingly, the reality of platform work is becoming more and more diverse, with an increasing heterogeneity within this employment form. While some of extant literature has already started to touch upon that by introducing classifications of platform work, to the authors' knowledge, this working paper is the first attempt to establish a much more comprehensive typology of platform work. By identifying 'classification elements' and

suggesting their various combinations, the paper shows the substantial potential of this employment form for the future. Even if it is obvious that not all of these platform work types are currently relevant, nor probably will be in the future, the theoretical framework established in this working paper is important. It can be used to raise awareness among policymakers on the potential applicability of this employment concept and serve as an analytical framework for future research, to better streamline individual investigations to facilitate comparability. This would also improve the quality of available information by enabling a better compilation of the various small-scale research activities (most of them being based on small quantitative surveys or qualitative research based on a limited number of interviews) on the topic. Such, however, also requires further operationalisation of the individual classification elements and their manifestations.

The differentiation within platform work is important as current discussions, notably on the employment status of platform workers, as well as some research findings on working conditions and labour market impact indicate that the story on platform work is not a simple one. Policymakers, courts and academia come to different findings – which are not necessarily related to misunderstandings or misinterpretations, but rather to the real differences in the discussed cases of platform work. To further progress both policy debate and research on the topic, it is suggested to deviate from more generally discussing 'platform work' per se, but to apply a more differentiated approach, focusing on specific types as identified by the comprehensive categorisation suggested in this paper.

The review of existing literature conducted for this paper has shown that during the last decade, a growing body of knowledge has been created on this employment form. Nevertheless, it also pinpoints that there are still considerable gaps. Both micro level working conditions and macro level labour market effects require better exploration. The characteristics of the specific types of platform work – or at least of those which are assumed to have the highest potential to grow or be disruptive – must be taken into account. Furthermore, as both working conditions and labour market effects are multidimensional concepts, they must be approached in a more systematic and structural way. This means that research should not only investigate individual elements of these concepts, but their 'full sets' as the individual elements are interdependent and an isolated exploration results in misleading presentations of the reality. Ideally, also comparisons between platform work and traditional employment forms by, for example, sector or occupation should be realised to better single out the effects of the employment form and neutralise more structural characteristics (for example, work schedules in certain service industries that by their very nature need to consider the clients' needs).

Along this line, research and discussions on platform work should not be limited to work and employment. Also aspects like competition, data protection, intellectual property or liabilities should be considered as they are strongly relevant for this employment form and (also) influence working and employment conditions of the affected workers.

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Annex A: List of platforms

Platform	Label	Type of tasks	Geographical scope
Amazon Mechanical Turk	Online moderate skilled click work	Content tagging, transcription, surveys	Clients: Global. Workers U.S. and India
Axiom	Online client-determined specialist	Legal advice and services	North-America, Europe, Asia-Pacific
Boblr	Online contestant specialist	Design contest	Global
Cammeo	Local platform-determined routine work	Personal transport (taxi)	Croatia, Slovenia, Serbia
Chabber	Local client-determined routine work	restaurant and bar tasks	Denmark
Cleady	Local client-determined moderate skilled work	Cleaning and maintenance	Denmark
Clickworker	Online moderate skilled click work	Copywriting, tagging, surveys	Global
Crowdsource	Online moderate skilled click work	Copywriting, transcription, data cleaning, tagging	Global
Daru	Local worker-initiated moderate skilled work	Repair and maintenance, education, transportation	Latvia
Deliveroo	Local platform-determined routine work	Food delivery by bike	8 EU countries and Australia, Arab Emirates and Hong Kong
Ehrana	Local platform determined routine work	Food delivery	Slovenia
Epweike	Online contestant specialist	Design, business assistance, software development	China
Figure Eight (formerly CrowdFlower)	Online moderate skilled click work	Online micro task	Global
Fiverr	Online client-determined specialist	Translation, design, copywriting	Global
Foodora	Local platform-determined routine work	Food delivery by bike	Australia, Canada, 9 EU countries, Norway, India and 9 South-Asia and Asia-Pacific countries
Freelancer	Online client-determined specialist	Content production, web design and development, software development,	Global

