Counting gigs

How can we measure the scale of online platform work?

Agnieszka Piasna

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Contents

Abstract

The potential transformation of labour markets by the emergence of online labour platforms has triggered an intense academic, media and policy debate, but its true scale remains speculation. Nevertheless, adequate policy responses hinge on a good understanding of dynamics – something that will only grow in importance with the labour market crisis created by the COVID-19 pandemic. With technologically enabled remote work, growing demand for services such as food delivery or care, as well as rising unemployment and the financial strain on many workers, platform work may resume its rapid growth. Therefore, there is a need for good quality data on the prevalence of platform and other forms of precarious work in society.

This working paper provides a critical assessment of different approaches to counting gigs; that is, estimating the scale of engagement in platform work in the general population. The aim is to examine the main obstacles encountered in previous studies, the reasons for surprising or contradictory results and possible sources of error, but also the lessons that can be learned for future research. This is illustrated with key research in this area, ranging from large projects conducted by national statistical offices to smaller scale independent research, from national to (nearly) global scale.

Introduction

Over recent years, the emergence of online labour platforms that use digital technologies to match workers with clients on a per-task basis has sparked an intense debate about their economic and social implications. Research in this area has exploded equally rapidly, primarily in the form of qualitative or case study investigations, on the issues that are most captivating of the imagination, such as algorithmic management, extremely flexible work models, the dismantling of long fought-for worker protections, legal cases or worker struggles (for example, Berg and De Stefano 2017; Drahokoupil and Piasna 2019; Graham *et al.* 2017; Vandaele *et al.* 2019; Wood *et al.* 2019). However, little is still known about the true scale of the phenomenon of platform work which is especially puzzling given that, as opposed to the traditional informal sector, all transactions mediated by online platforms are digitally recorded. Thus, questions on the proportion of workers engaged in platform work, whether they differ from the general workforce and the countries in which they are more common, remain largely unanswered (Codagnone and Martens 2016; Healy *et al.* 2017). Existing official labour market statistics are not well-suited to measuring the online platform economy as they are generally not sufficiently sensitive to capture sporadic or secondary employment, while they also fail to distinguish it from other economic activities. Ad hoc modules added to national employment surveys tend to use very different questions and are thus difficult to compare, while rare cross-national surveys provide such divergent results that they raise even more questions than they set out to answer (see discussion in Piasna and Drahokoupil 2019).

This paper provides a critical assessment of the different approaches to counting gigs, seeking to come to an estimation of the scale of engagement in platform work within the general population (see also Piasna 2021). The aim is to examine the main obstacles which have previously been encountered, the factors which explain surprising or contradictory results, and the potential errors involved, but also to explore the lessons learned for future research. This is illustrated with key research studies in this area, conducted by national statistical offices and independent researchers, and on a national and (nearly) global scale. The analysis ranges from various examples of the use of secondary data, produced in abundance by simple virtue of the operations of the platforms, to the collection of primary data through dedicated surveys. It is not an exhaustive review of all the studies carried out to date, but rather an analytical review of various approaches illustrated with a selection of examples.

Abundance of data but question marks over access

The paradox in measuring the platform economy is that, although its operations generate a wealth of data, with all transactions being digitally recorded, one of the biggest unknowns is still the scale of platform work (Codagnone *et al.* 2016). Every gig mediated by online labour platforms leaves a digital trace containing information such as the nature of the task, the compensation provided, the number of hours worked or tasks completed, and the identity both of the requester or client and of the worker. A good starting point for a review of methods for measuring the platform economy are thus initiatives that have attempted to access such data, either directly from the platforms themselves or by tapping into other sources of big data generated by their operations.

In general, platforms are highly protective of their proprietary databases on work and compensation flows and thus research that uses such data is scarce. One of the early examples is a study by Hall and Krueger (2018), who used anonymised administrative data from Uber on the number of drivers and their work histories, schedules and earnings covering the period 2012–2014 in the US market. Its strength undoubtedly lies in charting in great detail the extent of work for one of the largest platforms. However, as the study was carried out at Uber's request and one of the authors worked for Uber Technologies at the time, it remains unattainable for independent researchers to replicate such an analysis over time or in other countries. Another example of the use of administrative data is a study of Deliveroo riders in Belgium carried out by Drahokoupil and Piasna (2019). In this case, a rare opportunity to access comprehensive administrative records containing information on hours worked and the pay, age, gender and student status of workers was based on co-operation with SMart, an additional intermediary that hired Deliveroo riders and billed the platform on their behalf. However, Deliveroo ended its agreement with SMart soon after the research was carried out, so such data collection cannot now be repeated.

