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Pesole, Annarosa; Fernandez-Macias, Enrique; Brancati, Cesira Urzi; Herrera, Estrella Gomez

Working Paper

How to quantify what is not seen? Two proposals for measuring platform work

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JRC Technical Report

How to quantify what is not seen?
Two proposals for measuring platform work

JRC Working Papers Series on
Labour, Education and Technology
2019/01

Annarosa Pesole, Enrique Fernández-Macías,
Cesira Urzí Brancati, Estrella Gómez Herrera.

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Contact information
Name: Annarosa Pesole
Address: SVQ-EXPO 02/226
Email: annarosa.pesole@ec.europa.eu
Tel.: + 34 954 488 299

EU Science Hub
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How to quantify what is not seen? Two proposals for measuring platform work

Annarosa Pesole, Enrique Fernández-Macías, Cesira Urzí Brancati, Estrella Gomez Herrera
(European Commission Joint Research Centre)

Abstract

Digital labour platforms are defined as digital networks that coordinate labour services in an algorithmic way. The rise of digital labour platforms can reshape work organisation and tasks distribution across the workforce, posing new policy challenges. A crucial problem for the design of an adequate policy response is the lack of clear estimates of the prevalence of platform workers. This paper proposes two approaches for measuring platform work. The first approach attempts to measure platform work as individual participation in the labour force through surveys, similarly to what is done by the Labour Force Survey (LFS) for traditional employment. Given the structural differences between traditional employment and platform work, the identification of the latter through surveys should include measures that assess also the regularity, intensity and significance of platform work, with a specific focus on the task performed. The second approach aims at deriving estimates of platform work as labour input. In other words, instead of asking workers if they provide services via platform, the data can be collected from the platform itself. The vast amount of information platforms collect could be used to estimate the number of hours worked via platforms and gather more detailed evidence on wages. However, the mixed use of platforms and the ambiguous identification criteria of individuals on platforms could raise issue of double counting when measuring employment using this second approach.

Keywords: Digital labour platform, gig workers, technological change, work organisation, employment indicators

Authors: Annarosa Pesole, Enrique Fernández-Macías, Cesira Urzí Brancati, Estrella Gomez Herrera (European Commission Joint Research Centre

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Contents

Introduction 1
Digital labour platforms: a conceptual discussion 3
A review of previous measurement attempts 4
Measuring platform work in Europe: two proposals 6
Measuring platform work as labour input 11
Conclusions 14
References 15
Annex 17

Introduction

The spread of the internet and the advance in digital technologies have favoured the expansion of digital platforms in a growing number of sectors of the economy, affecting not only markets for goods but also markets for services, including labour. Digital platforms are so new that we have still very limited information about what are their main socio-economic implications. In fact, we barely even know the extent of the phenomenon, because existing statistics cannot capture platforms properly. In this paper we focus on one specific category of digital platforms, those that primarily coordinate the provision of labour services. In order to do so, we need to address first the thorny issue of the lack of a consistent definition of the digital platform economy.

Whether digital platforms are defined as 'sharing economy', 'collaborative economy' or 'gig economy' can affect the way platforms are perceived, studied and eventually regulated. The label chosen entails a particular perspective on the phenomenon and emphasizes some attributes over others. Those who emphasise the potential of platforms to raise productivity, unleash creativity, unlock the commercial value of underused personal assets and reorganise work in a more efficient and free manner tend to use positive terms such as 'sharing' and 'collaborative economy' (Kenney and Zysman 2016). On the other hand, those who believe that, platforms exercise an unprecedented control over the work organisation and an appropriation of value generated by human effort and the use of consumer assets use more negative terms such as 'gig economy'. According to this negative view, platforms generate fragmented work schedules and exacerbate the already existing duality between temporary and permanent workers by introducing an even more precarious category: the gig-workers.

In our view, it is still unclear to what extent the phenomenon of digital platforms (in particular those coordinating labour, which is the focus of this paper) fits better the positive or the negative views implicit in those different terms, given the very limited evidence on this subject. Therefore, we avoid those normative terms and use instead the more neutral terms of "platform economy" and "digital labour platforms".

There is not only a normative issue in the definition of the digital platforms, but also a disagreement on what the digital platform economy should encompass when it comes to measuring it. It is not the aim of this paper to elaborate a taxonomy of the digital platform economy, but some clarity is needed. We therefore start with a brief discussion and classification of the platform economy, with a specific focus on digital labour platforms.

Digital platforms are a new form of coordinating economic activity that emerged as a result of the combination of some key technologies of the digital revolution, in particular decentralized information networks, big data analytics and mobile digital devices. As economic institutions, they do not fit neatly into either of the two main forms of economic coordination of contemporary capitalism: firms (organisations) or markets. Platforms incorporate elements of both markets and firms (they put together supply of and demand for a certain good or service, and also directly manage the transaction), but also transcend them (they can provide more transparency and efficiency, and expand the range of economic activity). Platforms can be defined as digital networks that coordinate transactions in an algorithmic way (Fernández-Macías 2017).

In general terms, the digital platform economy includes four broad branches: i) e-commerce platforms; ii) asset-based platforms; iii) digital labour platforms; and iv) the original collaborative or sharing platforms. E-commerce platforms are on-line markets for goods, with additional features enabled by their use of digital networks and algorithmic coordination. Asset-based platforms coordinate the renting or use of physical assets and generate a profit out of it (e.g. Airbnb, Turo, etc). Digital labour platforms are digital networks that coordinate labour service transactions in an algorithmic way (e.g. Amazon Mechanical Turk, Upwork, Uber). The last category,

collaborative platforms, includes platforms where the coordinated service or goods transactions do not involve monetary exchange and/or financial gains for participants, such as home-swapping, couch surfing, ride-sharing (e.g. blablacar)[1], wiki platforms, non-equity crowdfunding (e.g. kickstarter) and social media platforms.

The differentiation among these four types of platforms is not always obvious and clear- cut. For example, in some cases (such as Airbnb and Uber), the service provider needs to own an asset (a house or a car) and at the same time provide a service that entails labour. This raises the question of whether Airbnb and Uber should be treated the same way. In Pesole et al. (2018), Uber is classified as a digital labour platform but Airbnb is not for two reasons. First, the relative importance of the asset with respect to the service provided; second, the parallelism between the offline and online world. Indeed, in the offline world a person who lives off the rent of his or her properties is not considered as employed in the main labour statistics (e.g. Labour Force Survey). By contrast, a taxi driver, who usually owns the car as well, is considered a worker. However, the continuous evolution of these platforms - for example now Airbnb offers more services than just accommodations - adds an additional layer of complexity in defining what it should be considered labour service or capital rent. The distinction between the original collaborative platforms and digital labour platforms can also be equivocal and fluid. Sometimes there can be monetary exchanges involved in the case of collaborative platforms, for instance the money exchanged in a BlablaCar ride for sharing the costs. Even if nominally involving only cost-sharing and no gain or profit, BlablaCar can, in practice, easily become a source of income for ride providers in practice. Furthermore, some of those collaborative platforms may turn into standard digital labour platforms in the future, openly encouraging monetary transactions and economic gain in exchange for the services provided.

