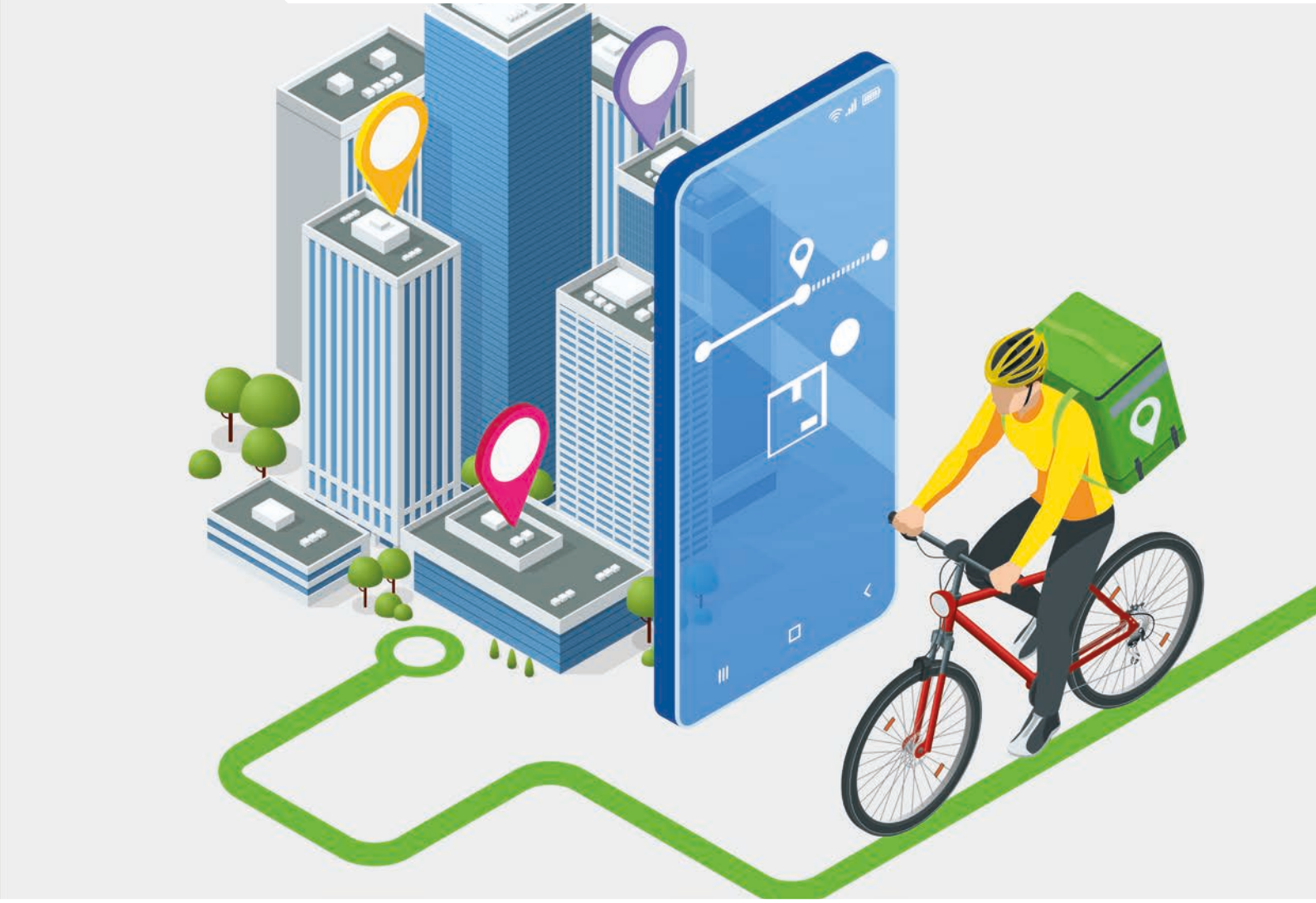
Handbook on Measuring Digital Platform Employment and Work



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Handbook on Measuring Digital Platform Employment and Work

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Foreword

In order to respond to the challenge of measuring digitalisation and its impact, the Organisation for Economic Co-operation and Development, the International Labour Organization and the European Commission launched in 2019 a Joint Expert Group on Measuring Platform Work. The Expert Group gathered a team of statisticians and analysts from the three institutions and from various National Statistical Offices. This report summarises the findings of the Expert Group and provides a set of Guidelines for Measuring Platform Work.

The report was curated by the OECD Centre for Well-being, Inclusion, Sustainability and Equal Opportunities in collaboration with the OECD Statistics and Data Directorate, with significant contributions from the OECD Directorate for Employment, Labour and Social Affairs and the Joint Research Centre of the European Commission (Chapter 2); from the International Labour Organization (Chapter 3); from the OECD Science, Technology and Innovation Directorate (Chapter 4); from Eurostat, the International Labour Organization and the National Statistical Offices of Belgium, Canada, Chile, France, Singapore, Switzerland and the United States (Chapter 5).

Lead authors for each of the chapters were: Marco Mira d'Ercole and Fabrice Murtin (OECD, Chapter 1); Pascal Marianna, Fabrice Murtin and Anna-Rosa Pesole (respectively OECD and JRC, Chapter 2); Michael Frosch (ILO, Chapter 3); Pierre Montagnier and Lucia Russo (OECD, Chapter 4), and Riccardo Gatto (Eurostat, Chapter 5). Written contributions were kindly provided by Pieter Vermeulen (Statistics Belgium), Myriam Hazel and Martin Lemire (Statistics Canada), Carla Cisternas Casale (Chile National Statistics Institute), Guillaume Bichler (INSEE), Boon Heng Ang (Manpower Research and Statistics Department, Singapore), Silvia Perrenoud (Swiss Federal Statistical Office) and Anne Polivka (US Bureau of Labour Statistics). Fabrice Murtin led the project, which was supervised by Marco Mira d'Ercole, under the direction of Romina Boarini. Martine Zaïda has provided essential communications support throughout the project. Cassandra Morley prepared and formatted the manuscript for publication.

The report has benefited from helpful comments provided by national delegates to the OECD Committee on Statistics and Statistical Policy. Their contributions and advice are kindly acknowledged.

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Why measure digital platform employment and work?

Work mediated by online platforms is one of the (growing) types of non-standard work that raises several policy challenges. While digital platform employment and work activities may be attractive to some workers as they constitute additional sources of income and generally display flexible working conditions, they also raise issues in terms of their quality, and of the legal rights and work protections available to workers engaged in them. Major concerns about digital platform employment relate to ensuring job and income security, access to social protection, career development, training, rights to collective bargaining, protection against algorithmic discrimination and opaque management practices, increased risk of job strain including mental health impacts, as well as concerns about tax avoidance, distortions to product market competition, social dumping and "race-to-the-bottom" practices.

Policy makers in many OECD countries have recognised these problems and are taking steps to improve the working conditions of platform workers. Meanwhile, statisticians are grappling with the challenge of adapting their statistical standards and tools to measure the number and characteristics of these jobs. The paucity of information about the prevalence of platform work, and the characteristics of the individuals engaged in it, risks hindering the development of adequate policies. While existing labour force and other household surveys provide valuable information on self-employment, fixed-term and part-time work, they have not succeeded in identifying platform workers appropriately, and other types of statistical sources, such as ad-hoc surveys as well as data directly provided by platforms, can provide much needed information.

What is digital platform employment and work?

In absence of any internationally agreed terminology and standard definition on digital platform work, a key difficulty faced by statisticians has been to properly define the nature and scope of this type of work and employment. An important contribution of this Handbook is to offer a general conceptual framework and a definition of digital platform employment and work that account for the variety of types of digital platforms, with the aim to harmonise statistical practice across OECD countries. Based on the definition of work provided by Resolution I of the 19th International Conference of Labour Statisticians (ICLS), digital platform work is formally defined as:

> *any productive activity performed by persons to produce goods or provide services carried out through or on a digital platform, AND:*
>
> *- the digital platform or a phone app **controls** and/or **organizes** essential aspects of the activities, such as the access to clients, the evaluation of the activities carried out, the tools needed for conducting the work, the facilitation of payments, distribution and prioritization of the work to be conducted; and*
>
> *- the work is for at least one hour in the reference period.*

This definition is broad and includes different forms of digital platform work, including digital platform work for own use, digital platform employment, digital platform unpaid trainee work, digital platform volunteer work and other work activities carried out on or through a digital platform. Moreover, this definition emphasises the notion of control and organisation by the platform, which is essential to disentangle digital platform work and other type of work taking place via a platform. For example, a customer and a service provider exchanging via Teams or Zoom does not constitute digital platform work, as these two communication platforms do not offer integral services like ratings of participants, payments and matching of the two parties. In practice, this Handbook helps identify the key features of digital platform employment and work that statisticians should bear in mind when designing their research objectives and operational protocol.

What data sources are available to measure digital platform employment?

The Handbook reviews the main statistical vehicles used for measuring digital platform employment, and discusses their pros and cons. Labour Force Surveys are best placed to give accurate and robust estimates on the overall prevalence of digital platform employment, although problems of sample size reduce their suitability for gaining insights on the characteristics of digital platform workers. Other sources such as ad-hoc surveys, household surveys covering different issues, administrative datasets or big data, provide a useful complement to LFS. Overall, these various survey vehicles serve different purposes, with each of them having its own strengths and weaknesses. The choice of method depends on the research objectives, the available resources and the trade-offs faced by statistical agencies or researchers.

Measurement recommendations

Finally, the Handbook reviews previous statistical initiatives by National Statistical Offices through the lens of its conceptual framework. Statistical recommendations are derived from this stock-taking exercise. Some general recommendations concern the use of clear definitions for digital platform employment and work during the design of the survey, the practical identification of digital platform workers with the help of filter questions that limit the cognitive burden put on survey respondents, the documentation of the number of jobs and frequency of digital platform employment, and the role of governments in the advancement of this statistical agenda. More specific recommendations concern the design and use of labour force surveys, business surveys, ad-hoc surveys, big data and data from digital platforms.

1 Overview and recommendations

This chapter lays out the background behind the creation of an international Technical Expert Group tasked with preparing the draft *Handbook on Measuring Digital Platform Employment and Work*. It then describes the content of the Handbook and summarises its key findings and statistical recommendations. Recommendations are either general and applicable to any statistical vehicle, or targeted at specific surveys.

Context

Work mediated by online platforms is one of the most debated types of non-standard work. While platform employment and work activities provide workers with options for matching work with their skills and life circumstances, they also raise issues in terms of their quality, and of the legal rights and work protections available to workers engaged in them. Statisticians in all OECD countries are grappling with the challenge of adapting their statistical standards and tools to measure the number and characteristics of these jobs.

Several international organisations have addressed this issue in the context of ongoing work on the 'future of work', digitalisation and job quality. At the OECD, the Committee on Statistics and Statistical Policy discussed in 2018 how National Statistical Offices are addressing a growing policy demand for better statistics in this field, the need for new statistical definitions, the risk that labour force surveys may undercount the number of people involved in these jobs, and the need to leverage additional sources of information.[1] Furthermore, in the context of the OECD Future of Work Initiative, the OECD Directorates on Employment, Labour and Social Affairs and on Science, Technology and Innovation assessed measurement options and provided first recommendations on these issues.[2]

At the European Commission, Eurostat established in 2019 a LAMAS Task Force on measuring digital platform employment (TF DPE), which provided an opportunity for collaboration in a field that is of great interest to both European and non-European countries. Eurostat's Task Force has developed a pilot survey that was implemented in the EU Labour Force Survey in 2022, with the long-term goal to regularly produce data on digital platform employment and work – which will finally depend on the results of the pilot survey. Partial results have been presented at the last LAMAS meeting in December 2022, but at this stage Eurostat is still expecting from countries the entire dataset by the end of March 2023. Based on the final results, Eurostat will decide on the most adequate follow-up. In particular, Eurostat may organise a Conference on the topic that will address the policy demands at EU and national levels, from both other stakeholders and international organisations, for reliable statistical information on the digital platform economy, with a focus on the labour market and on how the statistical community could answer these demands. In addition, the Joint Research Centre of the European Commission (JRC) has implemented several waves of the COLLEEM survey, an instrument designed to better understand the working conditions of platform workers. JRC has published a methodological paper on the measurement of platform work[3] as well as the results from the second wave of the survey.[4] Last but not least, on the policy front, the European Commission released a Directive on "Improving the working conditions of people working through digital labour platforms" in December 2021, which emphasised the issues of the employment status, algorithmic management, enforcement, transparency and traceability.

Measuring work mediated by online platforms is also of great importance in the context of the Resolution concerning statistics on work relationships adopted by the 20th International Conference of Labour Statisticians (ICLS) in October 2018. The resolution includes a new International Classification of Status in Employment (ICSE-18). The ILO serves as secretariat of the ICLS and is engaged in the follow-up and promotion of implementation of the new international statistical standards. This Resolution provides a new classification of status in employment that includes the new category of "dependent contractors", and a broader classification of status at work. [5]The Resolution included a commitment to undertake further development work on the measurement of workers whose employment is intermediated through Internet-based platforms or apps. The ILO undertook a stock-taking of recent work on Digital labour platforms and the future of work in a report published in 2018, and explored the impact of digital labour platforms on enterprises, workers and society in the World Employment and Social Outlook 2021: The role of digital labour platforms in transforming the world of work. The ILO, in collaboration with other partners, is currently preparing a report to be discussed at the upcoming 21st International Conference of Labour Statisticians (ICLS) in 2023. The report will: a) discuss, based on the work done so far by countries and agencies, both the conceptual and operational issues related to measurement of the topic; b) identify key issues requiring further work; and c) propose approaches to further develop statistics in this field.

In this context, the OECD, ILO and the European Commission (represented by EUROSTAT, DG EMPL JRC, and EUROFOUND) agreed to strengthen their collaboration in the field of measuring platform work and employment through the creation of a Technical Expert Group (TEG). The goal of the group, gathering a number of statisticians and analysts, was to prepare a set of recommendations for measuring platform employment and work, in view of producing a Handbook. A similar set-up has been used by the OECD for developing measurement recommendations in 'new' fields that currently lack a solid foundation within the statistical system.[6] In particular, the recommendations of this *Handbook* are broadly aligned with those from the *Handbook on Forms of Employment* (UNECE, 2022) when it comes to measuring platform employment and work, and several members of the TEG also contributed to the UNECE Handbook. In the future, the work of the TEG will feed into the work envisaged by the EU LAMAS Task Force and by other (non-European) NSOs participating in the Technical Expert Group.[7]

Finally, the *Handbook on Measuring Digital Platform Employment and Work* was presented to the Committee on Statistics and Statistical Policy (CSSP), which provided feedback at the 22-23 June 2022 meetings in Geneva. Final comments from CSSP, ILO, the EU and several National Statistical Offices were inserted afterwards.

Key insights from the Handbook

The Handbook is structured into four chapters. Chapter 2 lists the key policy issues raised by digital platform employment and work that require more reliable data on the prevalence, characteristics and working conditions of digital platform workers. Chapter 3 identifies the specific features that define digital platform employment and work among the constellation of platform activities, in view of harmonising statistical practices across surveys and countries. Chapter 4 reviews country experiences in measuring, highlighting best practices and drawing lessons from less successful attempts. Chapter 5 seeks to operationalise the lessons learned from past practices and provides statistical recommendations.