Insofar as access to the administrative records of one platform provides the precise number of workers on that particular platform, and usually allows the separation of registered users from active ones, it can serve as a basis for estimates of the size of the platform economy at national level. Nevertheless, such estimates are extremely rough. A complete picture of the platform workforce would require information from all platforms and some indication on the scale of overlap; that is, how many workers are registered on more than one platform (for example, Aleksynska *et al.* 2019 showed that, among platform

workers in Ukraine, only about one-quarter of those registered were in fact active while many were registered on several platforms). As this is currently unattainable, other sources of data can be used to impute missing information. Kuek *et al.* (2015) complemented the publicly available data disclosed by online labour platforms with expert interviews; while Harris and Krueger (2015) supplemented data from Uber on the number of workers with the frequency of Google searches for the names of selected labour platforms. Their approach rested on the assumption that the number of workers providing services through a platform is proportionate to the frequency of its Google searches, even though the latter may be driven by a variety of factors, including media interest, litigation or academic research, and are likely to be skewed in favour of the most recognised platforms. Nonetheless, Harris and Krueger's (2015) conclusion that labour platforms accounted for 0.4 per cent of total employment in the US was very close to the results from other studies of that period.

Digitally mediated transactions also leave records outside the platform, such as in financial institutions or, at least in theory, in tax records. A rare example of the use of tax returns data is a study by Collins *et al.* (2019), tracing independent work mediated by the 50 biggest online labour platforms in the US between 2010 and 2016. It revealed that, by 2016, about one per cent of the US workforce registered income from platform work, even though it could not, by design, include informal revenues and those falling below a certain threshold. An interesting illustration of the use of financial records is a report by Farrell and Greig (2016) from JPMorgan Chase Institute. Having access to a full database of the clients of a major bank in the US, they counted how many accounts received any payments from one of 30 online platforms (expanded to include 128 platforms in a follow-up study by Farrell *et al.* (2018)). Their analysis revealed that, by 2015, one per cent of adults earned income from online platforms in the current month (0.4 per cent on labour platforms) and 4.2 per cent had done so in the past three years. The clear advantage of such approaches lies in the large number of platforms that can be included in the analysis and the possibility of replicating and repeating measurements over time. However, such studies will miss payments not coming directly from platforms' accounts (i.e. through PayPal or Amazon vouchers) and, in the case of bank records, produce data not strictly at an individual level as families may have joint bank accounts, also raising ethical concerns where data are used without clients' explicit consent.

Another approach to gathering the data produced by platforms, which in principle is not contingent on access to exclusive sources such as banks and does not raise ethical concerns, is web 'scraping' – automatically accessing and downloading publicly available data from the platform's web user interface. The most comprehensive initiative of this sort to date is probably the Online Labour Index (OLI) produced by the Oxford Internet Institute (Kässi and Lehdonvirta 2018). The index tracks in near-real time the number of new vacancies (i.e. projects or tasks) posted on five major English-speaking online labour platforms. It is possible to determine from which country the vacancy was posted and in which occupational category it falls, while continuous up-

dating of the figures provides a consistent time series. However, as the OLI and other similar projects (see, for example, Ipeirotis 2010) count posted job offers and not the number of workers completing them, they might confuse an increasing fragmentation of tasks for an increase in the size of the platform economy. It is also difficult to grasp the actual extent of platform work without information on compensation for posted tasks, as single tasks can vary greatly in the amount of labour input required and pay levels, while some tasks might also be completed by multiple workers. Finally, the authors of the OLI acknowledge that this measure of online labour utilisation is incomplete as it fails to capture all new vacancies, and thus they choose to present it as an indexed trend rather than in terms of the absolute numbers of vacancies. Consequently, while valuable in mapping trends in online gig work and its occupational heterogeneity, the OLI does not provide answers to the scale of platform work.

Therefore, the use of secondary data generated by platforms' operations seems a good way to sketch the contours of the platform economy, although it is not best suited for mapping the prevalence of platform work at an individual (worker) level. To investigate how widespread are experiences with platforms, how often and to what extent individuals engage in platform work and the role of this type of work in supporting their livelihoods, a collection of primary data is necessary. This has been typically done through social surveys.