		data entry	
Freska	Local client-determined moderate skilled work	Household task (cleaning)	Finland
Gengo	Online client-determined specialist	Translation	Global
Gigwalk	Local platform determined expert	Local checking and reporting on brands and products	8 cities in the U.S.
GoOpti	Local platform-determined routine work	Personal transport	9 EU countries
GoPillar	Online contestant specialist	Design	Global
GoWorkaBit	Local client-determined moderate skilled work	Business assistance	Estonia
Guru	Online client-determined specialist	Architect, design, translation, web and software development, business assistance	Global
Handy	Local client-determined moderate skilled work	Cleaning and furniture assembly	Canada, UK and U.S.
Handy hand	Local client-determined moderate skilled work	Gardening and maintenance	Denmark
Happy Helper	Local client-determined moderate skilled work	Cleaning	Denmark
Helpling (previously Hassle)	Local client-determined moderate skilled work	Cleaning	Australia, Germany, France, Ireland, Italy, Netherlands, Singapore, United Arab Emirates, United Kingdom
Just-eat	Local platform-determined routine work	Food delivery	Australia, Brazil, Canada, Denmark, France, Ireland, Italy, Mexico, Norway, New Zealand, Spain, Switzerland, United Kingdom.
K68	Online contestant specialist	web and software development, creative and home design, business assistance	China
Kaggle	Online contestant specialist	data science	Global
Klean	Local client-determined moderate skilled work	Cleaning	Latvia
ListMinut	Local client-determined	Gardening, pet-sitting,	Belgium

	moderate skilled work	cleaning, transport, repair and maintenance	
Loconomics	Local worker initiated moderate skilled work	Repair and maintenance, child care, elderly care, transport, business assistance	San Francisco, U.S.
Luxe	Local platform-determined routine work	Transport: valet parking	U.S.
Lyft	Local platform-determined routine work	Personal taxi transport	Canada and U.S.
Microworkers	Online moderate skilled click work	Tagging, transcription, surveys, app testing	Global
Moppi	Local client-determined moderate skilled work	Cleaning	Finland
Mybuilder	Local client-determined moderate skilled work	Repair and maintenance, indoor and outdoor fittings, carpentry	UK
Mytaxi (previously Hailo)	Local platform-determined routine work	Personal transport (taxi)	13 countries
Ola	Local platform-determined routine work	Personal transport (taxi)	India
PeoplePerHour	Online client-determined specialist	Design, admin, software and web development, business assistance	Global
Postmates	Local platform-determined routine work	Food delivery	20 cities in U.S.
Rated People	Local client-determined moderate skilled work	Carpentry, gardening, plumbing	UK
Taskcn	Online contestant specialist	Design, business assistance	China
TaskRabbit	Local worker-initiated moderate skilled work	Repair and maintenance, cleaning, furniture assembly	44 cities U.S. and London, UK
Take-out	Local platform-determined routine work	Food delivery	Denmark
Taxify	Local platform-determined routine work	Personal transportation (taxi)	27 countries in Africa, Europe, Middle East and Canada and Australia
Temper	Local client-determined moderate skilled work	restaurant and bar work	Netherlands
Testbirds	Online platform-determined expert	Software testing	Global
TestCloud	Online platform-	Online professional task	Germany

	determined expert		
Thuisbezorgd	Local platform-determined routine work	Food delivery	Netherlands
Thumbtack	Local client-determined moderate skilled work	Sports, wellness, gardening, transport	U.S.
Timeetc	Online platform-determined expert	Business assistance	UK (workers), global (clients)
Topdesigner	Online contestant specialist	Creative design	The Czech Republic
Treamer	Local client-determined moderate skilled work	Household tasks, events and business assistance	Finland
Twago	Online client-determined specialist	Design, business assistance	Spain
Uber	Local platform-determined routine work	Personal transport (taxi)	84 countries
Up & Go	Local client-determined moderate skilled work	Platform cooperative for household task	New York, U.S.
Upcounsel	Online client-determined specialist	Legal advice	11 cities in the U.S.
Upwork	Online client-determined specialist	Online professional task	Global
Vayable	Local client-determined moderate skilled work	Local tour guiding	Cities only. Athens, Barcelona, Berlin, Dublin, Istanbul, Lisbon, Paris, Rome, Vienna.
Villamedia	Online client-determined specialist	Journalism	Netherlands
Werkspot	Local client-determined moderate skilled work	Repair and maintenance, carpentry	Netherlands
Wolt	Local platform-determined routine work	Food delivery	Denmark, Estonia, Finland, Latvia, Lithuania, Sweden
Worksome	Online client-determined specialist	Web and app design and development, graphic design, business assistance	Denmark
Zhubajie/Witmart	Online contestant specialist	Design, software, business assistance	China

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