The main objective of this paper is to propose a new, two-fold approach for the measurement of work in digital labour platforms. The remainder of this paper is structured as follows. First, we will discuss the main characteristics of work in digital labour platforms, focusing on how they differ from standard employment. Then, we will present a systematic review of previous measurement proposals, including a discussion of the different estimations available in the literature for this emerging phenomenon. Finally, we will introduce our two proposals for the measurement of labour in digital labour platforms: one focusing on platform work as a form of employment (from the perspective of workers), and one focusing on platform work as labour input (from the perspective of platforms).

[1] The difference between blablacar and uber will be explained later in the text.

Digital labour platforms: a conceptual discussion

Digital labour platforms allow clients to match the demand for a specific task with the supply of a worker who possesses the capability to perform the task. . Digital labour platforms can be broadly classified according to the type of tasks and skill levels required: i) platforms that mediate physical service tasks, typically requiring low or medium skills (such as Uber, TaskRabbit, etc); ii) platforms that mediate small online tasks and typically require low-skills, which are sometimes called microwork platforms (such as Amazon Mechanical Turk, CrowdFlower); and iii) and platforms that mediate larger online tasks or projects typically involving high, specialised skills, sometimes called freelancing platforms (such as PeoplePerHour, Freelancer, Upwork, etc)

The matching takes place through the intervention of algorithms that pair services to workers with some initial pre-established conditions. The algorithmic rules that govern this matching, and often also monitor and manage the provision of the services, are in most cases obscure to both the clients and the workers, who are mostly left with the only option of "take or leave" the match offered. This set of algorithmic rules performing traditional managerial functions is at the core of a new frontier of work organisation and management, referred to as algorithmic management (Lee et al., 2015).

Algorithmic management allows companies to oversee a multitude of distributed workers in an optimised manner and at a large scale. Algorithms define the rules of work assignment, work process optimisation (e. g. the surging price system adopted by Uber) and workers' performance evaluation (e. g. the rating system). That is, algorithmic management goes well beyond offering mere match-making services and many platform operators rely on constant algorithmic monitoring to ensure tight control over every aspect of work and service delivery. Features such as acceptance rates, time to perform the task and ratings are factored into the algorithm. Deviation or failure to comply with the platform 'policy' can result in sanctions up to the one-sided decision to deactivate the worker's profile.

Algorithmic management can lead to a significant reorganisation of work and production processes. We can call this (potential) effect of digital labour platforms an 'unbundling of tasks', which is in fact a radical deepening of the division of labour. The principle of the division of labour implies that jobs specialisation raises productivity, and leads to a more effective control of the production process. However, jobs as we know them today do not consist of a unique task; rather they are bundles of tasks with higher or lower degrees of complementarities. In theory, combining complementary tasks into jobs increases workers' productivity and facilitates the organization of production. Any unbundling of tasks, therefore, should be such that the gains from additional task specialisation exceed the loss in productivity (Görlich 2010).

The limits of task specialisation are determined by transaction costs and market size. Digital networks and the advent of cloud computing gave access to abundant resources of computer storage and data collection that, together with augmented computing power for algorithmic mediation, allow for a highly efficient coordination of processes and a consistent reduction of transaction costs. Furthermore, digital labour platforms also broaden the geographic boundaries of labour markets and potentially operate very efficiently at a global scale. The ability of digital platforms to pool together at almost no cost millions of service providers, with increasing offshoring and outsourcing of tasks, can result in even further task specialisation to the detriment of jobs as we have traditionally known them.

The broader social implications of this breakdown of jobs and unbundling of tasks are still unclear. It is a well-known insight of Social Sciences that jobs are not only contracts for the provision of labour services, but positions in the social structure that provide access to resources, identity and recognition. In Durkheim's words, jobs are a crucial anchor of "organic solidarity", a system of

representations rooted in and reflective of concrete social groups (Lincoln and Guillot 2004). The dissolution of jobs into atomised tasks provided via digital platforms could undermine this crucial role of jobs as anchors of the social structure.

A number of regulatory issues arise along the expansion of digital labour platforms and their implications for work and employment. On the one hand, digital labour platforms can lower the entry barriers to the labour market, facilitate labour market participation through better matching procedures and ease the working conditions of specific groups (i.e. workers with strong family commitments, people with disabilities or health conditions, youth, people not in education, employment or training - NEETs, older workers, retired, long-term unemployed, people with a migrant background). On the other hand, digital labour platforms typically rely on a workforce of independent contractors whose conditions of employment, representation and social protection are at best unclear, at worst clearly disadvantageous.

In most cases, independent contractors are not covered by the labour rights and welfare support applicable to dependent employment. Health and safety regulations and social security contributions are typically the responsibility of independent contractors alone. Both the platforms and the platforms' clients tend to discharge themselves of any responsibility with respect to the conditions of work and employment of the independent contractors. This can result in a cheaper and more flexible supply of labour services, but at the expense of precarious conditions of work and employment for workers. Furthermore, platform workers might incur the risk of very fragmented working careers.

An additional aspect of work in digital labour platforms which is particularly problematic for policy purposes is its invisibility. Indeed, the unstructured and atomised nature of platform work makes it very difficult to adequately measure it, a problem which is further complicated by the novelty of the phenomenon. In the following section, we present a critical review of existing proposals to measure platform work, and their different estimations.

A review of previous measurement attempts

This section reviews the existing literature on platform work, with a specific focus on how it is measured. The main objective is to compare different measurements, discuss the methodology and approach behind each measurement, and illustrate how they may lead to radically different estimates.

The provision of services mediated by online platforms is a relatively recent phenomenon; for instance, Amazon Mechanical Turk was publicly launched in 2005[2], PeoplePerHour in 2007[3],while Uber was founded in 2009[4]. Similarly, most studies of platform work are only a few years old and therefore it should not come as a surprise that a set of standardised measures has yet to emerge. The lack of a precise taxonomy is an additional element of complication, since what this article calls platform work has been referred to in the literature by a variety of names, such as collaborative economy, sharing economy, gig economy, and other terms which are often loosely defined.

This review includes academic articles, technical reports and grey literature mentioning the words: collaborative economy, sharing economy, gig economy, crowdworking, crowdsourcing, online

[2] https://blog.mturk.com/bringing-future-innovation-to-mechanical-turk-c67e489e0c37

[3] https://www.peopleperhour.com/site/aboutus

[4] https://www.peopleperhour.com/site/aboutus

outsourcing, platform work and on-demand workers; we excluded the literature on teleworking, atypical working arrangements, and other types of self-employment. Furthermore, we included only empirical studies which provide an original estimate of the number of all platform workers, either through surveys, or through other methods. This means that we leave out purely qualitative studies, based on in depth interviews, focus groups, and so on. A number of articles cannot be included as they draw on data only from one or two specific platforms: Hall and Krueger (2015) or Cramer and Krueger (2016) on Uber; Berg (2016) on Amazon Mechanical Turk and Crowdflower; and Ipeirotis (2010) on Amazon Mechanical Turk. Similarly, we excluded the study carried out by Kuek et al. (2015) for the World Bank because it estimates the market size of the platform economy only in terms of revenue and not in terms of workers.