Chapter 2: Why measure digital platform employment and work?

This Chapter provides the policy motivations for building statistical guidelines on digital platform employment and work. First, it highlights the growing international demand coming from a range of different policy perspectives to measure platform employment and work, the number of workers involved, their individual and job characteristics, and their working conditions. Second, it makes the case that correctly classifying platform workers within the framework of existing labour laws requires statistical standards that can improve the enforcement of different laws and regulations impacting on digital platform work (labour law, social security and taxation). Third, it argues that the lack of data affects the quality of existing and forthcoming policies in the areas of labour market regulations, social protection and social dialogue.

Overall, Chapter 2 concludes that the paucity of information about the prevalence of platform work and the characteristics of the individuals engaged in it, risks hindering the development of adequate policies. While existing labour force surveys and household surveys provide valuable information on self-employment, fixed-term and part-time work, they have not succeeded in identifying platform workers appropriately. While other types of statistical sources (such as the COLLEEM survey) as well as data directly provided by platforms (e.g. transaction records such as those submitted by digital platforms to tax authorities) can provide much needed information, official statistics have a very important role to play in providing the evidence needed to address the broad range of policy questions described above. At the same time, policy action can improve availability of data on platform work, for example by encouraging data sharing by platform companies.

Chapter 3: Conceptual framework, concepts and definitions

Chapter 3 proposes a conceptual framework that helps understanding the nature of digital platform employment and work,[8] while embracing the diversity of the online activities and of the platforms' attributes. The key objective of this framework is to provide a general and internationally agreed terminology as well as standard definitions of digital platform work and related concepts. The Chapter describes the statistical framework of the digital economy from an economic viewpoint and provides a definition of *digital platforms* that is most appropriate for identifying digital platform work, as well as a general definition of digital platform work.

Based on the definition of work provided by Resolution I of the 19th International Conference of Labour Statisticians (ICLS), digital platform work is defined as:

> *any productive activity performed by persons to produce goods or provide services carried out through or on a digital platform, AND:*
>
> *- the digital platform or a phone app **controls** and/or **organizes** essential aspects of the activities, such as the access to clients, the evaluation of the activities carried out, the tools needed for conducting the work, the facilitation of payments, distribution and prioritization of the work to be conducted; and*
>
> *- the work is for at least one hour in the reference period.*

First, this definition is broad and includes different forms of digital platform work. Building on the 19th ICSL Resolution, these include: i) *digital platform work for own-use;* ii) *digital platform employment;* iii) *digital platform unpaid trainee work;* iv) *digital platform volunteer work;* and v) *other work activities carried out on or through a digital platform*. As such, the definition recognises that digital platform employment is only one out of many forms of work that can take place on or through a digital platform.

Second, this definition emphasises the notion of control and organisation by the platform, which is essential to disentangle digital platform work and non-DPE work taking place via a platform. For example, a customer and a service provider exchanging via Teams or Zoom does not constitute digital platform work, as these two communication platforms do not offer integral services like ratings of participants, payments and matching of the two parties. Conversely, the classification as digital platform work is straightforward with platforms offering ratings of participants, payment services and algorithmic matching, such as Uber or Upwork. In between those two examples, classification can be difficult when a platform displays some but not all of the usual attributes of a digital platform. For instance, the French platform Doctolib allows patients to make appointments with doctors (hence completes a matching based on location and availability), or to organise a video consultation for which an online payment can be made; on the other hand, this platform does not rate doctors or patients, nor does it realise payments for physical consultations. In the case of Doctolib and other ambiguous situations, the classification as DPE work depends on the objectives of the statistical analysis and on the exact specification of its scope.

Finally, Chapter 3 focuses on digital platform employment and outlines a flexible framework that lays the foundation of a comprehensive measurement of digital platform employment, and that provides the possibility to focus on one or more specific parts. This framework enables a decomposition of the broad concept of DPE along the dimensions of: i) the type of production carried out (goods or services); ii) the type of digital platforms; iii) and the type of status in employment category. This will allow countries to focus on the part of DPE that is of high policy concern while at the same time strengthening the transparency and harmonisation between countries and agencies working in this area.

Chapter 4: Critical review of existing statistical sources on digital platform employment

Chapter 4 aims to: i) review the main measurement initiatives on digital platform employment; ii) identify the lessons learnt from these initiatives; iii) understand the pros and cons of the various related statistical

vehicles for answering different policy issues. The most important lessons learned from this chapter are listed below.

First, Labour Force Surveys (LFS) are best placed to give accurate and robust estimates on the overall prevalence of digital platform employment, although problems of sample size reduce their suitability for gaining insights on the characteristics of digital platform workers. Even though the sample sizes of LFS are typically large, they will nevertheless lack statistical precision when measuring the characteristics of potentially small groups in the population such as digital platform workers. This is all the more true for Information and Communication Technologies (ICT) Usage Surveys, which have a smaller sample size than LFS. Also, the nature of digital platform employment (task approach), as measured by ICT Usage Surveys, is not always compatible with the concepts underlying LFS.

Other sources (such as ad-hoc surveys, household surveys covering different issues, administrative datasets or big data) provide a useful complement to LFS. For example, Time Use Surveys (TUS) have the advantage of capturing platform work done for short periods and as a secondary activity, but to date they have not included questions to investigate this topic; they also have the disadvantage of being conducted very unfrequently. Tax registers, or in general other administrative registers, can provide information from both the platforms (when it is possible to identify them as tax payers) and from the workers (when it is possible to identify them as DPE workers). Information on income is the main item that is best covered by this source. However, coverage of tax registers is limited to formal enterprises and workers covered by a regular work contract, which is an important limitation in countries where informality is common. Moreover, when low paid workers are exempted from tax declaration and/or payment, they are also excluded from the reference population of tax registers.[9] More generally, the reference population of tax registers and other administrative data is affected by national legislation that usually has no statistical purpose, limiting the representativeness of the source and the cross-national comparability of measures based on them. At present, the possibilities of using administrative data are limited, although these may increase as tax authorities develop data-sharing agreements with digital platforms.

Finally, the use of online surveys can reduce costs (though possibly at the expense of reduced accuracy and higher sampling and selection bias), allowing researchers to reach out to a larger number of respondents. Such online surveys, typically undertaken by agencies that are not part of countries' official statistical systems, can complement official surveys, which can be used to test the overall accuracy of other approaches and to calibrate their results. Overall, these various survey vehicles serve different purposes, with each of them having its own strengths and weaknesses. The choice of method depends on the research objectives, the resources available, and the trade-offs faced by statistical agencies or researchers.

Chapter 5: Measurement recommendations

Chapter 5 describes in more details some important initiatives undertaken by different institutions that have set up various surveys on digital platform employment (DPE). The Chapter takes stock of these experiences to provide statistical recommendations. Relative to Chapter 4, it is more focused on questionnaire design and adopts an operational perspective. Different members of the Technical Expert Group have contributed to this chapter, bringing their experience on generating information on DPE from different sources. In order to harmonise their contribution, and to facilitate comparisons, a common template was provided to authors, and is used in the chapter to report on these initiatives.[10] Statistical recommendations, both general and pertaining to each statistical vehicle, are provided below.

General recommendations

- *Definitions of Digital Platform Employment and Work*. Measuring the same concept of digital platform employment and work across national and international surveys is key for comparisons across countries and measurement tools. The definition provided in Chapter 3 provides the

benchmark for the broad concept of "digital platform work" as well as its different conceptual components. With this as a starting point, producers of data will be able to create a greater degree of transparency and understanding of what is respectively included and excluded in a given measurement initiative, as described in Chapter 5. This will contribute to a more harmonised measurement and a better understanding among users.

- *Identification of Digital Platform Workers through surveys*. Rather than relying on a single overarching question, short questions should be asked concerning different elements of digital platform employment and work, with the interviewer or subsequent analysis then determining whether respondents should be considered as belonging to this category or not.
- *Use of filter questions*. Filter questions should be used to determine the nature of the tasks conducted, such as whether the service was provided online or delivered in person. These filter questions should clearly identify which tasks respondents are referring to when answering subsequent questions about the nature of the work or tasks performed.
- *Cognitive burden.* For surveys, it is key to ensure that respondents understand the meaning of digital platform employment and work. To generate consistent statistics over time, survey respondents should have a similar understanding of questions in each period, and should not be confronted with overly long introductory text, which is likely to be ignored by respondents.
- *Number of jobs and frequency of DPE.* For each data source ideally, it would be important to document the number of jobs exercised by persons carrying out digital platform employment and/or the frequency of DPE activities over the LFS reference period, and possibly over longer reference periods given the episodic nature of DPE for many workers.
- *Future steps and the role of governments*. This Handbook is an important first step into a statistical field that will expand in the future. Its framework, definitions and recommendations will be improved as new evidence flows in. Given the fast evolution of DPE, the authors recommend to evaluate this Handbook in a couple of years, rather than in a decade. Moreover, governments can play a role for improving high-quality statistical information. For example, tax legislation providing special regimes to DPE incomes helps identify the reference population, and some countries have introduced obligations for big data producers or for labour digital platforms to provide their data to statistical authorities. Tapping from administrative surveys will be important future development. Conversely, measures of digital platform employment should be independent of legislative changes that classify digital platform workers. Failing to ensure the independence between legislation and statistics would impact on both cross-sectional and time series estimates of DPE.

Recommendations specific to different tools

Labour Force Surveys

The statistical experiences based on LFSs highlight a range of differences in terms of whether questions on DPE are asked to all respondents or to a subset thereof (e.g. those classified as "employed", or own-account workers or dependent contractors[11]); whether they include or exclude activities related to renting out capital goods (where labour services only have an auxiliary function); whether different typologies of digital platform employment should be distinguished (e.g. distinguishing between tasks done on location, delivered in person, and those done entirely online); what reference period should be considered in order to classify workers as performing a digital platform activity (e.g. one week or one year or at least one week in a particular year); whether digital platforms should be limited to those that, in addition to matching workers and clients, also manage the payment between the two; whether specific digital platforms should be mentioned to guide respondents; and more. No single answer to all these questions exists, and the best approach will partly depend on the number of questions that can be asked (i.e. few, in the case of questions included in the general or core questionnaire of LFS; potentially more, in the case of ad-hoc or recurrent LFSs modules). A number of LFS-specific recommendations are made in the chapter:

- The LFS should be the tool of choice when it comes to measuring the number of people involved in digital platform employment. Other measurement tool should, to the extent possible, align their definition of digital platform employment to the one used by LFS. The starting point is the LFS definition of employment, and the DPE should be a subset of it.
- People's activities on digital platforms can take various forms: i) unpaid work; ii) employment mostly involving a return on labour; iii) activities mostly involving a return on capital but still considered as employment (e.g. renting capital goods); iv) other activities involving a return on capital but no employment (e.g. using an app to trade stocks). While some NSOs may narrow their questions to DPE, those opting for a broader remit should do so in ways that allow to clearly distinguishing between the various activities.
- In addition to basic breakdowns of DPE by demographic characteristics and employment status included in LFS, LFS should ask respondents on the "regular" or "occasional" nature of their DPE relation, based on either the number of hours worked or the earnings gained, and whether tasks are delivered online or in-person.
- While some NSOs may use a longer (12-month) reference period to identify workers who engage with digital platforms only occasionally, it is recommended to also include questions about digital employment in the survey reference week within the LFS questionnaire, so as to allow measuring the incidence of DPE among all employed people by LFS.
- Digital platforms should be assessed on both criteria of intermediating between clients and service providers with some degree of control over the work, and managing the payment for the services provided. Surveys should implement these two criteria in ways that allow narrowing the focus on the overlapping area. In particular, platform practices may differ as online services tend to be paid online through the platform, while on-location services have a higher probability to be paid in person.
- Naming of (well-known) digital platforms should be avoided when first asking questions on DPE, to avoid the respondent focusing on the provided names only, but could be used in follow-up questions for checking and validating respondent's answers.
- The status in employment should be always investigated, as the new ICSE-18 classification provides for additional categories between employee and own-account worker that well describe the situation of workers remunerated by executed tasks but organised as a dependent working relationship. It is worth stressing that national legislations also affect workers' status in employment: these differ a lot across countries, and workers performing the same tasks can be classified as dependent employment or own-account work in different countries.

Business surveys

Business surveys can provide information on both demand and supply side of the employment relation. They may cover the platform themselves (although in this case it will be difficult to reach all the platforms operating in a country, especially those based abroad) or the enterprises acting as clients in the market (while excluding non-business clients). Particularly important is to clearly identify the reference population of the survey, which may not always cover the entire enterprise population, and ensure that samples are representative. To the extent possible, business surveys should:

- Cover the universe of business units operating in a country, focusing on business' demands for services provided by digital platforms.
- Rely on a definition of digital platform that is closely aligned to that used by LFS, i.e. platforms that mediate between clients and providers in a broad sense, also including those who intermediate the payment for the labour services provided.
- Provide information on the quantitative importance of digital platforms for business turnover, as well as questions on businesses' satisfaction with their relationship to digital platforms.

- Include common breakdowns of businesses (e.g. by size of their payroll, industry, annual turnover, ownership type) allowing to compare businesses' reliance on digital platforms across different parts of the business community.
- Finally, the International Standard Industrial Classification (ISIC) needs to be updated to add industry codes that can specifically capture platform companies.

Ad-hoc surveys

When the required information focuses on particular qualitative features of the work, such as working conditions or workers satisfaction, an *ad-hoc* survey is the best choice. They can be specifically designed to focus on small or very small phenomena, ensuring a representative sample. While they require a significant planning effort and dedicated resources, they provide information that is not feasible to collect with other sources, information which is often necessary to calibrate labour market policies focusing on relevant but small (or not yet big) phenomena. While raising some selection, sampling and measurement issues, ad-hoc surveys such as COLLEEM have the advantage of typically covering a broad range of countries, hence providing comparable evidence on different aspects of DPE.

- *Ad-hoc* surveys on digital platform employment and work such as COLLEEM should be routinely implemented across countries, covering both quantitative and qualitative aspects of workers' experiences with digital platforms.
- Consideration should be given to including a small set of comparable questions on digital platform employment in non-official surveys on working conditions (e.g. EWCS, ISSP, etc.), while aligning concepts and definitions to those used in LFS.

Big data

Big data sources are in an early phase of investigation. They are promising but it is clear that they can just complement other sources. By their nature it is difficult to plan in advance their information coverage, this is more an output of the study than an input, since the information extraction and its own definition proceed in parallel. Moreover private ownership of the data makes them expensive and unreliable for official statistics. Also continuity in time of the availability of this kind of data cannot be ensured. This makes this source more feasible, at the moment, for one-shot investigations of one particular aspect of digital platform employment, always in conjunction with traditional sources.

- Data sharing agreements and reporting obligations for big data producers and labour digital platforms would enhance the quality of statistical information

Data from digital platforms

Data compiled by platforms themselves or 'platforms of platforms' can be used as stand-alone sources or, preferably, to complement results from surveys and administrative records. While the availability of timely and granular data from digital platforms provide some advantages for data analysis and policy developments on the future of work in a foreseeable context of growing incidence of platform employment, there are several issues related to the nature of data compiled by platforms on gig jobs and gig workers, on digital platform employment and work and their representativeness, potential bias in the sample or data provided that need to be carefully assessed.