Collection of data through surveys

Data on the involvement of individuals in the labour market, including information on the forms of employment and hours worked, are typically derived from official labour market statistics. Ideally collected through frequent large-scale population surveys with methodologies that are carefully designed and consistent over time, they are considered the gold standard of labour market statistics. However, in principle, they risk overlooking a large chunk of platform work because of the way work and employment are defined by national statistical offices. According to the universally-applied ILO guidelines, only those who worked for pay for at least one hour in the previous week (or day) are counted as employed. This definition fails to capture those who engage in platform work only sporadically, or who regularly perform platform work but who did not do so during the reference week. Moreover, the focus of most official employment statistics is on the main paid job (Gazier and Babet 2018) while platform work is, in the majority of cases, a supplementary paid activity (Hall and Krueger 2018; Piasna and Drahokoupil 2019).

Nevertheless, there have been attempts to gauge, from existing official labour market statistics, the size of the platform workforce or the impact of digitalisation on the labour market more broadly, for instance by looking at the extent of freelance work, solo self-employment or multiple jobholding (see, for example, the use of EU-LFS by Eichhorst *et al*. 2016; Piasna and Drahokoupil 2017). While these non-standard forms of work might, to some extent, overlap with the platform economy, only dedicated questions on platform work can provide sufficiently accurate estimates.

National statistical offices, however, have long been rather hesitant to include direct questions on platform work in their conventional labour force surveys. This is mostly motivated by a very small target population, and thus an expected very low rate of response to these questions, as well as a lack of an agreed definition and operationalisation of platform work (see, for example, ONS 2017). Another challenge faced by labour force surveys is that employed persons are assigned to sectoral and occupational classes, yet there is a lack of guidelines on where to position platform work in the ISCO and NACE systems in current usage. This would prevent platform work from being fully integrated into the existing statistical frameworks. For instance, Uber could fall into web portals in the broad category of information and communications, but could equally well fall into taxi operations in the transportation and storage sector were one to rely on court rulings that consider

Uber as an enterprise that provides transportation services (cf. Uber case, ECLI:EU:C:2017:364).

Despite these concerns, there have been attempts to measure platform work with dedicated surveys, or ad hoc modules to official data collections. In what follows, the three steps that need to be taken in the design of such studies and which play a major role in their success, or lack thereof, are discussed: the definition of concepts; the formulation of questions; and the selection of respondents.

Conceptual clarity and shared definitions

Conceptual clarity and agreed definitions are the first prerequisite for a successful measurement of any concept in labour market statistics (see discussion in Piasna *et al.* 2017). The very slow progress in measuring the platform economy through harmonised labour force surveys at EU level is a good illustration of this point.

The major hurdle that has slowed progress in devising harmonised surveys with questions on platform work is a lack of conceptual clarity as to what exactly should be measured. The European Commission (2020) continues to use the term 'online platforms' in a very broad sense, which includes search engines (for example, Google), social media (for example, Facebook) and e-commerce (for example, Zalando). Online labour platforms as intended in the academic literature (for example, Vallas and Schor 2020) are referred to by the loose term 'collaborative economy', which includes both for-profit and not-for-profit activities encouraging meaningful peer-to-peer interactions and trust (European Commission 2016; see also Hawley 2018).

Eurostat, one of the Directorate-Generals of the European Commission, launched its efforts to devise a measurement of platform work starting from the same terminology and conceptual framework. In order to operationalise the fuzzy concept 'collaborative economy', a special Eurostat task force narrowed it down to digitally mediated transactions that make temporary use of the idle capacity of assets and/or labour, without a change of ownership or ongoing employment relationship (Eurostat 2018). However, the use of the idle capacity of assets as a part of the definition created obvious difficulties in drawing a boundary to the collaborative economy as it opens the possibility that work carried out through the same platform may be classified either as a collaborative or a non-collaborative transaction. In the case of Uber, if a car was bought or leased with the primary aim of working for the platform, it would not be a collaborative economy activity but, if the vehicle was primarily intended for personal use, then it would be part of the collaborative economy. Drawing a distinction between freelance services provided through a platform and those obtained via traditional agencies using a digital marketplace would also be very difficult. Given that even the experts involved in conceptual work on measuring the collaborative economy have found it very tricky to classify particular activities (Eurostat 2018; see also ONS 2017), such a conceptual

framework is simply not suitable for the formulation of survey questions that would prompt respondents reasonably to classify their work.