The review of the literature returned 13 research papers, including JRC's own Pesole et al. (2018). The selected studies have been carried out between 2015 and 2018, and cover mainly the US, Europe and Canada (see Table 1 in Annex).

Eight studies examine survey data, which provide information on participation in platform work eliciting it directly from respondents; most of the surveys were conducted ad hoc, while in one case a specific question on platform work was introduced in the official labour force survey (Statistics Canada, 2017); two studies collected and collated publicly available data on the main platforms, while the remaining three devised a way to infer the overall number of people working on labour platforms by combining information on google searches and the number of Uber drivers.

According to this review, surveys tend to yield a much higher prevalence of platform work than the other methods. However, even among studies based on surveys, we found a substantial heterogeneity in estimates, depending both on the scope - what constitutes platform work - and on interviewing methods - online versus offline surveys. Given that platform work is inherently linked to high internet usage, it is plausible to assume that online surveys may intercept a higher number of platform workers. Finally, while the greatest majority of surveys were conducted ad hoc, the Canadian government added a question on what was termed as "collaborative economy" to the official labour force survey. The estimates for Canada are particularly low, 0.3%; however, they look only at "ride services", facilitated by platforms such as Uber or Lyft, during a period of twelve months.

The remaining five studies selected for this review used publically available platform data to estimate the size of the platform workforce. Three of them were focused on the US and two on Europe; compared with surveys, these studies estimate the prevalence of platform work at much lower rates, between 0.05% and 1.5% of the total population (see Table 1). Even though they all use publically available data and attain very close estimates, they differ substantially in the way they calculate the prevalence of platform work and they mostly take into account a limited number of platforms.

The last two studies, Harris and Krueger (2015) and de Groen and Maselli (2016) made use of novel data sources and adopt the same methodology to estimate the size of the platform workforce in the US and Europe respectively. Harris and Kruger select 26 labour platforms then they subsequently use Google Trends to track the number of searches containing the name of those platforms that they then normalise to searches for the term "Uber" and use this measure of proportionality to derive some rough estimates of platform workers - between 600,000 and 1.9 million workers - by multiplying this measure for the number of Uber drivers.

The main issue with the methodology adopted in both papers is that it appears to rely on a series of dubious assumptions. First of all, the authors assume the existence of a direct relationship between google searches for the name of a platform and the number of workers providing services through it; secondly, they also assume that this relationship is the same for all platforms, which seems unlikely. For instance, they find that the searches for "Upwork" are roughly 3.5% relative to Uber. Since according to McKinsey (2015), the number of individuals registered with

Ubers approximates to 160,000 in 2013- 2015, then it follows that Upwork should have roughly (160,000*0.035 =) 5,600 registered individuals. However, McKinsey report that the number of individuals registered with Upwork is equal to 2.5 million, so in this case the relationship between searches for a platform and registered individuals does not seem to hold. It must be noted though that Harris and Krueger specifically state that their estimates are not precise and further work needs to be done.

Finally, a forthcoming study by the European Commission tried to estimate the number of people providing services via online platforms indirectly, by combining Eurostat aggregate data on sectoral employment with information on platforms revenues. The authors of the study estimate that approximately 1.79% of the European workforce provide services via online platforms. However, this figure is likely to be an underestimate, as it refers to full-time equivalent, a concept scarcely applicable to platform work.

Measuring platform work in Europe: two proposals

The figures on platform work available for Europe vary widely as shown in section 3. The issues here include the different definition of what constitutes platform work, as well as the methodology used to estimate it in terms of employment. The following sections provide suggestions on how to improve the measurement of platform work as a form of employment (which can be measured via surveys) or as labour input (which can be measured via administrative data provided by platforms).

First, platform work could be measured as individual employment through surveys, equivalent to what is done in traditional labour markets by the Labour Force Survey (LFS). Information about frequency and intensity of platform work are also needed so that a profile of regular employment could be constructed.

Secondly, it can be measured as labour input, equivalent to what is done by the Structural Business Statistics (SBS). Traditional labour input indicators are quarterly business cycle indicators measuring the number of persons employed (employment), the number of hours worked (volume of work done), and gross wages and salaries. Since each worker and each transaction that takes place in the platform are monitored and registered by the platform itself, it could be possible to collect and process those data for the creation of equivalent indicators for platform work.

Measuring platform work as a form of employment

The European Union Labour Force Survey[5] (EU LFS) is the reference statistical source to assess labour participation in Europe. For the identification of persons in employment in the EU LFS, the statistical office of the European Union (Eurostat) uses the following definition:

Employed persons are persons aged 15 years and over who, during the reference week performed work, even for just one hour a week, for pay, profit or family gain or who were not at work but had a job or business from which they were temporarily absent because of something like illness, holiday, industrial dispute or education and training[6].

[5] The European Union Labour Force Survey (EU LFS) is conducted in the 28 Member States of the European Union, 2 candidate countries and 3 countries of the European Free Trade Association (EFTA). The Labour Force Surveys are conducted by the national statistical institutes across Europe and are centrally processed by Eurostat.

[6] http://ec.europa.eu/eurostat/web/lfs/methodology/main-concepts

The actual implementation of this concept in the LFS questionnaires is derived from two direct questions: 1) whether the respondent did any paid work as employee or self- employed in the 7 days before the interview; 2) if she did not, whether she had a job or business that she was away from in the last 7 days[7]. A similar approach could, in principle, be applied to work performed via platforms. But would such a measure of *persons in employment via platforms* be useful?

As discussed in the introduction of this paper, the typical unit and structure of a labour relation in a regular and a digital platform-coordinated labour market are radically different. Whereas the labour provided via regular labour markets is in the majority of cases structured by jobs (understood as bundles of tasks that correspond to more or less stable positions within productive organisations), the labour provided via online labour platforms is in most cases structured by tasks (a small and clearly defined piece of work to be done, which is contracted and provided separately each time). Knowing that someone has provided some work for pay or profit in a regular labour market most likely implies that such a person has a *job*, whereas knowing that someone has provided some work for pay or profit through a digital labour platform simply implies that such a person has carried out at least *one task during the reference period.*

This has two important corollaries for the purposes of measuring platform work: 1) the identification of platform work as a form of employment requires assessing not only whether someone has done some work via platforms during a particular reference period, but also the regularity, intensity and significance of that work; 2) any measure of the attributes of the work performed or the type of labour relationship must be made at the level of the specific tasks.

In practical terms, we propose the following principles for the measurement of platform work as a form of employment (assuming that the measurement is implemented through a survey aimed at the working age population, such as the EU LFS for instance).