- Facilitating data sharing agreements with digital platforms providing labour services is one way for deepening data analysis of digital platform employment.
- Compelling digital platforms to share data with public authorities as envisaged by the European Commission's proposed Directive on "improving working conditions in platform work" may significantly increase transparency and traceability of platform work and enhance enforcement.

Notes

[1] The discussion was based on a paper on Measuring Platform and Other New Forms of Work [SDD/CSSP(2018)10] prepared by the OECD Directorate on Employment labour and Social Affairs.

[2] OECD (2019), "Measuring platform mediated workers", OECD Digital Economy Papers, No. 282, OECD Publishing, Paris, https://doi.org/10.1787/170a14d9-en. These recommendations are reflected in Chapter 3 of the Handbook.

[3] Pesole, A., Fernández-Macías, E., Urzí Brancati, C., Gómez Herrera, E. (2019), "How to quantify what is not seen? Two proposals for measuring platform work, European Commission", Seville, JRC117168. https://ec.europa.eu/jrc/sites/jrcsh/files/jrc117168.pdf

[4] Urzí Brancati, C., Pesole, A., Fernández-Macías, E (2019). *New evidence on platform workers in Europe. Results from the second COLLEEM survey*, EUR 29958, , ISBN 978-92-76-12949-3, doi:10.2760/459278, JRC118570.

[5] "Dependent contractors" share some of the features of "dependent workers", when assessed from the perspective of the locus of authority in the employment relation, and of "workers in employment from profit", when assessed from the perspective of economic risks. (https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/meetingdocument/wcms_648693.pdf).

[6] This includes the Guidelines of Measuring the Quality of the Working Environment, developped as part of the CSSP programme of work for 2016-17 and released by the OECD in November 2017.

[7] The EU-ILO-OECD Technical Expert Group (TEG) convened several meetings with participants from international organisations (ILO, EUROSTAT, JRC, EUROFOUND, OECD) and national statistical offices over the past three years. The first meeting was held physically in Paris on 12-13 September 2019, and was followed by several other virtual meetings to discuss drafts of the various chapters. Each Chapter of the Handbook was under the responsibility of a leading author and received comments and contributions from other authors. The list of contributors and the composition of the Technical Expert Group is included in the acknowledgement page of the draft Handbook. At the OECD, the work of the TEG is supported by staff from the Centre on Well-being, Inclusion, Sustainability and Equal Opportunities; the Directorate on Employment, Labour and Social Affairs; and the Directorate on Science, Technology and Innovation.

[8] The 19th ICLS Resolution, drawing on the recommendation of the SSF Commission, introduced in 2013 a distinction between different "forms of work". In this classification, "work" comprises any activity performed by persons to produce goods or to provide services for use by others or for own use. Within this broad category, the Resolution distinguished between: a) "own-use production work" (comprising production of goods and services for own final use); b) "employment work" (comprising work performed for others in exchange for pay or profit); c) "unpaid trainee work" (comprising work performed for others without pay to acquire workplace experience or skills); d) "volunteer work" comprising non-compulsory work performed for others without pay; and e) "other work activities" (including activities such as unpaid community service, unpaid work by prisoners, and unpaid military or alternative civilian service).

[9] As an alternative or complement to the use of tax registers as a source of information on the income of digital platform workers, such information could be gathered by including specific questions in official household income surveys.

[10] TEG members that contributed to these descriptions of measurement initiatives, were asked to describe the: i) *original purpose* of the initiative (quantitative or qualitative analysis, information needs), identifying the question the exercise aimed to answer (e.g. 'how many persons are involved in digital platform employment'? 'What are their characteristics and working conditions'?); ii) *reference population and sampling***;** iii) *other relevant survey features* such as reference periods, data collection mode and methodological choices; iv) *implied operational definition* of DPE**,** covering the general and operational (often only implicit) definitions of the concepts analysed as well as their practical implications (e.g. which platforms are excluded? does the operational definition include goods and/or services? is it restricted to a specific employment status, for example own-account workers only or including employees or excluding volunteers?); and v) *Goals and lessons learned***,** including a list of 'do' and 'do not' for the future.

[11] Depending on the implementation in survey instruments of the ICSE-18 resolution adopted by the 20th International Conference of Labour Statisticians (ICLS) concerning statistics on work relationships, revising the International Classification of Status in Employment adopted in 1993 (ICSE-93).

2 Why measure digital platform employment and work?

This chapter provides policy motivation for producing statistical guidelines on the measurement of platform employment and work. It first highlights the growing international demand coming from a range of different policy perspectives to measure digital platform employment, the number of workers involved, their individual and job characteristics, and their working conditions. The chapter also points at the need to improve the classification of platform workers, and therefore the enforcement of law (e.g. labour law, social security and taxation) with regard to digital platform workers. Finally, the chapter highlights some major data gaps that will need to be filled in the future.

Introduction

The development of digital technologies and of new business models have contributed to the rise of online platforms and the emergence of different types of platform-mediated work, such as "crowd work", "gig work", and other forms of on-demand labour. Most of such work is performed by independent self-employed or own-account workers, in many cases only as a part-time job (e.g. on-call work).[1]

One positive aspect of digital platform employment is the increased efficiency of the matching process in the labour market, which may help to reduce frictional unemployment and skills mismatches. Another advantage, often cited by workers, is greater flexibility to choose when and where to work.

However, workers engaged in this type of work also report facing stressful situations more frequently than other workers, to perform more routine tasks and to have fewer learning opportunities (Pesole, 2018[1]). Broader concerns about digital platform employment relate to ensuring job and income security, access to social protection, career development, training, rights to collective bargaining and protection against algorithmic discrimination and opaque management practices. Some platform workers may face an increased risk of work accidents or job strain, including mental health problems. Platform employment and work also raise concerns for tax avoidance, distortions to product market competition, social dumping and race-to-the-bottom practices. Policy makers in many OECD countries have recognised these problems, and emphasised their determination to take steps to improve the working conditions of platform workers (von Der Layen, 2019, p. 10[2]).

This chapter provides the motivation for the statistical guidelines proposed in this volume:

- First, it highlights the growing international demand coming from a range of different policy perspectives to measure digital platform employment, the number of workers involved, their individual and job characteristics, and their working conditions.
- Second, it argues that better statistical guidelines would help improve the classification of platform workers, and therefore the enforcement of law (e.g. labour law, social security and taxation) with regard to digital platform workers. In some cases, new platform business models have spurred the growth of false or bogus self-employment, with implications for their employment conditions and protections. This misclassification needs to be addressed by correctly classifying platform workers within the framework of existing labour law.
- Third, it examines how a lack of data also threatens to affect the development and implementation of existing and forthcoming policies in the areas of labour market regulations, social protection and social dialogue.

This chapter reviews existing evidence on digital platform workers by taking stock of a dedicated ad-hoc survey, namely COLLEEM, and explains the issue of digital platform workers classification. It then lists some key policy issues that are brought to the fore by the diffusion of platform work, and which call for better data by statistical offices and other data producers. Finally, it highlights major data gaps that will need to be filled in the future.

Digital platform employment: Evidence from the COLLEEM survey

The size of the platform economy according to COLLEEM

One of the major challenges of the platform economy is to gauge the size and characteristics of platform work. Definitions and measurement approaches directly affect the range of available estimates. Indeed, the size of platform work depends on the conceptual definition of what constitutes platform work and a digital labour platform, on the methodological approach used to collect the data, and the reference period used. Statistical offices around the world have launched initiatives to capture this new phenomenon,

mobilising a range of sources (labour force surveys and special modules thereof, surveys about IT use by individuals, etc.). Unfortunately, lack of common definitions and classifications has led to a range of estimates that differ in terms of both the prevalence and intensity of the phenomenon, its pace of diffusion in different countries, the characteristics and working conditions of the workers involved.

This section presents findings from the JRC COLLEEM surveys, conducted over the years 2017 and 2018 among frequent internet users aged between 16 and 74 years old, which has the advantage of covering a broad range of European countries based on a common methodology. The JRC COLLEEM survey is an online panel survey covering 15 EU Member States[2] plus United Kingdom, that gathered a total of 38,878 responses. A limitation of COLLEEM is that respondents were drawn from commercial online panels, and that participants to this survey might be more engaged in online work than the general population. Similarly, this survey may be less effective in detecting platform workers who supply labour on-location (Urzi Brancati, Pesole and Fernandez Macias, 2020[3]). Despite these limitations, COLLEEM is currently the most important source of information available providing comparative data on platform work in Europe.

The filtering question to identify platform workers in the COLLEEM survey follows the so-called “income approach” (see Chapter 3). That is, it asks respondents whether they have *ever* gained income from different online sources, excluding any labour supplied via capital platforms (e.g. AirBnb) or any additional income deriving from e-commerce, crowdfunding and similar activities.

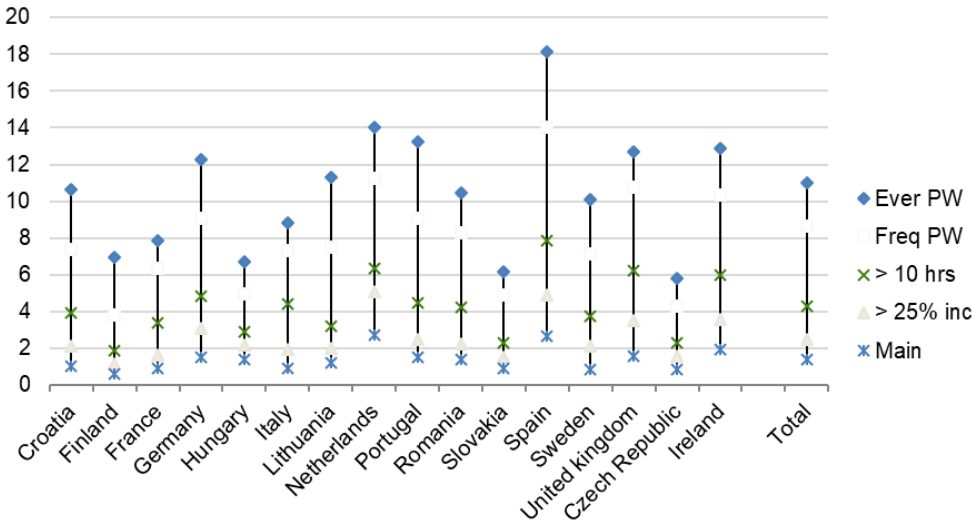
The prevalence of platform work for those who *ever* provided labour via platform is around 11% of the working age population for the 16 countries covered, ranging from a maximum of 18% in Spain and to a minimum of about 6% in the Czech Republic.

The broadest definition of ‘*ever platform workers*’ tells us about the extension of the phenomenon in each country. However, it brings little information on how many people routinely spend a significant amount of time providing services via platforms or make a living out of platform work. In order to get a measure of the prevalence of platform work that can be broadly compared to standard measure of paid work or employment, additional elements need to be taken into account: i) the amount of time spent on platforms; ii) the frequency of provision of labour services; and iii) the income gained. Figure 2.1 shows how the initial estimate for ‘ever platform workers’ change when frequency (i.e. labour services are provided via platform at least monthly), regularity (i.e. number of hours worked) and income earned (i.e. more than a quarter of the income of respondents) are taken into account.

About 11% of the working population in the 16 European countries covered by COLLEEM has provided labour services through platforms at least once; these are the ones defined as *ever platform workers* (Ever PW). When regularity of labour services provision is considered, the share for platform workers who have provided labour services at least monthly (Freq PW) is 8.6% of the working-age population. To identify employed person, the Labour Force Survey (LFS) asks respondents whether they worked for pay or profit at least one hour during the survey reference week. [3] In the context of COLLEEM, platform workers who worked at least 10 hours in the last month (>10hrs) are considered as potentially satisfying the LFS “one-hour criterion”, and hence could be considered as ‘employed’ in the LFS sense. In other words, 4% of the working-age population in the 16 European countries would be employed via platforms, and 2.5% of the working-age population made at least 25% of their income through digital platforms.

Figure 2.1. Estimates of platform work in 16 European countries

Percentage of the working-age population, by frequency and income earned



Source: 2018 JRC COLLEEM survey; Urzi Brancati, Pesole and Fernandez Macias, (2020[3]), JRC Publications Repository - New evidence on platform workers in Europe, https://publications.jrc.ec.europa.eu/repository/handle/JRC118570.

However, to better align the COLLEEM category of platform workers to the LFS one of people employed in main job, the criteria of a sufficient number of hours and income earned can be considered. *Main platform workers* can be defined as those who provide labour services via platforms at least monthly, who work on platforms at least 20 hours a week or get at least 50% of their income via platforms. These workers account for 1.4% of the working population in the 16 European considered.

Some characteristics of digital platform workers

The COLLEEM survey is perhaps not the best instrument to gauge the size of the platform economy, a question for which a Labour Force Survey (LFS) would constitute the main statistical vehicle as its sampling is more representative and accurate. However, the COLLEEM survey is very useful to describe the characteristics of digital platform workers and their tasks, which are not accessible via a LFS due to space constraints. Box 2.1 summarises the key findings.

Box 2.1. Key facts from COLLEEM

- 41.4% of those identified as platform workers in 2017 remained in this category in 2018.
- About 4 in 10 digital platform workers are women.
- Digital platform workers are generally young; the average platform worker in the 16 European countries covered by COLLEEM is 34 years old.
- A much higher proportion of foreign-born workers provide labour services via digital platforms as compared to native workers, and they are mostly concentrated in software development and in transport and delivery.
- About 50% of digital platform workers possess at a least a higher secondary education, and about 40% have a bachelor's degree or higher.

- Digital platform workers providing professional services tend to use more than one platform. while digital platform workers providing on-location and transport and delivery services are more engaged and locked-in with one platform.
- About 69% of respondents report to get paid based on the task performed, which implies that many of them must undertake a substantial share of unpaid work in order to get paid work.
- Half of all platform workers find their work stressful, monotonous and unhealthy.

The dynamics of platform work

The second wave of COLLEEM, run in 2018, also included a longitudinal component. 3,323 respondent who were identified as platform workers in the first wave were re-interviewed in 2018. By focusing on this sub-sample, (Urzi Brancati, Pesole and Fernandez Macias, 2020[3]) find that 41.4% of those identified as platform workers in 2017 remained in this category in 2018, as opposed to 58.6% who dropped out of it. Platforms mediating transportation services have a higher turnover rate than those who mediate professional online services or mediate microwork.

Age distribution of platform workers

Platform workers are generally young. The average platform worker in the 16 European countries covered by COLLEEM is 34 years old. Software developers tend to be younger (32.5), and women providing such services are the youngest (30.8) among all platform workers. The average age of platform workers who provide services on location is 33, and about 34 for freelancers and micro-taskers. Women in all tasks are slightly younger compared to men in the same task.

Gender distribution of platform workers

About 4 in 10 platform workers are women. The gender gap is smaller when work-intensity in the platform is lower. *Marginal platform workers* are 55% men and 45% women; the gap increases with the intensity of the work provision, up to almost 70% men and 30% women for *main platform workers*. Similarly, women tend to be more represented in specific tasks, in particular, freelance (43%) and micro-task (41%), while the share of women in software development is the lowest (24%) followed by transport and delivery (37%).