The inclusion of normative and fairly subjective features in the definition of the collaborative economy, such as the use of idle capacity or peer-to-peer transactions, has turned out to be a significant barrier to devising official and comparative measurements of platform work at EU level. This contrasts with a burgeoning academic literature and independent research on platforms that have proposed reasonably consistent definitions and classifications of the platform economy (for example, Berg *et al.* 2018; Bergvall-Kåreborn and Howcroft 2014; Drahokoupil and Piasna 2017; Vallas and Schor 2020; Wood *et al.* 2019). In the literature, there is generally little disagreement as to which intermediaries can be categorised as online platforms, with the main challenge faced by empirical attempts to measure platform work being one of how to convey these definitions to respondents and mould them into a survey question.

Formulating questions

It is relatively easy to describe any given online labour platform by listing the features it shares with other platforms, such as digital intermediation, work based on discrete and usually short tasks, a lack of a long-term employment relationship or digital payment processing. An obvious choice in formulating survey questions about platform work is thus to start from the defining features of platforms and ask respondents whether they have done work of this sort. However, this has proven remarkably difficult. Describing an online labour platform in plain language, in a concise manner and in a way that avoids any confusion with job search websites, professional social networks, online search engines or the use of ICT technology at work in a standard job has been particularly challenging.

An approach based on formulating a direct question as to whether respondents work on online platforms was chosen, among others, in the Collaborative Economy (COLLEEM) survey, fielded in 16 EU countries (Pesole *et al.* 2018; Urzí Brancati *et al.* 2020). Respondents were asked whether they gained income from 'providing services via online platforms, where you and the client are matched digitally, payment is conducted digitally via the platform', further distinguishing between work that is 'location-independent (web-based)' and work that is 'performed on location' (Pesole *et al.* 2018: 14).

The risk with such questions is that they are rather complex and crammed with technical terms, and thus not easy to understand for non-specialist audiences. Understanding can be improved with simpler and less specific wording, but at the expense of the precision achieved with the use of jargon. Such simpler wording can be found in the 2017 Contingent Worker Supplement (CWS) to the US Current Population Survey (Current Population Survey staff 2018). Respondents were asked two similar questions, one about on-location and the other about remote platform work. The former was formulated as fol-

lows: 'Some people find short, in-person tasks or jobs through companies that connect them directly with customers using a website or mobile app. These companies also coordinate payment for the service through the app or website. Does this describe any work you did last week?'. There might be no jargon used, but the question is nonetheless rather complex and, at the same time, not very precise. A cleaner working through a traditional work agency that assigns tasks electronically could probably feel this describes their job too (for similar issues with classification, see the ad hoc module to the French LFS in Gazier and Babet 2018). Another example of a similar approach is a survey commissioned by the Federal Ministry of Labour and Social Affairs in Germany, which used a long (seven sentence) definition of platform work, albeit written in an accessible language and providing respondents with many examples of tasks that constitute platform work followed by the question 'Do you currently do any paid work assignments that you obtained via the Internet or an app?' (Bonin and Rinne 2017; own translation).

One way to assess whether such questions work well is to test them – by administering the questionnaire to platform workers and others and then asking how they understood the questions and what guided their responses. Such extensive cognitive testing preceded the fieldwork for the 2017 CWS but did not spark major concerns. Nonetheless, the survey resulted in many incorrect 'yes' answers (Current Population Survey staff 2018) according to records of the interviews. The questions were so complex that respondents did not seem to understand them, often soliciting prompts from interviewers who then gave examples of tasks (driving own car, data entry, etc.). As it turned out, these were often mistaken for tasks performed in the main offline job. After careful data cleaning, only about one-quarter of positive responses were considered valid by the CWS team; without such a revision, the survey would thus have overestimated the extent of platform work by a factor of four.