First, ask the respondent about the provision of any labour services via digital labour platforms to identify the (platform) employment status of the worker:

1. Identify if the person has ever provided labour services via digital labour platforms.

2. Qualify the provision of labour services via digital labour platforms in at least the following respects:

(a) Locus (online or in-person provision)

(b) Regularity (how often) over a specific reference period (e.g. last month)

(c) Time allocated (working hours) in the reference period.

(d) Income generated (in monetary terms and as a share of total personal income)

Using information on the regularity, time allocated and income generated via digital labour platforms, thresholds can be set to classify platform employment as:

1. Regular (equivalent to a regular job: regular, enough hours, enough income)

2. Secondary (regular but less than enough hours and income)

3. Sporadic (infrequent and inconsequential in terms of time or income).

Secondly, identify the characteristics of the labour provided via online labour platforms, asking for the specific tasks performed over the reference period:

[7] For example, see the questionnaire of the UK Family Resources Survey, https://circabc.europa.eu/sd/a/d47a0d25-55fe-4282-b328-e6d294f31d50/2015 Questionnaire UK.pdf

1. Classification of the tasks type provided via digital labour platforms over the reference period within a typology defined by the specific skills required. The use of a tasks framework that can be also applied to regular work (for instance, Fernández-Macías and Bisello 2016) can be useful to compare the tasks carried out within platform work and regular work. If respondents worked on multiple task categories, the time worked in each task category in the reference period should be asked.

2. For the main task category over the reference period, the following information can be collected:

(a) Number of transactions.

(b) Number of platforms used.

(c) Number of clients.

(d) Income generated.

(e) Time spent.

(f) Typical location.

(g) General conditions (physical and psychological risks, social interaction, intrinsic rewards and satisfaction).

We can use a recently conducted pilot survey on platform work, the JRC COLLEEM survey, to provide an illustration of this kind of approach (see Pesole et al. 2018). The JRC COLLEEM online survey is representative of all internet users between 16 and 74 years old in 14 European countries. Since the respondents were randomly selected from a commercial list of internet users obtained through the consent of individuals (presumably through online campaigns), the coverage of the sampling frame can itself be a source of bias. It seems plausible that the people more likely to work via digital platforms are also more likely to give their consent to their inclusion in such a database, and this could lead to some upwards bias in the estimation of the phenomenon. This is something that must be taken into account when discussing the results from this survey and similar ones[8].

The JRC COLLEEM survey contains a direct measure of labour services provision via platforms by the respondents as the one suggested above. It asks whether the respondent has ever gained income from different online sources, among which there are two corresponding to labour service platforms (online or in-person provided): "providing services via online platforms, where you and the client are matched digitally, payment is conducted digitally via the platform and the work is location-independent, web-based" and "providing services via online platforms, where you and the client are matched digitally, and the payment is conducted digitally via the platform, but work is performed on-location (i.e. in-person)". The share of the JRC COLLEEM sample that responded positively to either of those questions is reported in the first panel of Figure 1. However, these figures have to be adjusted to refer to the full working age population. This is done in panel 2, which shows an adjusted estimation of working age population that has ever performed some work coordinated by digital platforms, ranging from 12% in the UK to 6% in Finland.

As previously mentioned, this measure of platform work is too broad to be useful. It is necessary to qualify it by assessing the regularity, time intensity and income generated by the platform labour activity. This is presented in panels 3 to 6, with an increasingly restrictive definition. Panel 3 shows those platform workers that do it with some regularity (at least once a month); panel 4

[8] For instance, the survey carried out by the University of Hertfordshire under the coordination of Ursula Huws which provides similar estimates to those of JRC COLLEEM uses a similar sampling strategy and may thus suffer from similar biases (see Huws et al. 2017).

those who work at least 10 hours a week on platforms; panel 5 those who get at least 25% of their income via platform work; and finally, panel 6 those that get 50% of their income or more through platform work. The reduction in the estimate of the incidence of platform work is very significant when the regularity, intensity and income aspects are taken into account: from 10% for the overall sample, the final figure lower to around 2% of the working age population. Again, this has to be understood as a first approximation using a pilot survey, but it serves as an illustration of how platform work as a form of employment can be measured in surveys. Still, it would be useful to probe the answers to the initial questions by asking for the main specific platform used, to make sure that the respondent does not mistakenly refer to regular work performed online (telework).

Figure 1. An estimation of platform work as a form of employment

	1. Initial			2.	3.	4.	5.	6.
	%	Cases	N	Adjusted to pop.	Estimate frequent	Estimate sign hours	Estimate sign income	Estimat main
UK	12.6%	268	2,320	12.0%	9.9%	6.7%	8.5%	4.3%
Spain	15.1%	388	2,331	11.6%	9.4%	6.6%	6.1%	2.0%
Germany	11.8%	247	2,319	10.4%	8.1%	6.6%	6.5%	2.5%
Netherlands	10.6%	217	2,314	9.7%	8.7%	5.4%	6.5%	2.9%
Portugal	15.7%	405	2,305	10.6%	7.1%	6.0%	4.2%	1.6%
Italy	13.5%	375	2,317	8.9%	7.1%	5.4%	5.4%	1.8%
Lithuania	13.5%	296	2,308	9.1%	5.9%	5.6%	5.6%	1.6%
Romania	14.2%	311	2,307	8.1%	6.4%	4.5%	3.8%	0.8%
France	8.8%	170	2,315	7.0%	5.9%	4.2%	4.8%	1.8%
Croatia	12.1%	274	2,300	8.1%	5.2%	5.2%	3.0%	1.0%
Sweden	7.8%	164	2,321	7.2%	5.3%	3.5%	4.6%	1.6%
Hungary	8.9%	200	2,309	6.7%	5.0%	4.1%	3.5%	1.3%
Slovakia	8.5%	183	2,313	6.9%	5.1%	2.7%	3.7%	0.9%
Finland	6.9%	121	2,310	6.0%	4.1%	2.9%	3.3%	0.6%
Total	11.9%	3619	32,389	9.7%	7.7%	5.6%	6.0%	2.3%

Source: 2017 JRC COLLEEM survey.

As for the second aspect of our proposal, the identification of the characteristics of the labour provided via digital labour platforms, the 2017 JRC COLLEEM survey is more problematic, because although it did ask for the types of tasks performed, it did not link the questions on work characteristics and conditions to any specific category of tasks.