Share of migrants among platform workers

In 2018, COLLEEM also collected data on platform workers by country of birth. A much higher proportion of foreign-born workers provide labour services via digital platforms as compared to native workers. However, this pattern does not have a unique interpretation. On one hand, the large presence of foreign-born platform workers may suggest that work on digital labour platforms is not particularly attractive, since several studies have demonstrated how foreign-born workers tend to be employed in lower quality jobs while being overqualified (OECD, 2018[4]). On the other hand, the results may be an indication of the labour market opportunities that platforms provide to this population.

As shown on Figure 2.2, foreign-born workers are mostly concentrated in software development, a medium-high skilled task where the presence of migrants may suggest some outsourcing from companies to platforms to reduce labour costs, and similarly for firms in transport and delivery.

Figure 2.2. Share of foreign-born among platform workers by nature of tasks performed

Average among 16 European countries

Source: 2018 JRC COLLEEM survey (Urzi Brancati, Pesole and Fernandez Macias, 2020[3]), JRC Publications Repository - New evidence on platform workers in Europe, https://publications.jrc.ec.europa.eu/repository/handle/JRC118570.

Education of platform workers

About 50% of platform workers possess at a least a higher secondary education, and about 40% have a bachelor's degree or higher. This share is below 30% for foreign-born platform workers. The general level of education increases with the intensity of the work provision on platforms, while the differences across types of tasks are less remarkable. In general, freelance and software development present slightly higher shares of high-educated platform workers.

Work organisation in platforms

Platforms disrupt the traditional organisation of work by disaggregating jobs into the accomplishment of single tasks, and by introducing new managerial practices that facilitate the coordination of a multitude of workers to a multitude of tasks of different nature in a global market at almost real-time. As a result, platform workers often provide multiple type of services using different platforms. According to COLLEEM data, roughly 60% of frequent platform workers have provided more than one type of task. When a platform worker says that he or she has done more than one type of task, it means that they did for instance a micro-task and a delivery. The percentage of platform workers providing more than one type of task increases with the intensity of work via platform.

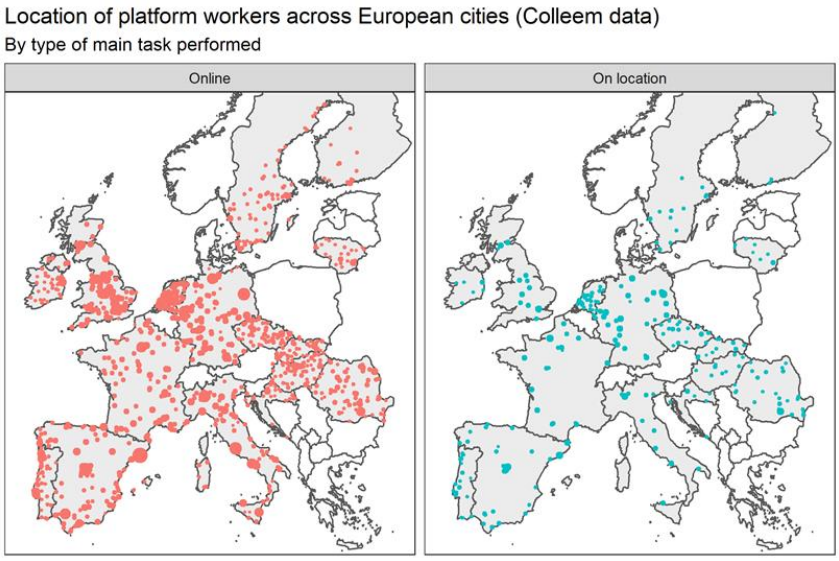
Location of platform workers

Place of living may also affect the type of services supplied by platform workers. Indeed, some services may not be available in areas that are more rural. Figure 2.3 shows a higher concentration of platform workers in big cities and metropolitan areas; this effect is stronger for on-location services, as online services can in theory be supplied from everywhere with adequate broadband coverage.

Another interesting information collected in COLLEEM is to which extent platform workers offer their services through more than one platform ('multi-homing'). According to COLLEEM data, 40% of platforms workers[4] use more than one platform, 52% use only one platform and the remaining 8% prefer not to answer. When looking at a breakdown by occupation, platform workers providing professional services tend to use more than one platform. This is the case particularly for translation services, as 40% declare to use more than one platform, and for interactive services (47%). By contrast, platform workers providing

on-location and transport and delivery services are more engaged and locked-in with one platform, as only 31% and 36% respectively provide services in more than one platform.

Figure 2.3. Online and on-location platform workers across 16 European countries



Source: 2018 JRC COLLEEM survey (Urzi Brancati, Pesole and Fernandez Macias, 2020[3]), JRC Publications Repository - New evidence on platform workers in Europe, https://publications.jrc.ec.europa.eu/repository/handle/JRC118570.

Working hours

The limitation of COLLEEM being a self-administered online survey becomes more stringent when analysing data on working conditions, in particular about the income earned via platforms. To gauge the working conditions of platform workers, two dimensions must be looked at, namely total hours worked and the income generated from them.

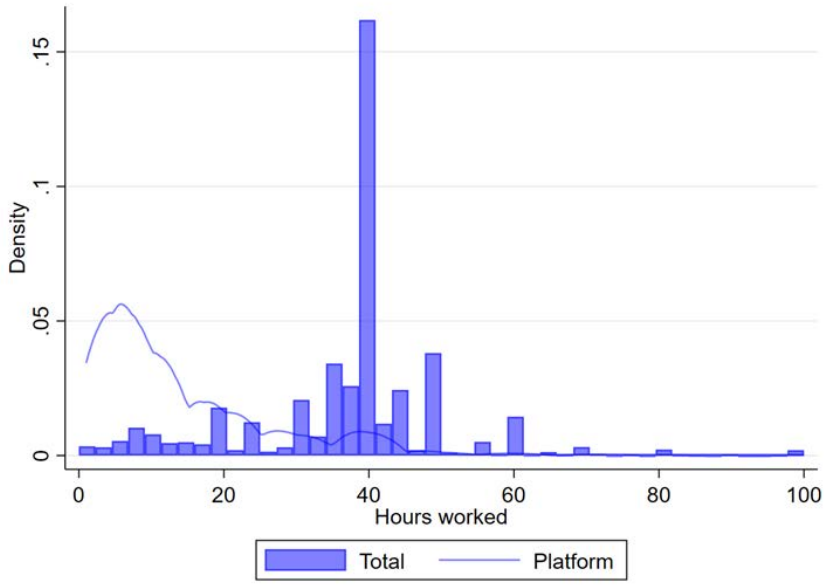
COLLEEM asks respondents about the total number of hours worked (both in online and offline labour markets) and the number of hours spent on platform. Figure 2.4 shows that most platform workers work around a total of 40 hours per week. (Urzi Brancati, Pesole and Fernandez Macias, 2020[3]) find that among main platform workers, 25% report to be employees, while among secondary platform workers this share increases up to 36%. These findings suggest that a high share of platform workers have additional regular jobs and use digital labour platforms as a secondary source of income. When considering hours worked via platform, Figure 2.4 shows a distribution skewed toward the left. Indeed, 44% of platform workers work less than 10 hours per week via platform, while above 60% spend less than 20 hours supplying labour via platform.

COLLEEM asks survey participants “how many hours do you work via online platforms?”. Answers to this question might underestimate the time spent waiting for an assignment or for searching online. Additionally, the survey asks on what basis platform workers get paid: about 69% of respondents report to get paid based on the task performed, which implies that many of them must undertake a substantial share of unpaid work in order to get paid work.

When considering the quality of the time spent on platforms, 54% of platform workers declare to work long hours, 68% claim to work at night and 74% to work during the weekend, with little variation among types of services. Generally, platform workers seem to concentrate most of their work in atypical or unsocial hours, implying worse working conditions and quality of job available on platform.

Figure 2.4. Total number of weekly hours worked offline and online by platform workers

Average across 16 European countries



Source: 2018 JRC COLLEEM survey (Urzi Brancati, Pesole and Fernandez Macias, 2020[3]), JRC Publications Repository - New evidence on platform workers in Europe, https://publications.jrc.ec.europa.eu/repository/handle/JRC118570.

Income earned via platform workers

COLLEEM also elicits information about how much platform workers get paid for their last task, in an attempt to construct an indicator of payment per hour and payment per task for the different platforms and occupations. To minimise the effect of outliers, Urzi Brancati, Pesole and Fernandez Macias (2020[3]) restrict the sample to a pool of consistent respondents, and provide information on the average payments received for the 7 most popular platforms in the dataset. Then they calculate the median payments for the selected platforms in the COLLEEM dataset. These data are only indicative, due to both the small number of observations and the fact that the values reported are averaged across the 16 countries and for all types of services. Indeed, the price of a similar service may vary according to the country (e.g. a Uber ride in Paris or in Lisbon) and for those platforms offering several types of tasks, as such as Freelancer or PeoplePerHour, the variation across task-types could be substantial. The authors report that "the lowest median value in Freelancer is €5 per hour for micro-task jobs and €22 per hour for interactive services. There are no other official sources we could use to compare our findings with; however the Fair Crowd Work website collects information on the median payment in some selected platforms. The only two platforms that overlap are Clickworker and Upwork for which they report respectively a median value of €2.92 and €12.91".

Urzi Brancati, Pesole and Fernandez Macias (2020[3]) also report an estimate of pay per hour for the different type of tasks. According to their findings, the highest hourly paid tasks are software (EUR 23) and interactive services (EUR 16). Clerical, professional and sales tasks are all paid around EUR 14 per hour, on-location services and transport vary between EUR 9 and EUR 12, while the least paid are micro-tasks, at about EUR 6 per hour.

Psycho-social conditions

Finally, COLLEEM includes some questions on working organisation and the specific psycho-social conditions of platform work. As a result, half of platform workers find their work stressful, monotonous and unhealthy. Regarding working conditions, 80% of platform workers declare to be able to choose the pace of their work, although 70% declare to be under constant monitoring from the platform. Finally, two-thirds of platform workers consider ratings by clients as an important feature to escalate platform work, and declare to interact with peer platform workers.

Why does the classification of platform workers matter?

Platform work blurs the line between dependent and self-employment[5]. Platform workers are typically classified in labour force statistics as own-account workers. However, this classification is often incorrect since, like employees, they often have limited control over their work (e.g., in some cases they cannot determine the prices of the services they provide, they are required to wear uniforms, they cannot choose the order of their tasks, etc.) and/or are dependent on their clients/employers in other ways (e.g. financially). Control may be exerted via technology-enabled monitoring, with the algorithm taking the place of a traditional manager, see Pesole (2019[5]) for a conceptual discussion on labour platform and algorithmic management.

The classification of platform workers as self-employed status has the effect of excluding them from rights, benefits and protections that are typically available to employees. One major concern is that some workers may be incorrectly classified as self-employed; and this allows platform operators to avoid regulation and taxation, giving them a competitive advantage over compliant firms in the 'traditional' economy and at the workers' expense (Urzi Brancati, Pesole and Fernandez Macias, 2020[3]).

With new technologies blurring the lines between employment and self-employment, the capacity of labour inspectorates to monitor and detect breaches of labour regulations becomes crucial. For example, Spain has developed campaigns targeted at false self-employment in platform work, including a dedicated operative procedure providing specialised training to inspectors and implementing regional pilot programmes.

At the individual level, filing a complaint with a court against platforms can be daunting. It can be costly, complicated, and the outcome is often uncertain. In addition, workers may worry about retaliation whereby the platform operator removes access to the platform. Where these barriers exist, and where the consequences of abuse are minimal, platform operators may have little incentive to correctly classify workers. To address that issue, some governments have made it easier for platform workers to challenge their employment status, by placing the burden of proof on the employer rather than on the employee or by reducing court fees and by simplifying procedures.

Platforms are often described as intermediaries providing the infrastructure needed for the worker to find clients. However, this makes it hard to agree on who the employer is. Platform work typically involves a multiplicity of clients and tasks of a very short duration, even if these tasks are sometimes carried out on the premises of the client. Some authors have argued that the question of who is responsible for worker rights and protections should be analysed from the perspective of the key employer functions – from hiring workers to setting their rates of pay (Adams-Prassl and Risak, 2016[6]). The outcome of such an approach would be that employment law obligations are spread across multiple legal entities, rather than ascribed to a single employer.

There has been some discussion about whether the regulation of temporary agency work (TWA), which also feature multi-party (or triangular) employment relationships, could serve as a model for the regulation of platform work (OECD, 2019[7]). In TWA, the employment relationship is generally between the worker and the agency, and the latter is responsible for ensuring that labour law is complied with. It is not clear to

what extent the TWA experience might be a useful example for regulating platform work (Lenaerts et al., 2018[8]) – although the TWA model seems to have been accepted by many platforms in Sweden (Söderqvist, 2018[9]) and several platforms worldwide have taken the initiative to treat their workers as employees (Cherry and Aloisi, 2017[10]).

Key policy issues requiring better evidence

Even when classified as self-employed, some platform workers share some characteristics of employees. They experience some form of dependence and/or subordination in their working relationship. Moreover, some platform workers may be facing a power imbalance vis-à-vis the platform operator, which could result in lower pay and worse working conditions than would be the case under market conditions. When classified as self-employed, platform workers do not generally benefit from the same legal protections as employees in terms of collective bargaining rights, social protection, and access to training. In all these fields, inadequate and uncertain evidence hampers effective policy responses.

Collective bargaining rights of platform workers

Collective bargaining can give platform workers more say on their working conditions (while tailoring solutions to the sector or occupation), countering power imbalances in relationships between firms and workers (Lane, 2020[11]). However, the standard approach in antitrust enforcement has often been to consider all self-employed workers as undertakings, and therefore any collective agreement reached by platform workers as a cartel.[6]

Countries have followed different paths for granting collective bargaining rights to the self-employed. In some cases, regulators and enforcement authorities have taken a case-by-case approach to avoid a strictly procedural analysis of cases involving those workers with little or no bargaining power and exit options. In several countries (e.g. in France, Italy, Spain, etc.), independent unions of platform workers are already de facto negotiating working conditions for their members even if they are classified as self-employed, without any intervention from national antitrust authorities.[7] Moreover, some independent unions have been created (e.g. in Italy and the United Kingdom), especially in the private hire or food delivery sectors. Unions' engagement with platforms on behalf of non-standard workers has led in some cases to the signature of collective agreements as in Sweden and Denmark.

Fair pay

There are concerns about imbalances of power and evidence that some platform workers earn below the living wage (ILO, 2018[12]). For standard employees, legally binding minimum wage can help address in-work poverty, and many studies find that small increases in the minimum wage from a moderate level have no negative employment effects. In jurisdictions where a minimum wage exists, significant difficulties surround extending minimum wage legislation to platform workers. These include measuring what counts as work (i.e. should platform workers be paid for the time that they have an app open and/or the time they spend waiting/searching for tasks?) and how to deal with work carried out across national borders. In practice, some jurisdictions around the world have extended the right to a minimum wage to some categories of platform workers.[8]

Working time

Traditional concerns around working time revolve around the issue of excessive working hours. Labour legislation usually contains rules limiting working hours and requiring periods for rest and recuperation, including weekly rest and paid annual leave. Moreover, in the case of certain micro-task platforms, workers spend as much time searching for tasks as they do in performing them (Kingsley, Gray and Suri, 2015[13]).