The German survey also provides some indication of the accuracy of responses. Respondents who admitted having ever done platform work were then asked to give the name of the platform they used. This revealed that the vast majority (about three-quarters) were false positives, with respondents citing websites and apps such as eBay, WhatsApp, Facebook, LinkedIn or Google, as well as job offers received in an email (which might well show an inability to name a particular platform but does not exclude platform work in principle), or their own website (Bonin and Rinne 2017: 26–27). A misclassification of websites and apps as platforms has surfaced also in other studies using open questions to validate self-assessment as a platform worker. For instance, in an online survey carried out in 12 European countries, about one-third of respondents wrongly indicated eBay, Allegro, Facebook or Google as examples of sharing economy platforms (Newlands *et al.* 2018).

In view of such difficulties, another approach is to ask respondents clearly whether they work through a given platform citing its name. This would avoid any issues of misclassification. Starting from such a premise, Statistics Finland added a question on platform work to the Labour Force Survey in 2017.

The wording was simple: 'Have you during the past 12 months worked or otherwise earned income through the following platforms', with multiple choice responses '1. Airbnb; 2. Uber; 3. Tori.fi/Huuto.net; 4. Solved; 5. Some other (which?); 6. None of the above' (Sutela 2018). The third option listed the best-known online marketplaces in Finland, asked separately to avoid confusion. The fifth option allowed respondents to indicate the name of the company but, as in the studies described above, the most common responses were Facebook and websites advertising cars or homes for sale.

While simple, such questions are not well suited to analysis across countries and over time, as the platform economy is in constant flux with new actors emerging and old ones rebranding or disappearing. Such questions would need to be adapted over time and to platforms operating in particular national markets, limiting the comparability of findings across time and space. Moreover, as we are interested in mapping the entire platform economy, not just one or two platforms, a survey question should ideally list as many names of platforms as possible. However, apart from creating an unfeasibly long questionnaire, such a list would never be complete as it risks omitting platforms with which a researcher might not be familiar when designing the survey.

There are, of course, alternatives in between these two extremes of either asking very general questions with complex definitions or very specific yet simple questions naming a handful of platforms. Katz and Krueger (2019), who conducted their own version of the US CWS in 2015, asked a series of filtering questions starting from a general 'Do you do direct selling to customers?', and then narrowed this down to selling through an intermediary and, finally, through an online intermediary, citing Uber and TaskRabbit as examples. Such a way of formulating questions gave an estimated 0.5 per cent of the US workforce engaged in the online platform economy, almost identical to the estimates of other studies (Farrell and Greig 2016; Harris and Krueger 2015). This is, perhaps, a good solution to avoid overestimation arising from an over-complex question, on the one hand, and a narrow focus only on a handful of platforms, on the other.

Such an approach can be further expanded by distinguishing between different types of tasks and the skill content of gigs. For instance, a special module of the Swiss Labour Force Survey in 2019 differentiated between four types of services with two examples of company names for each: accommodation rental; taxi services; the selling of goods; and the provision of other services (OFS 2020). Huws *et al.* (2019), in a survey in 13 EU countries, asked about 13 separate online activities, two of which were expected to capture platform work. They asked about 'looking for work' online and gave examples of the names of eight online labour platforms (for example, Upwork, Freelancer, Handy). Those who responded positively were then asked what type of work this was. However, this probably did not eliminate misunderstandings completely. It is still conceivable that a respondent assumed, for example, that looking for work online included not just using the platforms given in the examples but also job search websites or any other online information gathering.

Recognising the difficulty of distinguishing platform work from other forms of using the internet to generate income, the Internet and Platform Work Survey of the European Trade Union Institute (ETUI) (Piasna and Drahokoupil 2019) positioned the platform economy in a wider labour market and economic context. The approach adopted here is to look also at other forms of economic activity that are mediated (to a different degree) by digital technologies and which represent 'gigs' in the sense that they are not based on standard dependent employment contracts (see Vallas and Schor 2020).

The ETUI survey, thus far conducted in five CEE countries and with a second EU-wide wave planned for early 2021, first asked respondents about internet work (a broad range of paid activities that can be found or carried out online, typically on a freelance basis), and then about platform work *sensu stricto*. The question about internet work asked 'Some people use websites or mobile apps to find work and generate income. How often, if at all, do you do each of the following?', listing ten types of paid activity such as accommodation rental, taxi services and freelance IT work, but also content production/creation and the generation of income as influencers through blogging and social media. This was followed by a question about platform work which contained a detailed description of online labour platforms using fairly simple language: 'Online platforms are internet websites or apps through which workers can find short jobs or tasks, such as IT work, data entry, delivery, driving, personal services, etc. Online platforms both connect workers with customers and arrange payment for the tasks. They usually charge a fee for each transaction'. It then gave names of the most recognisable platforms, which were adapted to each country, and asked people to exclude accommodation rental and the sale of goods.