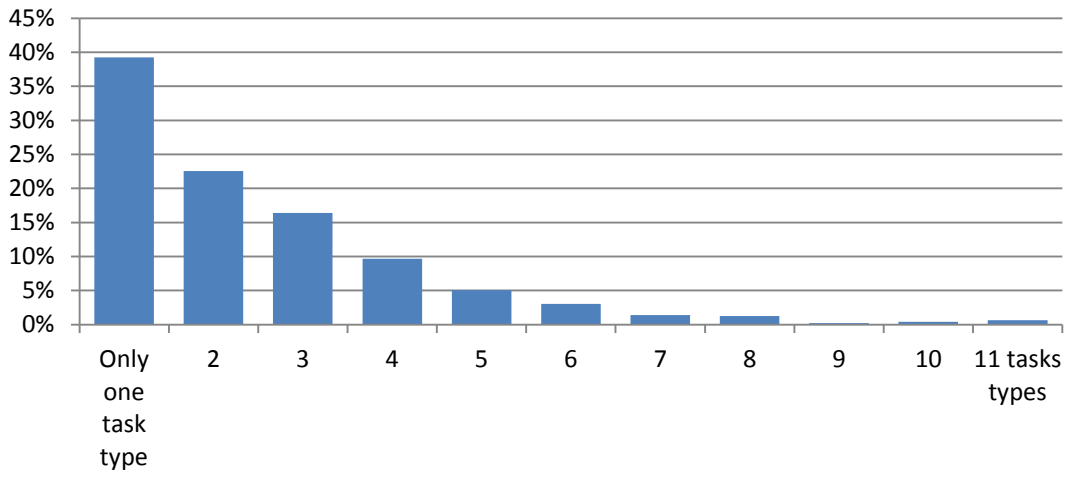
This illustrates the problem of studying platform work as if it were a regular form of employment: whereas in the regular labour market it can be assumed that anyone employed can easily answer questions referring to her main job, someone doing work in the platform labour market is likely to do many different tasks with different characteristics and conditions, and therefore a generic question on the nature or conditions of her work via platform can be really difficult to answer. Figures 2 and 3, also showing results from the JRC COLLEEM survey, illustrate this difficulty.

In Figure 2, we can see the distribution of platform workers by the number of task categories where they have performed some type of work: less than 40% of those identified as platform workers have only provided one type of labour service or task, while the majority have provided two or more. Figure 3 shows the distribution of platform workers by type of task provided, which again illustrates both the diversity of types of labour coordinated via platform and the significant

amount of overlap between them. This diversity makes most of the indicators measuring the attributes of platform work in the 2017 JRC COLLEEM survey problematic, because they cannot be linked to a specific type of work but to all the platform work carried out by an individual worker.

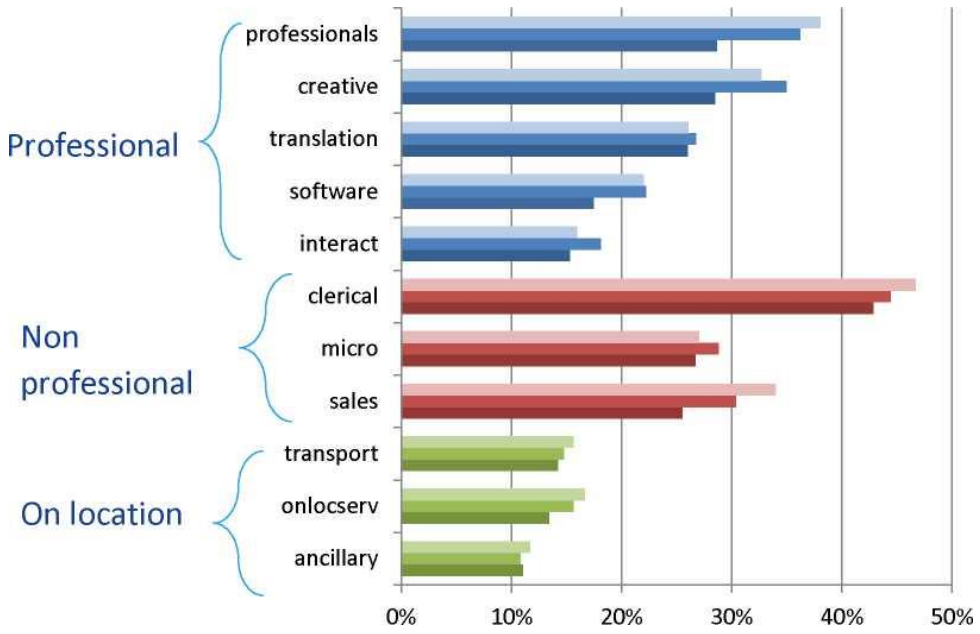
As previously explained, our proposal for future measures of the attributes of platform work (including for the second wave of the JRC COLLEEM survey) is to first identify how many types of platform work did the respondent perform over a specific period, and then explicitly refer the questions on the nature and characteristics of the work to the main task category only.

Figure 2. Number of task categories in which labour services have been provided by respondents.



Source: 2017 JRC COLLEEM survey.

Figure 3. Distribution of respondents by types of tasks provided, distinguishing main, significant and all platform workers.



Source: 2017 JRC COLLEEM survey.

Measuring platform work as labour input

The growth in platform work can also affect the standard measurement of economic activity such as total output, GDP and labour productivity. The current measurement framework does not take into account non-traditional work arrangements or the provision of services directly from workers to consumers. This could lead to an underestimation of both the output produced and the number of hours worked.

In this section, we propose a methodology to measure platform work that mimics the measurement of labour input in national statistics. Labour input indicators are business cycle indicators measuring the quarterly change in labour input used by industry, construction, trade and (other) services. We use Eurostat Short-term business statistics (STS) indicators[9] as benchmarks. STS provide three different indicators for labour input[10]: the number of persons employed (employment), the number of hours worked (volume of work done), and gross wages and salaries.

To provide the three selected indicators in the STS, Eurostat compiles data from numerous sources as statistical surveys, administrative sources, estimations and other non-official sources. By their very nature, platforms monitor and register a significant amount of data on the economic transactions that they coordinate. At the very least, each transaction registered by the platform must include: i) an identification of the supplier of the service (and probably the client); ii) the economic value exchanged, iii) the type of task performed. Very often it will also include some indication of the time spent in the provision of the service and additional information, such as the skills or demographic characteristics of the service provider as well as evaluations of satisfaction or quality for the service provided. If fed into the statistical system, these data can facilitate the measurement of labour input in the platform economy and the corresponding output produced. On the one hand, such measures can complement the measures of platform work as a form of employment proposed in the previous section. On the other hand, they could be directly used to improve the measure of economic activity from a macro-economic perspective, which is currently missing for this form of work entirely.

To test the feasibility of this approach we use data from one of the largest EU digital labour platforms: PeoplePerHour.com[11]. The essential difference between this approach and the one used in the previous section is that now we do not ask workers about the work provided, but we directly monitor their activity and the payments received through the platform.

PeoplePerHour (PPH) is an online freelancing platform matching clients to medium-high skilled workers for the completion of knowledge-intensive tasks. For the current exercise we use a sample of 136,613 tasks performed between November 2014 and October 2016. As explained in section 2, the task is the basic unit of interchange and hence our relevant unit of measurement. Tasks may vary in terms of duration, price and skills. They can be contracted in two different ways: "fixed" tasks are paid a specific amount agreed by the worker and the client independently of the time spent on their completion; "hourly" tasks are paid on the basis of the time spent.