Some platforms have introduced their own working hour limits (e.g. Uber requiring drivers to rest for 6 hours after driving for 10 hours continuously in the United Kingdom) and workers have adopted their own informal practices such as daily routines and quota setting to manage their time (Lehdonvirta, 2018[14]). Data collected through platforms can help in monitoring working time. In practice, extending working time protections to platform workers faces several obstacles: many platform workers have several clients/employers at any particular point in time, implying that monitoring overall working time (and allocating responsibility) may be very difficult if not impossible.

Dispute resolution

When workers have employee status, employment protection legislation usually protects them against breaches of contract obligations on the part of employers, including remedies for unfair dismissal and wage theft. In the case of platform workers, wage and working conditions are often set unilaterally by the platform (or the intermediary) or by the requester (i.e. the individual or company who posts tasks), with no scope for individual workers to negotiate any of the conditions that must be accepted in order to begin or continue working.[9] Similarly, the terms of conditions of digital intermediation services often establish that the platform can deactivate a worker's account without providing a justification, sometimes even without previous warning – see e.g. (Kingsley, Gray and Suri, 2015[13]).[10]

Occupational safety and health

Many platform activities are in the transport sector, where the risk of road accidents is high. Evidence suggests that the arrival of ride-sharing is associated with an increase of 2-3% in the number of motor vehicle fatalities and fatal accidents as a result of increased congestion and road utilisation (Barrios et al., 2018[15]). There are also risks associated with online work – both physical and psycho-social, such as visual fatigue; musculoskeletal problems; work-related stress; chronic job and income insecurity; and isolation. Again, the question of employment status is critical here as Occupational Safety and Health regulation often applies to employees only.[11]

Social responsibility of platforms

In some cases, platform operators have made commitments to improve working conditions, sometimes based on the understanding that their compliance with these commitments cannot be used to presume an employment relationship.[12]

Training for job opportunities

Platform workers receive very little training and can be stuck in a low-productivity trap, or may be at risk of deskilling. Some governments have started to inform jobseekers of new opportunities in the platform economy, while at the same time ensuring the quality and sustainability of their work.[13]

Bringing digital platform employment into the tax and benefits system

As many platforms capture information about the payment exchanged for services (in addition to acting as an intermediary for these payments, in some cases), some countries have attempted to take advantage of this feature in order to tackle the underreporting of income for services carried out through platforms and to bring work traditionally performed informally into the formal economy.[14]

In emerging economies where informal employment has a high incidence, the platform economy may constitute an opportunity for many workers to formalise, since it can reduce the costs of formalisation and improve monitoring of economic activity through the digitalisation of transactions (Alonso Soto, 2019[16]). In practice, some platforms are already playing a role in facilitating access to social protection for their

workers. For example, in Indonesia, GoJek offers help to its motorcycle taxi drivers to subscribe to the government health insurance program, while Grab Bike motorcycle taxi workers are automatically enrolled in the government's professional insurance programme.

Cross-border issues

Many types of platform work are, by nature, “cross-border”. The intermediation of digital platforms allows workers to be based anywhere in the world to carry out tasks and offer services to clients – private individuals or corporate entities – located in a different geography. This only applies to so-called “online” platform work (as opposed to “on-location” platform work, like ride hailing and food delivery), which ranges from micro-tasks such as image recognition to more complex services like software development, graphic design, translations, social media and content editing.

In practice, around 80% of globally commissioned online work is done for clients based in OECD countries, whereas only 20% of the workers who carry out these tasks are based there. This lopsided picture poses significant challenges in terms of labour market fairness and efficiency. Given the considerable difference in the costs of living and working outside OECD countries, outsourcing online tasks may lead to unfair competition between workers based in different geographies. This may lead to a race-to-the-bottom in working conditions, to the divergence of standards in social policy provisions and to uncertainty as regards the jurisdiction of law and standards applicability across different geographies.

Filling the data gaps

Since the emergence of online platforms, there have been several attempts to estimate the number of platform-mediated workers. Initial attempts made use of existing data sources, combined with strong assumptions, and led to varying estimates of the size of the platform economy. Since then, official statistical agencies have begun to introduce questions on platform workers into Labour Force Survey supplements and Internet Usage Surveys, with wide variation in results. These efforts highlight some of the difficulties in measuring platform-mediated workers (see Chapters 2 and 3).

First, a key problem of surveys is to ensure that respondents understand the meaning of platform-mediated work. The appropriate method depends on the research objectives, the resources available, and the trade-offs faced by researchers and statistical agencies. Many respondents report being platform-mediated workers due to the poor definitions presented to them, e.g. when asked whether ‘they make use of a computer or mobile app in their job’. Adjusting for obviously incorrect responses can considerably reduce the estimated number of platform-mediated workers.

Second, there are inconsistencies across countries in how platform-mediated workers are measured. For example, some surveys do not differentiate between capital and labour platforms. The vast majority of surveys use the last 12 months as reference period, whereas others use a single reference week in order to be consistent with labour force survey results.

The use of some big-data sources can allow researchers to improve their research question as new platforms enter the market. However, methodologies that rely on web scraping may have problems of consistency over time as platforms are added, or dropped, from the list of platforms that are monitored while other platforms may be created or cease to exist. In addition, use of administrative data is likely to be very limited due to differences in administrative systems across countries.

Finally, while the use of official surveys such as Labour Force Surveys is likely to provide accurate and robust estimates, problems of sample size reduces their suitability for gaining insights into the characteristics of platform-mediated workers. Most estimates of the number of platform-mediated workers are in the range of 0.5% to 2% of total employment. Even though sample sizes of labour force surveys are

typically large, they will lack precision about specific characteristics of small groups in the population, such as gender or occupation.

Although the problem of sample size can be overcome through administrative data (e.g. social security or tax data), these have their own shortcomings that affect the measurement of platform work, e.g. workers may be below VAT reporting thresholds. Partnerships between government agencies and online platforms to improve tax collection have the potential to improve administrative data sources.

There are other emerging sources such as data compiled by platforms themselves or 'platforms of platforms' that can be used as stand-alone sources or to complement results from survey and administrative data sources. Although there are significant risks that obtained data is biased, this is typically the case of data on the demand for platform jobs and the supply of platform workers produced by new data compilers such as AppJobs Institutes (https://www.institute.appjobs.com/).[15] For instance, recent studies have analysed trends of selected types of platform workers before and after the Covid-19 outbreak, and the gender and/or age distribution of employment in the gig and traditional economies by industry and cities. Other reports have focused on the challenges posed by the increased use digital platform employment for the 'future of work'. Data on gig jobs and gig workers, including earnings and hours worked, are made available to researchers worldwide for studying the platform economy and the future of work. While there are several issues related to the nature of data compiled by platforms on digital platform employment and work and their representativeness, the availability of timely and granular data provide clear advantages for data analysis and policy developments on the future of work in a foreseeable context of growing incidence of platform employment.

A paucity of information about the prevalence of platform work and the characteristics of the individuals engaged in it hinders the development of adequate policy. While existing labour force surveys and household surveys provide valuable information on self-employment, fixed-term and part-time work, they have a hard time in identifying platform workers. While other types of statistical sources (such as the COLLEEM survey) as well as data directly provided by platforms (e.g. transaction records such as those submitted by platforms to tax authorities) can provide much needed information, official statistics have a very important role to play in providing the evidence needed to address the broad range of policy questions described above. The remainder of this Handbook focuses on concepts and definitions that statistical offices and other data producers could use to measure platform employment, while also reviewing existing data collection instruments and designing model questionnaires accordingly.

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Notes

[1] This chapter draws from the "Regulation of platform" policy note of the OECD Going Digital toolkit (Lane, 2020[11]).

[2] The countries covered are Croatia, the Czech Republic, Finland, France, Germany, Hungary, Ireland, Italy, Lithuania, the Netherlands, Portugal, Spain, Sweden, Slovakia and Romania.

[3] According to the resolution adopted by the 19th International Conference of Labour Statisticians (ICLS), employment "comprises all persons of working age who during a specified brief period, such as one week or one day, were in the following categories: a) paid employment (whether at work or with a job but not at work); or b) self-employment (whether at work or with an enterprise but not at work)", https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms_230304.pdf.

[4] Those data refer to platform workers who only perform one type of task, as those performing more than one type of tasks (i.e. delivery and micro-task) use more than one platform by default.

[5] The problem, however, is not limited to the platform economy – many hairdressers, plumbers, and gardeners have faced similar challenges in the past. In some cases, the issue may be that these workers are falsely classified as self-employed in order to avoid regulation, or to access preferential tax treatment.

[6] The recent plight of rideshare workers in Seattle illustrates this point. In order to help the wages and working conditions of drivers on ridesharing platforms, the city introduced an ordinance to allow the workers to collectively bargain with ridesharing companies. However, the law was challenged in court because it violated anti-trust laws.

[7] The risk associated with this route is that it potentially creates uncertainty since it could be reversed without any legislative reform. However, this type of approach may receive further support from the European Commission in future. In March 2020, the European Commissioner for Competition said that she was examining whether the EU could help "people who work in a weak negotiating position" by giving "sort of European level guidance as to how to allow people to organize" without it being seen "as a cartel" (Bloomberg.com, 2020[17]).

[8] Since January 2018, for example, New York City has imposed a minimum wage for Uber and Lyft drivers.

[9] For example, on certain micro-task platforms, requesters can refuse completed tasks without providing a reason, in which case the worker receives no pay – see e.g. (Kingsley, Gray and Suri, 2015[13]).

[10] In practice, there are precedents of social partners who have played a role in establishing simplified dispute resolution systems for the platform industry. For instance, three German platforms and the German Crowdsourcing Association drafted, in 2015, a Crowdsourcing Code of Conduct and established in 2017, in conjunction with five other platforms and IG Metall, an "Ombuds office" to enforce the Code of Conduct and resolve disputes between workers and signatory platforms – see (ILO, 2018[12]).

[11] In France, the legislator has granted certain rights to platform workers through the August 2016 El Khomri law (or *loi de travail*) on labour, modernisation of social dialogue and securing of professional careers. Specifically, in cases where the platform determines the characteristics of the service provided and where

the worker earns more than EUR 5 100 per year through the platform, the platform must provide reimbursement for insurance against occupational accident and illness.

[12] In France, the 2019 *Orientation des Mobilités* law introduced the possibility for platform operators to draw up a social responsibility charter with a certain number of guarantees for workers.

[13] For instance, the Finnish Public Employment Service has integrated a pilot called "New Forms of Work and Entrepreneurship", into its digital job-market platform (Työmarkkinatori) to offer opportunities to jobseekers in terms of new forms of work and entrepreneurship, by linking them to invoicing companies and digital job mediation platforms. The Israeli Ministry of Labour and Social Affairs offers training in digital skills in order to allow workers to take advantage of opportunities in the platform economy. It operates a few small pilot programmes targeted at workers in new forms of work. One of these offers training to particular groups (people with disabilities, Arab women, ultra-Orthodox) on using online trading platforms and making a living on the global online market.

[14] In order to tackle the underreporting of income, some countries have taken some policy initiatives. In Estonia, passenger transport platforms share information on the financial transactions between customers and drivers with tax authorities so that the tax authorities can prefill drivers' tax forms. Since 2016, in Belgium, tax advantages (i.e. 10% income tax instead of 33%) have been granted to workers who earn under EUR 5000 annually through officially recognised platforms that withhold taxes at source and report earnings to tax authorities. As well as ensuring that taxes are paid, this preferential tax treatment was designed to incentivise side work in the platform economy.

[15] AppJobs.com is a platform of platforms that has 1.3 million members in 45 countries. Data are available for any required frequencies (daily, weekly, monthly or annual) and individual characteristics (gender, age, etc.). They enable to monitor the demand for gig jobs and supply of gig workers by type of freelancing and gigs, industry, cities and region.

3 Conceptual framework, concepts and definitions

This chapter aims to provide a conceptual framework that explains the nature of digital platform employment and work, while accounting for the great variety of digital platforms. The chapter first describes the digital economy and introduces the concept of *employed persons in the digital economy*. It then provides a definition of *digital platforms*, and provides a general overview of the landscape of digital platforms. The chapter provides a general definition of digital platform work. Finally, it focuses on digital platform employment and outlines a flexible framework that users can adjust to consider some of the following elements: i) the form of work; ii) whether a given measurement includes the provision of services or/and the production of goods; iii) whether the measurement is restricted to digital platform employment taking place externally or internally to the digital platform. The flexibility of the framework reflects different policy objectives and user needs.

Introduction

The objective of this chapter is to provide a statistical framework that sufficiently captures and explains digital platform work and digital platform employment, taking into account the variety of types of digital platforms linked to them. Currently there is no internationally agreed terminology and standard definitions of digital platform work and related concepts. Different terms and concepts with different scopes and objectives are often used interchangeably. As a result, statistical measurement suffers from a lack of clear understanding of the phenomenon, and available statistics are not comparable nor harmonised at the international level. This situation calls for a comprehensive statistical framework that organises the different components and concepts of what can be broadly termed digital platform work, in order to meet the urgent need for data necessary to inform policy debates.

The chapter is structured in four different sections. The first section describes the statistical framework of the digital economy from an economic viewpoint. It introduces the concept of *employed persons in the digital economy*. This is distinct from those of *digital platform work* and *digital platform employment*, but is of high relevance when, for example, estimating GDP growth and productivity in the digital economy, and its contribution to the economy as a whole.

The second section provides a definition of *digital platforms* that is relevant for identifying digital platform work. These digital platforms are considered to be value-generating, digital interfaces that intermediate between three distinctive agents (the owner of the platform, the worker providing the services, and the user or consumer of these services). Digital platforms provide services and tools that are under the control of the economic unit that owns the digital platform, and enable the owing economic unit to monitor the process and to exercise some degree of control over the productive activities (i.e. work) taking place on the digital platform. This section also provides a general overview of the landscape of digital platforms, including (but not limited to) digital platforms relevant for the identification of digital platform work. This overview provides categories for different types of digital platforms, distinguishing between digital platforms offering services, digital platforms facilitating and mediating exchange between users, and digital labour platforms mediating work.

The third section provides a general definition of digital platform work. Based on the definition of work provided by Resolution I of the 19th International Conference of Labour Statisticians (ICLS), digital platform work is defined as any productive activity performed by persons to produce goods or provide services carried out through or on a digital platform. The definition is broad and includes different forms of digital platform work. These include *digital platform work for own-use*, *digital platform employment*, *digital platform unpaid trainee work*, *digital platform volunteer work* and *other work activities carried out on or through a digital platform*. As such, the definition recognises that digital platform employment is only one out of many forms of work that can take place on or through a digital platform.

The last sections focus on digital platform employment. It outlines a flexible framework that contributes to a comprehensive measurement of digital platform employment, and that provides the possibility to focus on one or more specific parts. Depending on policy interest and objectives, as well as on available statistical sources, national statistical offices and users can adjust the scope of a given measurement. This adjustment of scope may consider one or more of the following elements: i) the form of work of concern; ii) whether a given measurement includes the provision of services or/and the production of goods; iii) whether the measurement is restricted to external digital platform employment only or/and targets internal digital platform employment; iv) whether all types of digital platforms that meet the definition of digital platforms relevant for measuring digital platform work are included; and v) whether the measurement is restricted to a specific type of digital platforms. The flexibility in the framework and in its different components, reflects different policy objectives and user needs, as well as the recognition that a range of statistical sources are needed to provide in-depth and comprehensive data on digital platform employment and of its different components.