The relative success of these latter approaches is not straightforward to judge as there is no additional information on testing that would allow an examination of how the questionnaires worked, while their results are remarkably diverse. On the one hand, the ETUI survey (Piasna and Drahokoupil 2019) showed that between 0.4 per cent of respondents in Poland and 3.0 per cent in Hungary engaged in platform work at least monthly. Similarly, in the Swiss survey (OFS 2020), 0.4 per cent of the population reported having worked via an internet platform in the past twelve months (0.1 per cent provided taxi services and 0.3 per cent other services), while only 0.2 per cent provided regular and consistent services via a platform. This contrasts with the Huws *et al.* (2019) survey which showed that, in Switzerland, as much as 12.7 per cent of the population engaged in platform work on a monthly basis. In other countries the results were also generally very high, ranging from 5.7 per cent in the UK to a whopping 33.9 per cent in Czechia (Huws *et al.* 2019).

However, while we cannot dismiss the role of variations in the questionnaire, the method of selecting respondents to take part in the survey is a more likely explanation of these disparities in results.

Sampling of respondents

In studies that focus on platform workers and which set out to examine their working conditions or pay, for instance, the aim is to get good representation *within* the group of platform workers. The sample can then consist entirely of those who work on platforms and the challenge, therefore, is to recruit as many of them as possible to the study. An essentially different approach needs to be taken when the aim is to map the true prevalence of platform work in the population as a whole. In such a case, the sample of respondents should be as close a representation of the general population as possible, with everyone having equal (and known) chances of being selected in a process called random probability sampling (Groves 1989).

Random probability sampling offers the most inclusive, robust and representative methodology and has been used in collecting official labour market statistics, including in the ad hoc modules on the platform economy in the Finnish (Statistics Finland 2018), French (Gazier and Babet 2018) and Swiss (OFS 2020) labour force surveys. It has also been used to select a nationally representative sample for the CWS in the US (Current Population Survey staff 2018), as well as in two big UK survey projects (Balaram *et al.* 2017; Lepanjuuri *et al.* 2018). Remarkably, the ETUI Internet and Platform Work Survey (Piasna and Drahokoupil 2019) is the only study thus far that has used random probability sampling in a comparative cross-national analysis of platform work. What all these studies have in common are quite consistent results that place the prevalence of platform work generally around 0.5–5.0 per cent of the adult population. However, such studies are also relatively costly and are thus not likely to be undertaken frequently or on a large cross-national scale.

This has prompted the use of other, essentially cheaper and faster, methods of data collection. Among them, non-probability online samples have been used most frequently (for example, Huws *et al.* 2019; Katz and Krueger 2019; Newlands *et al.* 2018; Pesole *et al.* 2018). However, these suffer from a number of limitations and inherent biases, and require a thorough methodological understanding to tackle likely sources of error (see, for example, Lehdonvirta *et al.* 2020).

In general, as long as internet access and use are not universal, online surveys will exclude large groups of people (for example, older citizens or ones facing poverty); groups that, at the same time, have no internet access (or are very infrequent internet users) and which are less likely to engage in platform work. This will lead to an overestimation of the prevalence of platform work among the general population. There have been attempts to correct for such bias. For instance, the COLLEEM team used quota stratified sampling and post-stratification weights based on age, gender, education and the proportion of frequent internet users in a country (Urzí Brancati *et al.* 2020). Indeed, Schneider and Harknett (2019), having compared non-probability web-based surveys carried out on Facebook with standard probability samples, concluded that post-stratification weighting on the basis of demographic characteristics yielded fairly accurate results.

Nevertheless, such adjustments do not address the major methodological weakness of existing online surveys, namely that respondents are usually recruited via commercial polling panels and participate in such surveys in return for compensation on a per-task basis and without any formal employment contract. In such cases, the online tool used to collect the data can itself be considered an example of an online gig platform with the whole sample of respondents consisting of online gig workers (see discussion in Piasna and Drahokoupil 2019). This will result in an over-claim of the extent of platform work.