Tasks are classified in 16 different categories: Administrative; Business Support; Creative Arts; Design; Extraordinary; Marketing & PR; Mobile; Search Marketing; Social Media; Software

[9] http://ec.europa.eu/eurostat/web/short-term-business-statistics/overview/sts-in-brief

[10] http://ec.europa.eu/eurostat/statistics-explained/index.php/Labour input indices overview

[11] PPH was founded in London in 2007 and is today operating in 188 countries. It has about 122,000 workers and 90,000 clients.https://www.peopleperhour.com/

Development; System; Translation; Tutorials; Video, Photo & Audio; Web Development and Writing. Some 12% of the tasks do not report the category and we classify them as "Unknown". An additional level of complexity will be to translate the task categories into the correspondent sectors in the statistical classification of economic activities[12] (NACE).

Number of persons employed

According to Eurostat, the number of persons employed is *the total number of persons who work in the observation unit as well as persons who work outside the unit who belong to it and are paid by it (e.g. sales representatives, delivery personnel, repair and maintenance teams). Yet the number of persons employed excludes manpower supplied to the unit by other companies*[13].

As shown in the previous section, platform workers tend to perform tasks in more than one category, even via the same platform. For this reason, we need to trace back each task to a worker to count the total number of active workers of the platform. Each person registered in the platform has a unique numerical identification (ID), and uses it in every interaction with the rest of users. The unique id is registered daily at the country -even city- level and allows us to check for the type of task performed. However, this ID identifies the platform worker on a specific platform, but we do not know if the same individual has registered and is active in other platforms. While this is not usually an issue at firm level in a traditional job, for platform workers the incidence of double counting could be more substantial, leading to overestimates due to multiple accounts for the same individual when measured at the platform level. Another limitation of using information collected directly by a platform is that individuals may register using fake identities or may use one individual identity which hides the work of several people. For example, this could be the case of a design studio, where only one designer registers in the platform, but the work is carried out by the entire studio. In this case, the number of persons employed would be underestimated.

Hours worked

Hours worked is the number of hours actually worked, defined as the sum of all periods spent on direct and ancillary activities to produce goods and services[14]. The objective of this indicator is to show the change in the volume of work done. It represents the aggregate number of hours actually worked for the output during the reference period.

Some platforms -for instance Upwork[15] - record all the time spent by workers in the platform, and pay them only for the time in which they are active. Measuring hours worked presents fewer issues than the number of persons employed. In this case, even if an individual provides services in more than one platform what is taken into account is the actual number of hours worked and it is improbable that an individual could perform work simultaneously in more than one platform. The risk of double counting is therefore minimised or null.

[12] Table 2 in the Annex shows a potential suggestion of correspondence between categories in the platform and sectors in NACE Rev2, plus information on the number of platform workers by category, the number of hours worked and the average gross hourly salary.

[13] http://ec.europa.eu/eurostat/web/products-datasets/product?code=TIN00016

[14] http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossarv:Hours worked

[15] https://www.upwork.com/

Platforms, in general, record the exact time that a task has required, and more accurate measures of labour input can be obtained. However, when this information is not recorded -as for PPH- the number of hours should be approximated. We propose the following approach: as explained above, PPH data comprises two types of tasks, one for which we observe only the agreed wage bill ("fixed") and a second for which we observe only agreed hourly wages. We can decompose wage bill tasks into price (wages) and quantity (time). For this purpose we identified workers who carried out both hourly wage rate and wage bill tasks. This is the case for 57% or 69,511 out of 121,733 wage bill tasks. We divide the value of the wage bills by these workers' observed hourly wage rates to estimate the time spent on these wage bill projects. This gives us an approximation of the number of hours needed to complete a project. To have a comparable measure with Eurostat indicators, we could aggregate each project by the number of hours at the country and quarter level.

Gross wages and salaries

The objective of the wages and salaries index is to approximate the development of the wage and salaries bill in each country. Wages and salaries are defined as *the total remuneration, in cash or in kind, payable to all persons counted on the payroll (including home workers), in return for work done during the accounting period, regardless of whether it is paid on the basis of working time, output or piecework and whether it is paid regularly*[16]. Since usually the payment for the service occurs via platform, those data should be available. Although these are not two exactly homogeneous measures, since remuneration in kind is excluded for platform workers, we think that the comparison could still provide valuable insights.

To conclude, the labour input approach to measure platform work appears less problematic when it comes to the measurement of both hours worked and total wages paid. However, for the measurement of total employment, data collected directly from platforms may suffer from double counting or misreported identities.

A survey aimed at the working age population, as proposed in the previous section, seems to be preferable for measuring platform work as a form of employment.

[16] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Index_of_gross_wages_and_salaries_-_SBS&oldid=160345

Conclusions

Measuring platform work is a formidable challenge. Several methods have been used, returning very different estimates of platform work both in Europe and in the US. However, identifying key advantages and limitations of the different methodologies could pave the way towards better measurement.

Our analysis discussed the advantages and disadvantages of two different approaches in measuring platform work. On one hand we highlight the potential benefits of conducting ad hoc surveys or including questions on platform work on household surveys, such as the Labour Force Survey (LFS) or the ICT survey, so to ensure consistency with official labour statistics. On the other hand, we explore the possibility of requesting platforms to provide data to statistical authorities on the number of persons providing services, number and value of transactions, and hours worked. Both approaches are not free from potential distortions.

In the survey approach, one of the main challenges is to correctly define platform work in a way that respondents will clearly understand. The use of specific platform names could be helpful in this case; however it could be problematic in terms of comparability both over time and across countries. Indeed, platforms may exit or enter the market in different periods, and they may not be active in all European countries. A better approach could be to guide the respondent by asking for specific attributes of the work provided, in particular regarding the use of technology (which also makes the Eurostat ICT survey a valuable candidate to host questions on platform work, asking for example if respondents use a specific app or website to provide their service or to get paid). A second difficulty of the survey approach is the reference period. If, to assure comparability with existing labour force statistics, the time-frame of reference is last week, then there is a high probability of getting very low and unreliable estimates of the phenomenon. A better approach would be to increase the time horizon to measure the prevalence of platform work, and then use additional questions to classify platform workers in terms of the regularity, time intensity and income from their platform work. That is the basis of our first proposal.

The use of alternative sources, such as administrative data or tax data, could be useful to implement an alternative labour input analysis approach, which is the basis of our second proposal. However, as discussed before, while these data may provide consistent estimates of hours worked and total wage paid in platforms, they are less suitable for the estimation of persons employed. A combination of the two approaches (collecting both survey data and register data provided by platforms) would certainly be the most desirable way of measuring the elusive phenomenon of platform work.