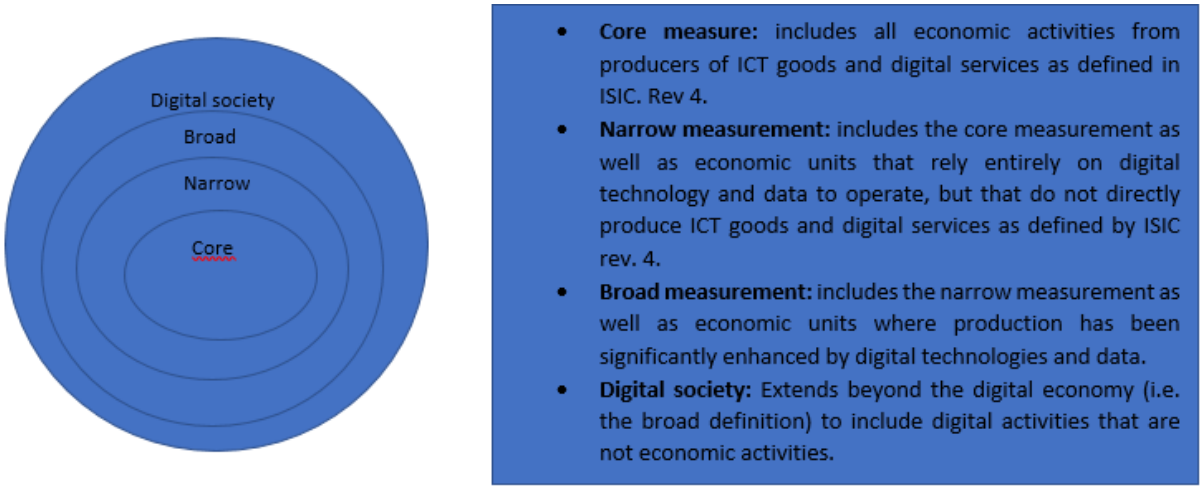
The digital economy

Advances in ICT as well as the development of cloud computing, artificial intelligence and other innovations have spurred the growth of the digital economy, in which both people and businesses increasingly rely on digital modes of exchange for economic and social purposes. The digital economy, in its broadest definition, now spans all sectors of the economy; it has been characterised as

> *"all economic activity reliant on, or significantly enhanced by the use of digital inputs, including digital technologies, digital infrastructure, digital services and data. It refers to all producers and consumers, including government, that are utilising these digital inputs in their economic activities" (OECD, 2020, p. 32[1]).*

Methodological work currently is ongoing to develop a framework for measuring the digital economy in economic statistics, including in the context of the System of National Accounts (SNA). The OECD definition of the digital economy provided above is translated in a measurement perspective built around four layers, moving from the centre towards broader definitions in its outer layers (OECD, 2020[1]).

Figure 3.1. Different layers of the digital economy



Source: OECD (2020[1]), *A G20 Roadmap toward a Common Framework for Measuring the Digital Economy: A report for the G20 Digital Economy Task Force (DETF)*, OECD Publishing, Paris, roadmap-toward-a-common-framework-for-measuring-the-digital-economy.pdf.

- The *core layer* in Figure 3.1 includes all economic activities related to the production of ICT goods such as semiconductors and processors, computers, smartphones, software and algorithms, as well as digital services such as internet and telecom networks.
- The *narrow layer* includes all core digital activities, but also economic units that rely on digital technology and data to operate, such as mobile payment platform, e-commerce or digital labour platforms.
- The *broad layer* includes all economic units included in the narrow layer but also units whose production has been significantly enhanced by digital technologies and data.
- The final layer, i.e. the *digital society*, includes all digital activities undertaken by individuals in a society that are not carried out for pay or profit.

The four different layers of the digital economy have implications for labour statistics. The different forms of work and, in particular, of employment are significantly impacted by digital activities, with implications for the calculation of productivity in the different layers of the digital economy. Economic statistics can be viewed as representing one side of the digital economy while labour statistics capturing another side of the same phenomenon. These two different perspectives are complementary; both are necessary in order to

gather comprehensive data on the digital economy. Yet it is also important to be aware of their differences. From the perspective of economic statistics, the number of employed persons engaged by economic units of the different layers of the digital economy is crucial information. The concept of *employed persons in the digital economy* is, however, conceptually different from that of *digital platform work* or of *digital platform employment*. Employed persons in the digital economy would include all workers engaged by the enterprise belonging to the digital economy, independently of whether these work activities are conducted through or on a digital platform; from this (economic) perspective, the essential feature is whether the economic unit is within the digital economy or not. From the point of view of digital platform work, however, the essential aspect is whether the work (paid or unpaid) is carried out through or on a digital platform.

The two perspectives are different in nature and objective but complementary and to some extent overlapping. While the economic unit that owns and develops the digital platform would be part of the narrow layer of the digital economy, the digital platform worker would more likely form part of the broad layer of the digital economy. A digital platform is owned and controlled by an economic unit that relies on digital technology and digital information for its own production. These economic units do not typically produce ICT goods or services but use ICT technology and data, hence they should be categorised as belonging to the narrow layer. A digital platform worker, however, uses the digital platform as part of carrying out the work. Some digital platforms workers could be completely dependent on the digital platform, as their work could not have been conducted at all if not facilitated by the digital platform, while others might use the digital platform as a substitute or complement to other ways of conducting the work. The first group of digital platform worker would be included in the narrow layer of the digital economy while the latter would be included in the broad layer. Workers carrying out digital platform work without the intention of generating an income or profit, such as volunteer work, would form part of the broader concept of digital society.

What are digital platforms?

A number of different definitions of digital platforms have been provided for different purposes (see for example ((Eurofound, 2018[2]); (De Stefano, 2016[3])). These definitions typically underline slightly different aspects of what is perceived as a digital platform. In some cases, they also imply a different scope of what should be measured (for example, by limiting the definition to digital platforms that mainly intermediate services, or by only including labour platforms). Nonetheless, there seem to be a general understanding of what a digital platform is. Most definitions view a digital platform as a "digital interface" or an "online service provider", in these definitions, the digital platform is positioned between the providers of the services or goods and their clients or customers (see, for example, (ILO, 2018[4]), (OECD, 2019[5])).

The recognition that digital platforms intermediate between three distinctive agents suggests that the digital platform needs to be understood as an economic unit separated from the provider and the receiver of the goods and services. The digital platform is owned and operated by an economic unit (i.e. an enterprise) that does not provide a digital solution to enterprises or consumers as end-products in themselves, but that rather provides digital services or applications that enable or facilitate the direct or indirect interaction between the provider and the receiver of the goods and services. The service or tool of the digital platform nevertheless remains under the control of the economic unit that owns it. This makes digital platforms distinct from other digital solutions, programs and platforms (for example windows, java etc.) that are sold as products to other enterprises and consumers. The definition of digital platforms as distinct agents also allows the enterprise that owns and controls them to exercise some degree of control over the activities taking place on the digital platform and gives it some capacity to monitor the process. This is different from only having the rights of the digital products but where no control is exercised over the activities that take place on the digital products. This control would typically be set by the rule of participation and work process in the platform as set by their terms of service agreements (ILO, 2021[6]).

The objective of digital platforms is to create value added through network effects. This additional value can take the form of profits for the economic unit but also of additional social value. Examples of the latter would include non-profit digital platforms that rely on voluntary contributions from the contributors (Wikipedia) or that are directed toward the creation of collective goods, such as "citizen scientist" crowdsourcing projects. Such digital platforms would not create direct monetary value but would contribute towards creating public goods benefitting society as a whole.

Digital platforms provide the digital tools and services that enable the delivery of the service or good. In many cases, however, the digital platforms do no not limit its services to merely matching providers and receivers, but also provide an integrated set of tools or services that allow transaction and payments to take place on the platforms.

Based on these different characteristics, digital platforms relevant for identifying digital platform work are considered to include any *digital interface that generates economic and/or social value and that intermediates between three distinctive agents (the owner of the platform, the provider of labour services, and the final user of the goods and services produced)*. The digital platform provides services and tools that remains under the control of the economic unit that owns it and enables the owing economic unit to exercise some degree of control over the productive activities (i.e. work) taking place and to monitor the work process on the digital platform.

These digital platforms can be identified by the following attributes:

- it acts as a digital interface or platform between multiple parties:
  - the provider (or worker) that provides the services or goods; and
  - the receiver (customer/consumer) that receives the services or goods
- it generates economic and/or social value through network effects;
- it provides a common set of integrated digital tools and services that enable the delivery of the services or goods, and the monitoring of the process;
- it incorporates an assessment or evaluation of the delivery of the service or goods through an integrated rating, review mechanisms or similar tools; and
- it sets the rule of participation in the platform through their terms of service agreements, which can include aspects such as:
  - who can participate and how entry is gained?
  - how are contracts and prices determined?
  - how disputes will (will not) be handled?

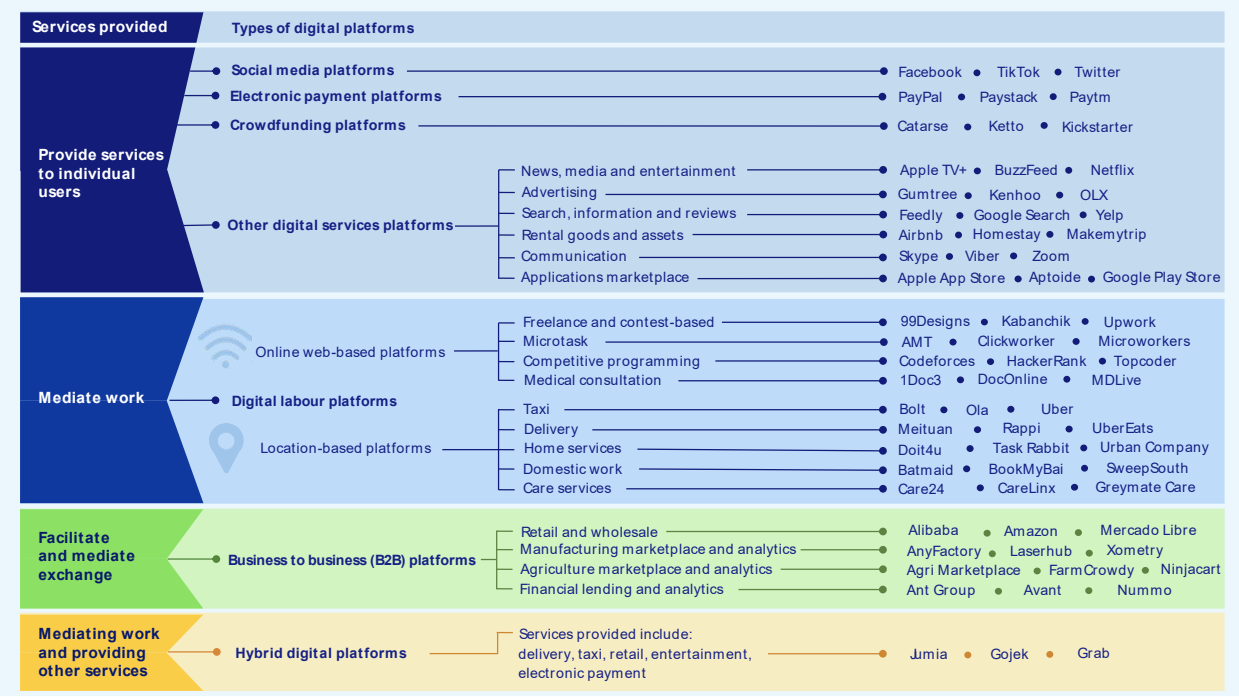
Applying these attributes creates a broad definition of digital platforms that can constitute the foundation for a comprehensive conceptual framework on digital platform work without being too restrictive at the outset. This broad definition will allow statistical offices to provide a comprehensive measurement as well as to focus on some specific parts of digital platform work depending on national need and context. This approach also responds to the need to have a relatively flexible conceptual definition that takes into account the future evolutions of digital platforms, structure and business models.

A typology of digital platforms[1]

Digitalisation is permeating into different sectors of the economy, with digital platforms facilitating interactions between firms or individuals through digital services, apps and the internet (OECD, 2019[5]). Figure 3.2 provides the broad landscape of different types of digital platforms including digital platforms that do not meet the definition provided previously, showing that almost all major economic sectors are witnessing their penetration. The use of digital platforms in the various sectors of the economy can be classified into two categories: i) those that provide digital services or products such as search engines or

social media, among others; and ii) those that facilitate and mediate between different users, such as business to business (B2B) and digital labour platforms.

Figure 3.2. Landscape of digital platforms



Source: ILO (2021[6]), World Employment and Social Outlook: Digital transformations of the world of work: The growing role of digital labour platforms, https://www.ilo.org/global/research/global-reports/weso/2021/WCMS_771749/lang--en/index.htm.

Digital platforms offering services to individual users

A range of digital platforms from social media such as Facebook or TikTok to communication platforms such as Skype, Zoom, WhatsApp or Viber offer services to individual and business users, and increasingly play an important role in the socio-economic lives of people around the world. Digital platforms enable the electronic transfer of products such as software programs or music streaming that are delivered digitally and remotely to consumer and businesses. Such platforms have had profound effects on a number of traditional industries, including the news and media industry, whereby online news and media platforms have emerged to provide news in real time.

Digital platforms facilitating and mediating exchange between users

The digital economy comprises both B2B and business to consumers (B2C) platform models (Figure 3.2). In both the B2B and B2C domain, the retail sector has witnessed an exponential rise in digital platforms, with important implications for how traditional retail businesses conduct their operations and for their employment consequences. Well-known online retail platforms include Amazon, Alibaba and Flipkart, among others. These platforms often act as a third party, mediating transactions between, for example, small and medium enterprises (SMEs) and micro- entrepreneurs, on one side, and final customers, on the other. For example, 60% of the products sold on Amazon are from third-party sellers (with 1.7 million SMEs benefitting from the platform) (Bezos, 2020[7]).

Digital platforms are also penetrating into other sectors such as manufacturing, agriculture and finance, but they are still in a nascent stage. In the manufacturing sector, platform networks connect firms or

suppliers in a timely manner with other firms or individuals, based on the customer's needs and geographical proximity. For instance, Xometry and LaserHub connect suppliers with material processing industry, while Tao-factory, which operates mainly in garment and light industries, connects enterprises with consumers or customers on e-commerce platforms such as Taobao. Once the buyer on the e-commerce platform places the order, the value chain is set in motion, and the order is manufactured and then delivered (Zeng, 2018[8]).

In the agricultural sector, digital penetration has largely been through the provision of farm management software tools and technologies via mobile applications or the Internet of Things. These digital technologies support small farmers to create optimal conditions for sowing, watering, fertilizing and harvesting, to access markets and improve productivity. Some digital platforms such as Agri Marketplace or Open Food Network also connect farmers with markets and consumers. Similarly, large digital transformations are taking place in the financial sector, with transactions mediated through platforms that provide a range of financial services, or payment platforms such as PayPal, Paytm, VENMO or TransferWise.