Moreover, online paid surveys may represent certain types of platform work more than others. In particular, they are much closer to the types of platform work that are performed entirely online, involving what is termed microtasking. Workers performing such tasks via platforms are much more likely to come across paid online surveys whereas gig workers, whose services are generally performed offline, or highly-skilled professionals working on bigger projects (for example, cloud-based consultants or freelancers), have very low chances of being recruited to such surveys (see also Vallas and Schor 2020).

The poor reliability of data from online paid panels can be illustrated with the example of the COLLEEM and Huws *et al.* studies. Both these surveys collected data through the Cint network that relies on commercial panels of self-selected respondents who typically receive some type of reward, including cash payments, for completing various online surveys. In Czechia, despite almost identical methodologies involving the use of Cint panels and a coincident timing of data collection, Huws *et al.* found that 28.5 per cent of adults work on platforms on a weekly basis whereas the COLLEEM survey reported that only 5.9 per cent of Czechs have ever tried platform work (Huws *et al.* 2019; Urzí Brancati *et al.* 2020). The large discrepancies in the results between the COLLEEM and Huws *et al.* surveys can be attributed to the methodological problems that come with a reliance on opt-in (self-selected) online samples of inconsistent quality as well as to different approaches to the cleaning and weighting of data.

This does not mean that online surveys cannot provide a good representation of all internet users, or even the whole population, in a given country. For instance, Huws *et al.* (2019: 50–51) compared the responses to their online questionnaire with offline surveys administered in the UK (face-to-face) and in Switzerland (telephone), concluding that there was broad consistency in the results. The use of representative sampling frames, instead of the opt-in and uncontrolled recruitment of participants online, can be a step in the right direction, as can complementing online surveys with telephone or face-to-face interviews among non-internet users or other specific groups who might not be able or willing to read questions on a screen.

Conclusions

The potential for the transformation of labour markets arising from the emergence of online labour platforms has triggered an intense academic, media and policy debate; nevertheless, the true scale of work on online platforms remains in the realm of speculation. Previous studies have used a variety of methods to estimate how many people work in the platform economy, in which countries and occupations the use of platforms is the most widespread and the proportion of the population which is dependent on it for their livelihoods. However, these important questions remain unanswered for the majority of countries or are answered only via ad hoc studies of poor reliability and inconsistent quality. This paper has reviewed some of the recent studies mapping the extent of platform work, ranging from the use of secondary data such as platforms' own databases, financial or tax records, to the collection of primary data through dedicated surveys.

A number of obstacles and limitations still need to be tackled, but previous studies certainly provide us with many important lessons to guide future research. First, experimenting with new methods of data collection, mostly in the US, has provided interesting and largely consistent results (compare Farrell and Greig 2016; Harris and Krueger 2015; Katz and Krueger 2019) and further efforts in this direction should be encouraged also in other countries. Second, independent and ad hoc surveys provide a vast library of questions, with some indication of their reliability, that can be re-used and further tested by other researchers and in other countries. In the sense of informing and guiding policy, such a patchwork of statistics from inconsistent surveys is certainly insufficient. A practical way forward, however, would be the development of a harmonised instrument to be implemented in official, regularly repeated labour force surveys with unmatched sample sizes.

Official labour market statistics have been very slow to devise a measurement of platform work because they have approached it as an entirely new form of work necessitating a replacement of old approaches and tools with new ones invented from scratch. A lack of agreed definitions and clear methodological guidance from international institutions has further hampered these efforts. Thus, a more fruitful avenue for future labour market statistics would be to measure platform work within the broader framework set down by precarious and casual work, where the only difference is technological intermediation (Aleksynska *et al*. 2019; Berg and De Stefano 2017). An organising framework for statistics classified by status at work, put forward during the last International Conference of Labour Statisticians (ILO 2018), can be seen as a step in

this direction (although its proposal for a more refined classification of various forms of non-standard work, compared to the one used internationally since 1993, nevertheless still left platform workers grouped within a broader category of dependent contractors).

Adopting such an approach could also serve to address the broader need for an improved measurement of casual work which captures not only main employment but also the complexity of multiple jobholding, subcontracting, freelance contracting and precarious forms of work such as day labour. This will only grow in importance with the labour market crisis created by the COVID-19 pandemic. In conditions of technologically enabled remote work and a growing demand for services such as food delivery or care, as well as rising unemployment and the financial strain which many workers are experiencing, platform work may resume its rapid growth. Adequate policy responses to this will hinge on a good understanding of these dynamics.

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