References

Berg, J. (2016). Income security in the on-demand economy: Findings and policy lessons from a survey of crowdworkers, *ILO - Conditions of Work and Employment Series* No. 74

Bonin, H. (2017). The Incidence of Platform Work in Germany Analysis of a survey commissioned by the Federal Ministry of Labour and Social Affairs, paper presented at the BMAS-OECD-ISSA Workshop on the Future of Social Protection Berlin, June 12 2017

Cramer, J., Krueger, A. (2016). Disruptive Change in the Taxi Business: The Case of Uber, *American Economic Review,* 106w (5): 177-82.

de Groen, W. P., Maselli, I. (2016). The Impact of the Collaborative Economy on the Labour Market, *CEPS Special Report,* N. 138

European Commission (2017). European Commission Study to monitor the economic development of the collaborative economy in the EU. Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (DG GROW)

European Commission (2016). The Use of Collaborative Platforms. Flash Eurobarometer 438. Brussels: *European Commission.*

Farrel, D., Greig, F. (2016a) Paychecks, Paydays, and the Online Platform Economy: Big Data on Income Volatility*, JPMorgan Chase & CO*.

https://www.ipmorganchase.com/corporate/institute/reportpavchecks-pavdavs-and-the-online-platform-economy.htm

Farrell, D., Greig, F. (2016b). The Online Platform Economy: Has Growth Peaked? *JPMorgan Chase & CO* https://www.jpmorganchase.com/corporate/institute/research.htm

Fernández-Macías, E. (2017). Automation, digitization and platforms: implications for work and employment. Eurofound Working Paper (https://www.eurofound.europa.eu/sites/default/files/wpef17035.pdf).

Görlich, D. (2010) Complementary Tasks and the Limits to the Division of Labour, *Kiel Working Paper* No. 1670

Hall, J., Krueger, A. (2015). An Analysis of the Labor Market for Uber's Driver-Partners in the United States, Princeton University, *Industrial Relations Section Working Paper 587.*

Harris, S., Krueger, A. (2015) A Proposal for Modernizing Labor Laws for Twenty-First- Century Work: The Independent Worker', *The Hamilton Project, Discussion Paper* 201510.

Huws, U., Spencer, N.H., Syrdal, D.S., Holts, K. (2017). Work in the European Gig Economy: Research Results from The UK, Sweden, Germany, Austria, The Netherlands, Switzerland and Italy, *FEPS, UNI Europa, University of Hertfordshire*

Ipeirotis, P. G., (2010). Demographics of Mechanical Turk. *NYU Working Paper,* CEDER- 10-01. Available at SSRN: https://ssrn.com/abstract=1585030

Katz L.F. and A. B. Krueger (2016). The rise and nature of alternative work arrangements in the United States, 1995-2015, *NBER Working Paper 22667.*

Kenney, M. & J. Zysman.(2016). The Rise of the Platform Economy, *Issues in Science and Technology* 32, no 3

Kuek, S.C., Paradi-Guilford, C., Fayomi, T., Imaizumi, S., Ipeirotis, P., Pina, P., Singh, M. (2015) The Global Opportunity in Online Outsourcing, *World Bank report* n. ACS14228

Lee, M. K., Kusbit, D., Metsky, E., & Dabbish, L. (2015). Working with machines: The impact of

algorithmic and data-driven management on human workers. *In Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems* (pp. 16031612).
Lepanjuuri, K., Wishart, R., Cornick, P. (2018). The Characteristics of Those in the Gig Economy, *BEIS Research Paper:* 2018 no. 2

Lincoln J. R. & D. Guillot. (2004). "Durkheim and Organizational Culture." IRLE Working Paper No. 108-04. http://irle.berkeley.edu/workingpapers/108-04.pdf

McKinsey Global Institute (2015). A labor market that works: Connecting Talent with Opportunity in the Digital Age

Pesole, A., Urzì Brancati, C. Fernández-Macías, E., Biagi, F. González Vázquez, I. (2018). Platform workers in Europe. Evidence from the COLLEEM Survey, *JRC Science for Policy Report JRC112157,* Joint Research Centre http://dx.doi.org/10.2760/742789

Robles, B. J., and M. McGee (2016). Exploring Online and Offline Informal Work: Findings from the Enterprising and Informal Work Activities (EIWA) Survey. *Finance and Economics Discussion Series* 2016-089. Washington: Board of Governors of the Federal Reserve System, November, available at
https://www.federalreserve.gov/econresdata/feds/2016/files/2016089pap.pdf .

Statistics Canada, 2017. The sharing economy in Canada, Statistics Canada. Available here: http://www.statcan.gc.ca/daily-quotidien/170228/dq170228b-eng.htm

Annex

Table 1. Studies measuring platform work
Table 2. Workers, hours and wages by category

Table 1. Studies measuring platform work

Authors	Term	Approach	Measure	Countries	Platform workers (%)
1. Bonin (2017)	Platform work (and crowd-working)	BMAS Survey on new types of work. Omnibus telephone survey; Sample: 8,452	**Scope:** anytime **Identifier**: currently doing platform work, done in the past, anyone else in the family **Age range:** 18+	Germany	3.1%
Question :	1. Are you currently doing this kind of work? 2. If you are not doing it now, have you done so in the past? 3. Is anybody else in your household doing this kind of work now?				
2. Flash Eurobarometer Survey (2016)	Collaborative platforms	Survey: Ad hoc telephone interviews; Sample: 14,050	**Scope**: ever/ regularly; both labour and capital platforms **Identifier**: service provided (once or more frequently)	EU28	5.4% (a third or the 17% of those who heard it) About 4% at least once a month
Question:	1. A collaborative platform is an internet based tool that enables transactions 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. (Filter: If the respondent has visited the platforms) 2. Have you ever provided services on these platforms?				
3. Huws et al. (2017)	Crowd workers	Ipsos-MORI as part of its regular I-Omnibus online survey; Additional face to face in UK and CATI in Switzerland. Sample: 14,859	**Scope**: Ever/at least monthly/at least weekly **Identifier**: paid work via an online platform **Age range:** varies by country; from 16-65 in Sweden to 15-79 in Switzerland	Austria, Germany, Italy, The Netherlands, Sweden, Switzerland and the UK	Between 9% (UK) and 22% (Italy) At least 50% income: 2.9% total sample
Question:	Ever sold [your] labour via an online platform in any of the following three categories (The names of platforms were varied in each country depending on which sites were considered to be best known locally) 1. Carrying out work from your own home for a website such as Upwork, Freelancer, Timeetc, Clickworker or PeoplePerHour. 2. Carrying out work for different customers somewhere outside your home on a website such as Handy, Taskrabbit or Mybuilder.				