Digital labour platforms mediating work

Technological advances in the labour market have led to new ways of organising work, thereby transforming both work processes and how people work. In this regard, digital labour platforms have emerged as a distinctive part of the digital economy, because of the way they connect businesses and clients to workers. These platforms facilitate and mediate work between individual suppliers (platform workers and other businesses) and clients, or directly engage workers to provide labour services. The work delivered by workers on these platforms are commonly referred to as "platform work" or "gig work". The work on digital labour platforms can be categorised into two types: i) online web-based platforms, where tasks are performed online and remotely by workers; and ii) location-based platforms, where tasks are performed in real physical locations by individuals.

Online web-based labour platforms offer a variety of services to both individual consumers and business customers. Four main categories can be distinguished, based on the duration and complexity of the tasks performed, as well as on the skills and remuneration of the workers involved:

- The first category includes freelance platforms such as Upwork, Freelancer.com and others, specialising in particular fields, such as translations, financial services, legal services, patent services, design and data analytics.
- The second category includes contest-based and competitive programming platforms such as 99Designs, Topcoder, HackerRank whereby workers compete with one another to solve complex programming problems within a designated time, with the winner(s) chosen by the clients to receive the award. Many workers also use these platforms to hone their skills.
- The third category includes micro-task platforms such as AMT and Clickworker, in which workers complete short tasks such as data annotation, data entry, data cleaning, accessing content (for example, visiting websites or social media sites to increase traffic), content moderation (the purging of violent and pornographic images from social media sites), copywriting or audio transcription.
- The fourth category includes professional service platforms for doctors or tutors such as MDLive, DocOnline or tutor.com, which allows individuals to access professionals in medicine, education or other fields for online consultations.

Location-based platforms offer services that often exist in traditional labour markets, such as taxi and delivery services, but differ in that the services delivered are mediated through the platform. There has been much debate in recent years around taxi and delivery platforms such as Uber, Deliveroo, Swiggy, Ola and others; yet there are other types of location-based platforms that offer a range of other services such as in domestic work, care provision or home services, wherein individual workers provide labour services to individual customers in their private homes or to businesses.

The work on digital labour platforms is often performed on a 'on-demand basis', wherein the logic of the "just-in-time" inventory system is applied to the labour process (Vallas, 2018[9]). Compensation is typically on a piece or task-rate basis. As workers are classified by the platforms as independent workers, they are often required to provide their own capital equipment ((Stanford, 2017[10]); (Drahokoupil, 2016[11])). Yet despite being classified as independent workers, they often lack the freedom and autonomy to organise their work, as algorithmic management practices are used to allocate, manage, supervise and reward these workers.

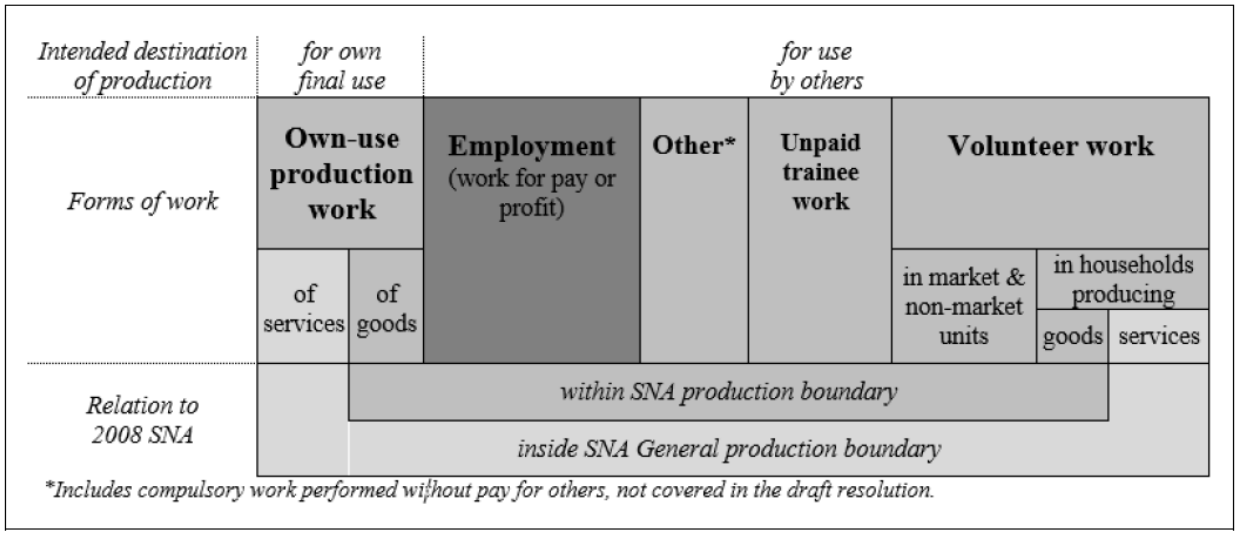
Forms of work and digital platforms

The concept of digital platform work is based on the concept of work as defined in the 19th ICLS resolution concerning statistics of work, employment and labour underutilization (19th ICLS resolution I). The 19th ICLS resolution I defines work as "any activity performed by persons of any sex and age to produce goods or to provide services for use by others or for own use" (Para 6, (ILO, 2013[12])). The statistical concept of work is broad and includes all activities within the SNA general production boundary. Depending on the intended destination of the goods and services produced and the form of remuneration, all activities defined as work can be categorised in one of five different forms of work. These are: i) own-use production work; ii) employment; iii) unpaid trainee work; iv) volunteer work; and v) other work activities (see Box 3.1).

Box 3.1. Work and the different forms of work under the 19th ICLS

The 19th International Conference of Labour Statisticians (ICLS), which took place in 2013, expanded the scope of labour statistics by recognising the need to collect data on different forms of work, paid and unpaid, on a regular basis. It introduced the first internationally agreed statistical definition of "work" aligned with the SNA general production boundary, and a framework that distinguishes different forms of work to support their separate measurement (see Figure 3.3). In this framework, employment is defined as work performed for others with the intention to generate pay or profit. Activities that contribute to production, but are done with a different intention than to mainly receive a remuneration, such as own-use production work, volunteer work and unpaid trainee work, are no longer included within the concept of employment but recognised as unique forms of work.

Figure 3.3. The five forms of work included in the 19th ICLS



Based on the framework provided in the 19th ICLS resolution I, and the concept of digital platforms as defined above, digital platform work can be defined as:

> *any productive activity performed by persons to produce goods or provide services carried out through or on a digital platform, AND:*
>
> *- the digital platform or a phone app **controls** and/or **organizes** essential aspects of the activities, such as the access to clients, the evaluation of the activities carried out, the tools needed for conducting the work, the facilitation of payments, distribution and prioritization of the work to be conducted; and*
>
> *- the work is for at least one hour in the reference period.*

First, this definition is broad and includes different forms of digital platform work. Building on the 19th ICSL Resolution, these include: i) *digital platform work for own-use;* ii) *digital platform employment;* iii) *digital platform unpaid trainee work;* iv) *digital platform volunteer work;* and v) *other work activities carried out on or through a digital platform*. As such, the definition recognises that digital platform employment is only one out of many forms of work that can take place on or through a digital platform.

Second, this definition emphasises the notion of control and organisation by the platform, which is essential to disentangle digital platform work and non-DPE work taking place via a platform. For example, a customer and a service provider exchanging via Teams or Zoom does not constitute digital platform work, as these two communication platforms do not offer integral services like ratings of participants, payments and matching of the two parties. Conversely, the classification as digital platform work is straightforward with platforms offering ratings of participants, payment services and algorithmic matching, such as Uber or Upwork. In between those two examples, classification can be difficult when a platform displays some but not all of the usual attributes of a digital platform. For instance, the French platform Doctolib allows patients to make appointments with doctors (hence completes a matching based on location and availability), or to organise a video consultation for which an online payment can be made; on the other hand, this platform does not rate doctors or patients, nor does it realise payments for physical consultations. In the case of Doctolib and other ambiguous situations, the classification as DPE work depends on the objectives of the statistical analysis and on the exact specification of its scope.

This broad concept of digital platform work includes activities within the SNA production boundary as well as activities such as direct volunteer work providing services that are outside the SNA production boundary but inside the general production boundary. Yet this broad concept would be difficult to capture with one single statistical source and would have limited analytical relevance or statistical value on its own. Rather, the concept of digital platform work should be seen as an overarching concept that consists of its different statistical components. These components can, as a starting point, be constructed around the different forms of work described in Figure 3.4, in order to reflect the intent of the digital platform work and whether the digital platform work is carried out for pay or profit.

- Digital platform work for own-use, i.e. the production of goods and services for own final use that is carried out on or through a digital platform. The defining characteristics of digital platform own-use production work is that both the producer of the good or service and the intended user of them is in the same household or is another family member. The household or family members both produce the goods or services as well as consume them with the interaction or intermediation of a digital platform. Digital platform own-use production work would, for example, include the production of household services within a household where a digital platform is used to organise and distribute the services between the different household members. Examples include the platforms S'moresUp or Piicnic.
- Digital platform employment, i.e. work performed for others on or through digital platforms with the intention to generate pay or profit. Digital platform employment includes a wide range of different activities such as persons selling goods through a digital platform or providing a variety of different services such as taxi and delivery services, clerical work, domestic cleaning and care services,

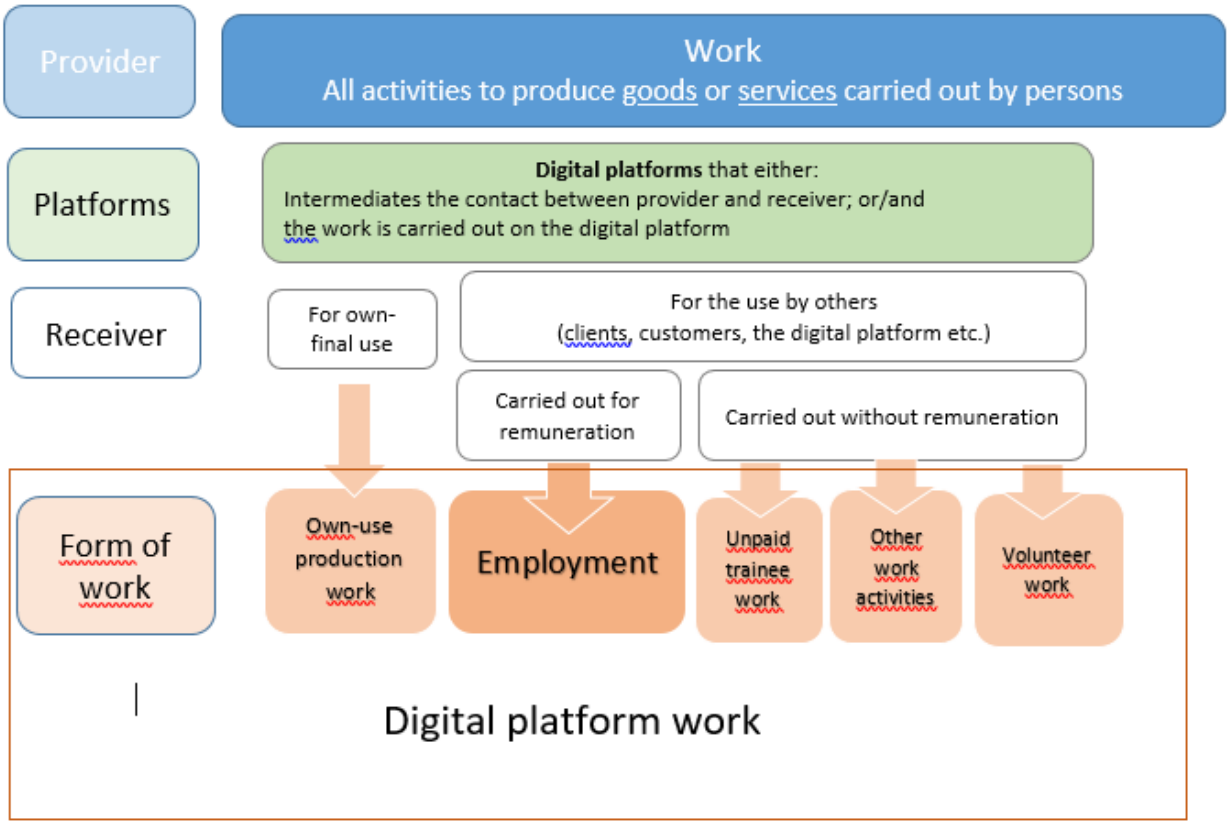
posting videos or entertainment, web or logo designers, software developers, doctors, tutors and many more. The defining characteristic of all these activities is that they are carried out through or on a digital platform with the main intention to generate pay or profit. It is likely that a large part of the work carried out in relation to the digital platforms previously mentioned would fall under this category.

- Digital platform unpaid trainee work, i.e. work performed for others on or through a digital platform without pay to acquire workplace experience or skills. This may potentially include a range of different activities with the critical feature that the person is producing a good or service for others to gain skills and work experience without remuneration, sometimes in order to gain access to paid employment. Possible examples include participation in competitive programming platforms (TopCoder, Hacker Rank) or design competitions (CoContest) when the intention is to gain or hone skills and not to participate with the intention of being compensated.
- Digital platform volunteer work, i.e. non-compulsory work performed on or through digital platforms for others without pay. Digital platform volunteer work includes activities that are carried out for others but without any intention to generate remuneration. This could include digital platforms used for organising community volunteering, players programming and uploading player-produced modifications into gaming programmes, crowdsourcing projects that seek input from "citizen scientists", whether to help identify galaxies in space, map croplands, catalogue satellite imagery, or work on open source platforms such as SourceForge, etc.
- Other work activities carried out through or on a digital platform include productive activities carried out through or on digital platforms that do not belong to one of the four forms of work previously defined. These could include forms of forced labour that takes place on or through a digital platform. The category is included to create a comprehensive statistical framework that includes all productive activities within the SNA general production boundary.

The different forms of digital platform work have essential differences in their characteristics as well as policy relevance. For example, digital platform volunteer work would be work performed through or on a platform to deliver goods or services for others to consume without remuneration, while the main intention of workers engaged in digital platform employment would be to receive a profit or income. A distinction between the different forms of digital platform work is essential from a policy perspective. This is also true from a statistical point of view. Measurement of the different forms of platform work would typically require different methodologies and the use of different statistical sources.

The focus of this Handbook is on *digital platform employment*. This does not imply that the other forms of digital platform work are of lesser relevance. The measurement of, for example, digital platform volunteer work would be important to provide information on how volunteer work is provided on digital platforms, as well as for the broader measures of the size of the digital economy. Statistical sources used to measure these forms of work could also be used to measure digital platform work other than employment. This could include Time Use Surveys, volunteer work modules and other specialised surveys. However, the statistical measurement of forms of digital platform work other than employment will require further methodological work that, while important, goes beyond the scope of this Handbook.

Figure 3.4. Digital platform employment and its statistical main components



Digital platform employment

> *Digital platform employment includes all activities carried out by a person through or on a digital platform with the intention to generate pay or profit, AND:*
>
> *- the digital platform or a phone app **controls** and/or **organizes** essential aspects of the activities, such as the access to clients, the evaluation of the activities carried out, the tools needed for conducting the work, the facilitation of payments, distribution and prioritization of the work to be conducted; and*
>
> *- the work is for at least one hour in the reference period.*

Digital platform employment is independent on the type of services or goods produced by the person, as long as the activities are either carried out directly on the digital platform (e.g. in case of online web-based platforms) or through the digital platform, i.e. activities are carried out outside the digital platform but have been enabled or facilitated by the digital platform (e.g. in case of location-based platforms).