Authors	Term	Approach	Measure	Countries	Platform workers (%)
	3. Carrying out work involving driving someone to a location for a fee using an app or website such as Uber or Blablacar				
4. Lepanjuuri et al. (2018)	Gig workers /gig economy	Two survey vehicles: the NatCen Panel and YouGov Omnibus survey (online); Sample: 2,184 ; 11,354 Estimates of the size come from NatCen	**Scope**: last 12 months; paid work **Identifier**: services provides to make money via website or app (ex. Of specific platforms) **Age range**: 18+	UK	4.4%
Question :	Thinking about **the past 12 months** (since July 2016)... Which, if any, of the following have you done in order to make Money, using a website or app? 1. Provided transport using your vehicle (for example via Uber, Hailo, etc.) 2. Provided food delivery services (for example via Deliveroo, UberEATS, etc.) 3. Provided courier services (for example via CitySprint, AnyVan etc.) 4. Performed short-term jobs found through the website or app (for example via TaskRabbit, Upwork, PeoplePerHour, Fiverr, etc.) 5. None of the above				
5. Statcan 2017 (cited in Forde et al, 2017)	Platform economy	Official Labour Force Survey included a set of questions concerning both spending within and earnings from the platform economy	**Scope**: November 2015- Oct 2016 **Identifier**: "ride services" (such as Uber and Lyft) **Age range:** 18+	Canada	0.3%
Question :	In the past 12 months, did you offer ride services such as Uber, Lyft, etc.?				
6. Katz and Krueger(2016)	Contingent workers / gig workers	The RAND-Princeton Contingent Work Survey - online Sample: 3,850	**Scope**: Main job; **Identifier**: paid work through online app (few examples given) **Age range:** 18+	US	0.5%
Question:	1. Did you work on any gigs, HITs or other small paid jobs last week that you did not include in any of your answers so far? 2. Did any of those gigs, HITS or other paid jobs you worked on last week involve working through an online app, such as TaskRabbit or Uber?				
7. Pesole et al. (2018)	Platform workers	Ad hoc online survey; non probability quota sampling. Sample: 32,200	**Scope**: Any PW **Identifier**: paid work providing services via digital labour platforms (online and on-location); excludes capital platforms (Airbnb) or other	Germany, Netherlands, Spain, Finland, Slovakia, Hungary,	- ever done platform work: 9.7% - platform work as main form of

Authors	Term	Approach	Measure	Countries	Platform workers (%)
			types **Age range:** 16-74	Sweden, UK, Croatia, France, Romania, Lithuania, Italy, Portugal.	employment: 2.3% Estimates are Adjusted to Account for Sample selection bias (high internet usage)
Question:	1. Have you ever gained income from any of the following online sources? a. Providing services via online platforms, where you and the client are matched digitally, payment is conducted digitally via the platform, and work is location-independent, web-based (e.g. Upwork, Freelancer, Timeetc, Clickworker, PeoplePerHour and others) b. Providing services via online platforms where you and client are matched digitally, and the payment is conducted digitally via the platform, but work is performed on-location (e.g. Uber, Deliveroo, Handy, TaskRabbit, MyBuilder and others)				
8. Robles and McGee (2016)	Enterprising and informal work	Enterprising and Informal Work Activities (EIWA) survey; Representative survey of the adult US population.	**Scope:** qualifying respondents - yes to self-employed, freelancer, contract worker, or independent consultant in the previous six months (36% or total sample) **Identifier**: earning income through a number of online platforms **Age range:** 18+	US	12% of the qualifying respondents (who represent 36% of the population) So 4.3% of the adult population
Question:	In the last 6 months, have you earned any money using any of the following Internet sites or mobile apps: Amazon Mechanical Turk; Care.com; Craigslist; eBay; Etsy; Fiverr; Freelancer; Uber; Lyft; Sittercity; Task; Upwork; Other websites which enable informal paid or side work activities (please specify)				
9. Harris and Krueger(2015)	Independent/ gig workers	They derived a rough estimate based on searches on Google Trends (www.google.com/trends/). First they tracked the frequency of searches containing the name of one of 23 platforms (that they list in the appendix). They then normalized the data relative to searches for the term	**Scope:** roughly a year (2015) **Identifier:** Google Trends searches on 23 different platforms	US	0.4% - 1.5%

Authors	Term	Approach	Measure	Countries	Platform workers (%)
		"Uber" each week. Finally, they estimated the size of the "gig" economy deriving workers in each of the 23 platforms as a proportion of Uber drivers (since they knew the number).			
10. McKinsey (2015)	Online talent platforms	Information collected from publically available data- company reports, blogs etc. They simply summed up the number of active people on 10 platforms (2.8 million) and divided it by the US working age population.	**Scope:** number of people registered with one of 10 platforms **Identifier:** google searches for platforms	US	>1%
11. Farrell & Greig (2016 a, b) JPMorgan	Online Platform Economy (OPE)	Information on how many Chase customers received income from platform work in an anonymised sample of 240,000 individuals	**Scope**: at least once between October 2012 and June 2016 **Identifier**: Income received at least once over the 36 months from one of 42 distinct platforms	US	Between 0.5% and 1.5%
12. De Groen and Maselli (2016)	Platform work	Same methods as Harries and Krueger (online search data from Google and extrapolated data on a number of active Uber drivers)	**Scope:** online collaborative labour platforms and remuneration takes place in hard currencies. **Identifier**: google searches	EU	0.05%
13. European Commission (2017) - DG GROW	Collaborative economy	The authors estimated employment differently accord to the sectors: for Accommodation, Finance, and online skills, they calculated average turnover per employee in sector using Eurostat data. For the Transport sector, they estimated an average ratio of revenue per employee for the platforms with value. For all platforms, it was assumed that they had the same number of employees per revenue like the ones with data	**Scope**: people providing services through online platforms. **Identifier**: Average turnover per employee in sector Sector annual turnover Sector employment Service provider employment per platform Service provider revenue per platform Average ratio of revenue per employee	EU	0.179%

Table 2. Workers, hours and wages by category

Category	Potential correspondence with NACE Rev. 2 activities	Number of different workers	Number of hours hired	Average hourly gross salary
Administrative Support	N. Administrative and support service	2,400	27,114.70	17.73
Business Support	N. Administrative and support service	2,579	36,055.06	36.06
Creative Arts	R. Arts, entertainment and recreation	791	7,188.81	24.82
Design	R. Arts, entertainment and recreation	7,557	183,241.70	25.29
Extraordinary	S. Other service	210	1,475.69	24.70
Marketing & PR	K. Financial and insurance	1,769	20,571.64	27.56
Mobile	J. Information and communication	673	51,856.08	18.88
Search Marketing	K. Financial and insurance	1,045	15,651.66	25.96
Social Media	J. Information and communication	1,027	8,823.34	23.00
Software Development	J. Information and communication	1,925	56,814.46	26.75
System	M. Professional, scientific and technical	1,102	18,867.71	30.42
Translation	N. Administrative and support service	1,332	25,250.73	19.17
Tutorials	M. Professional, scientific and technical	231	1,516.61	24.39
Video, Photo & Audio	R. Arts, entertainment and recreation	2,566	44,859.68	30.70
Web Development	J. Information and communication	5,811	252,995.60	24.13
Writing	M. Professional, scientific and technical	3,597	58,864.88	27.43
Unknown	-	5,492	145,025.60	28.61

Source: Data provided by PPH. Figures in absolute values

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