Digital platform employment is a broad concept that needs to be further decomposed in order to be able to set boundaries that contribute to conceptual clarity and effective measurement. Such a de-composition can be constructed around the *international classification of status in employment*. All work activities defined as employment are linked to a job defined as a set of tasks and duties performed (or meant to be performed) by one person for a single economic unit (ILO, 2018[13]). Depending on the type of authority and type of economic risk the worker is exposed to, jobs can be categorised in different statuses in employment according to the International Classification of Status in Employment (ICSE-18).

One dichotomy within ICSE-18 is that between independent and dependent workers. While independent workers (i.e. employers, own-account workers) own the economic unit for which they work and control its

activities, dependent workers (i.e. dependent contractors, employees, contributing family workers) do not have complete authority or control over the economic unit for which they work. While both independent and dependent workers can have a relationship to a digital platform, the situation of each type of worker – in terms of exposure to economic risk, the degree of dependency on the digital platform– would depend on the characteristics of their jobs, as reflected in their specific category of status in employment.

The relationship between the worker and the digital platform differs depending on the status in employment category of the worker involved. Independent workers, and to some extent dependent contractors, own and operate an economic unit or enterprise that is separated from the digital platform. For these workers, the digital platform is used as an external tool to provide their services or goods either to the digital platform or to the receivers of the goods and services through the digital platform. From the perspective of the digital platform, these workers would be external workers, in the sense that the digital platform does not have the responsibilities and obligations that comes with being an employer. Because of these characteristics, these workers can be considered as carrying out *external digital platform employment*.

The situation of workers carrying out external digital platform work is very different from that of workers directly engaged as employees by the digital platform to carry out work for the economic unit owning and controlling the digital platform. In these situations, the economic unit owning and controlling the digital platform has the responsibilities and authority that comes with being an employer. In this case, the worker would be covered by labour laws and social insurance according to the regulations of each country. Due to these differences, employees that carry out their work on or through the digital platform can be viewed as being in *internal digital platform employment*.

Different statuses in employment categories need to be understood broadly in relation to digital platform employment as the very notions of job and work will vary depending on the respondent. Some workers, classified as being in digital platform employment, might perceive their job as having a specific employment status. For others, the work carried out on or through the digital platform might be more sporadic, for just a few hours, or may be viewed as a hobby or as a way to earn some additional income. From a statistical point of view, however, all activities defined as employment are linked to a job. A person who spends just a few hours on an activity to earn some additional income in a given reference period would be classified as employed. If these activities are done on or through a digital platform, then this person would be within the scope of digital platform employment; depending on the status of its employment, the worker would be classified as carrying out either external or internal digital platform employment.

It is also important to stress that there is a difference between the legal status of the worker and the statistical definition of status in employment. The legal status of workers is defined by the laws and regulations of each country. The statistical categorisation of status in employment rests upon the specific characteristics of the job as defined in the International Classification of Status in Employment (ICSE-18). While the two concepts are separate, the legal status of a worker will typically influence its statistical status. When, for example, the legal status for a group of workers is changed, and they are all reclassified as employees, then it is likely that the statistical status of these same workers will also change, as the legal change would likely affect the characteristics of the jobs used to define the statistical status of workers.

External digital platform employment

A large part of digital platform employment would likely fall within the category of external digital platform employment. This would include own-account workers and dependent contractors that carry out their work on or through an external digital platform with the intention to generate pay or profit. In addition, the category could also include employers in case the independent worker who carries out the work on or through the digital platform has hired one of more employees to assist the work.

Own-account workers or independent workers without employees, as termed in ICSE-18, are workers who operate an economic unit that does not have employees on a regular basis; they may, however, have

contributing family workers assisting in the work as well as additional partners (ILO, 2018[13]). All workers in this category have sufficient control over their activities to be defined as independent workers, which distinguishes them from dependent contractors, for example. Own-account workers cover a wide range of workers in very different situations. The economic unit they own and operate might be an incorporated enterprise where the worker has committed significant financial or material resources, or the worker might be running what can best be described as a micro-enterprise, in which the worker only or mainly provides his or her labour as input. In the latter situation, the concepts of "economic unit" and "enterprise" need to be understood conceptually and not as commonly understood. Many workers that carry out digital platform employment would fall into this category.

The status in employment category of *dependent contractors* was introduced with ICSE-18. Dependent contractors are characterised as having contractual arrangements of a commercial nature to provide goods or services but being operationally or economically dependent on that unit (ILO, 2018[13]). This dependency and reduced authority over essential aspects of their activities separates them from own-account workers. Dependent contractors who carry out work on or through a digital platform are of high policy interest. They include workers who not only use the digital platform for carrying out the work, but who are also dependent on the digital platform that controls essential aspects of the work, such as access to clients, setting the price for producing the services or goods delivered, and controlling the organisation and the evaluation of the work. In addition, working methods of dependent contractors may be determined by the platforms that can in some circumstances regularly monitor their work as well. Much of the policy debate around the legal reclassification of workers in digital platform employment, and whether these should be recognised as employees or not, would typically concern this category. It would therefore be of high policy interest to statistically identify and quantify dependent contractors carrying out digital platform employment.

Employers own the economic unit in which they work and employ one or more persons to work as an employee on a regular basis. In addition, employers may have additional partners as well as contributing family workers (ILO, 2018[13]). In the case of employers, it is essential to recognise the difference between economic statistics and labour statistics. From a labour statistics point of view, digital platform employment is carried out by persons and not by economic units, which is an important distinction. An independent worker (including an employer) who owns and operates an enterprise might have a business model that categorises the enterprise as within the platform economy; however, the independent worker who runs the business would not be classified as carrying out digital platform employment if the work activities he or she conducts are not carried out through or on a digital platform. For instance, the CEO of a platform company (e.g. Uber) would be employed in the digital economy but not carry out digital platform employment. In other words, similar to own-account workers and dependent contractors, an employer can only be considered as carrying out digital platform employment if he or she carries out work directly on or through the digital platform and where the digital platform is an external agent belonging to a separate economic unit that controls the digital platform and the use of it.

Even if employers could conceptually conduct digital platform employment, the policy interest in measuring this group is more limited. From an economic statistics point of view, it is important to identify whether the economic unit owned by the employer is within the digital economy or not. However, from a labour market perspective, the relationship between employers and digital platforms would, in most cases, be a question of the business model of the enterprise owned by the employer rather than of the work characteristics of the employer. There might be exceptions to these situations, as in the case of an employer owning a micro-enterprise who engages employees to conduct work on or through an external digital platform, and where the employer also spends a significant share of his/her working time to conduct work on or through a digital platform. In these situations, the enterprise as such (even if only a micro-enterprise) would be conceptually part of the digital economy, and the employer would be considered as carrying out digital platform employment. This specific category could, if deemed relevant, be statistically identified to create a comprehensive measurement of digital platform employment.

Own-account workers and dependent contractors carrying out external digital platform employment are the core categories to measure due to the high policy interest in their situations. These workers are likely to be the largest category of digital platform employment in many countries. This category can be further decomposed into own-account workers and dependent contractors respectively, if feasible. Employers carrying out external digital platform employment would in general have less policy relevance; however, those employers who carry out a significant amount of their own work activities on or through an external digital platform could be identified as a separate category in the context of a comprehensive measurement framework.

Internal digital platform employment

Employees engaged by the digital platform (as an economic unit) would be classified by labour statistics as internal workers engaged by the platform with an agreement/contract of employment. In this case, the economic unit that owns and controls the digital platform would have the responsibilities, obligations and authority that comes with being an employer, while its employees might be effectively covered by labour laws and social insurance according to the legislation of each country. Employees engaged by the economic unit that own the digital platform can carry out a range of different activities including supporting the enterprise owing and controlling the digital platform (e.g. the programmer developing the platform) as well as carrying out work on or through the digital platform (for example a taxi driver engaged by the digital platform as an employee). In order to identify internal digital platform employment, it is therefore necessary to conceptually categorise employees engaged by the digital platform into two sub-categories:

- employees carrying out internal digital platform work, i.e. workers engaged as employees by the economic unit that own the digital platform to perform work on or through the digital platform;
- employees who are engaged by the economic unit owning the digital platform to perform without using the digital platform.

While the first group would include the taxi driver or pizza deliverer or online crowd-worker who are engaged by the digital platform as employees and who are using the digital platform as part of conducting their work, the second group would include the programmer who is hired as an employee to develop the platform as well as the accountant, human resource manager or the CEO. While these employees work directly for the economic unit owning the digital platform, their daily work activities may not necessarily be carried out through the platform. Both categories should be measured as part of economic statistics in order to calculate the productivity of the economic unit owning the digital platform; however, for digital platform employment, only the first sub-category would be of relevance.

The identification of workers engaged in internal digital platform employment would allow to quantify and track the impact of policy measures that legally re-classify workers in digital platform employment as employees. It would also allow countries to compare data across countries independently of the legal classification of these workers, to establish the working conditions for this specific group, as well as to track developments of this category relative to own-account workers and dependent contractors carrying out digital platform employment.

Supporting concepts

One particular issue with digital platform employment is that this type of work is in many countries sporadic and fragmented. For example, the COLLEEM pilot survey conducted in 14 European countries in 2017 (see Chapter 1) found that fewer than 2% of the working age population were “main platform workers”, defined as those who earn 50% or more of their income via platforms or who work more than 20 hours per week on these platforms (Pesole, 2018[14]). The sporadic nature of digital platform employment might call for introducing supporting concepts that could contribute to provide information on the prevalence of digital platform employment.

Two such complementing concepts are persons who have conducted digital platform work within a long reference period and persons who have received some income from digital platform employment. The advantage with these two supporting concepts is that they can rely on a different reference period and therefore identifies a higher number of persons who have carried out digital platform employment than in the case of using the standard definition of digital employment. As such, these concepts could be used to provide supporting information on the extent of digital platform employment within a country:

- The prevalence of external digital platform employment within a longer reference period would describe the number of workers who have conducted external digital platform employment within a longer reference period, for example within the last 12 month. This supporting concept would give an indication on the populations' overall participation in digital platform employment and can be viewed as an indication on the overall prevalence of digital platform employment among the population. This supporting concept takes into account the sporadic and fragmented character of digital platform employment, and would be particularly relevant in countries where regular digital platform employment is relatively new.
- The number of persons who have gained any income from external digital platform employment within a longer reference period would capture all persons who have gained any income from external digital platform employment within a longer reference period, for example within the last 12 months. The concept could have some advantages from a measurement perspective and would give an indication on the populations' overall participation in digital platform employment as well as the size of the income made from these activities. The supporting concept would exclude external digital platform work carried out with the intention to generate income or profit but where no profit has been made (or has not yet been received.).

Services versus goods

The distinction between producing goods or services is traditionally not a key factor for the measurement of employment. Activities for pay or profit are included independently on whether they produce goods or services. However, the distinction between services and goods has been actively used and is even directly integrated within some of the definitions used by countries and organisations. For example, the definition of platform work by Eurofound (Florisson, 2018[15]) and the definition of platform workers used by the OECD (OECD, 2019[5]) are both restricted to services only, thus excluding digital platform employment where the main purpose is selling goods. Similarly, other services such as renting out an apartment have been excluded from the OECD definition based on the argument that these activities include a low amount of labour input (OECD, 2019[5]). The reason for excluding goods and services that have a high capital investment and low labour input are two-fold; first, because the labour input is perceived to be small in relation to the provision of services; and secondly, because platforms that focus on goods are perceived to exercise less control over how the activities are organised, see (Florisson, 2018[15]).

There might well be a general difference between platforms that focus on providing services and those that mediate goods. And yet, from the perspective of labour statistics, the definition of digital platform employment centres upon whether an activity for pay or profit has taken place. Renting out an apartment through a digital platform is a good example of this. While having an apartment rented out as such is not work, and would thus not be included in either employment or in digital platform employment, the activities associated with renting out the apartment are. These would include, for example, corresponding with clients, validating bookings, cleaning the apartment between guests, handing out the keys and keeping accounts, etc. The question from the perspective of digital platform employment is therefore not so much what is produced, but rather that an activity to produce something for pay or profit has been carried out on or through a digital platform.

There may be strong policy as well as measurement reasons for why statistics should focus on service production only, for example when detailed statistics on the impact of platforms in matching labour supply

and demand are needed. In these situations, a focus on services would be meaningful and enable a more in-depth analysis of the characteristics of digital platform employment providing services. Yet by limiting the scope to digital platforms providing labour services, only a sub-part of total digital platform employment would be measured.

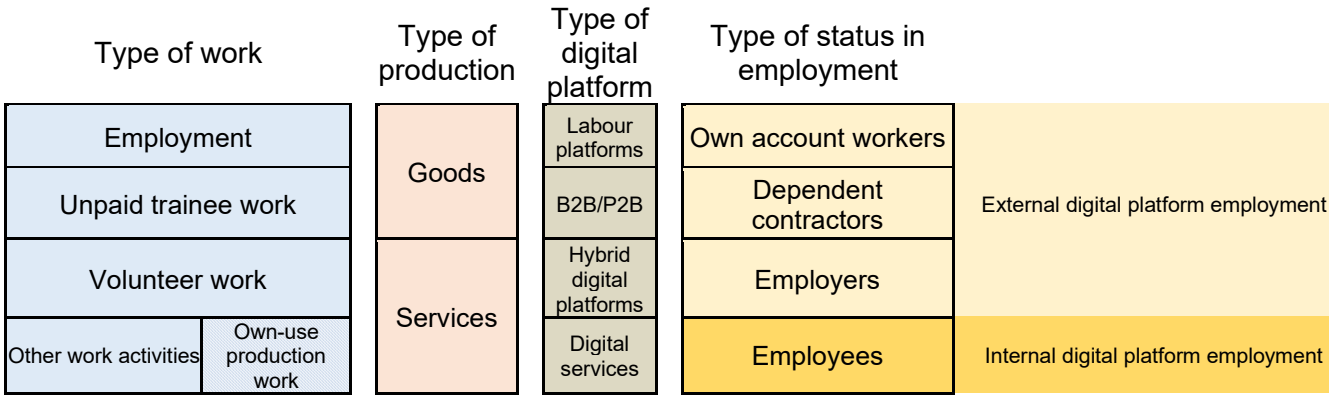
Deciding the conceptual scope

A number of different policy objectives and user needs might call for a measurement of digital platform employment. These can range from a general need to provide data on the prevalence and structure of digital platform employment in a country to the need for detailed information regarding a particular type of worker carrying out digital platform employment on or through some specific types of digital platforms. In order to meet the range of different objectives, flexibility is needed to adjust the conceptual boundaries depending on the specific area of interest. This flexibility can be achieved by assessing the relevant scope of the statistics needed for the particular objective at hand, based on four different conceptual layers.

1. **Type of work**: A starting point when deciding the most appropriate conceptual scope for statistics is the type of work that is to be measured. All forms of work can potentially be carried out on or through a digital platform, and could therefore be within the scope of digital platform work. While all the different forms of work would be of relevance to identify per se, this would require the use of different sources with adapted methodologies. From the perspective of labour statistics, the focus would naturally be on digital platform employment.
2. **Type of production**: As digital platform employment includes the production of both goods and services, a comprehensive measurement of digital platform employment would require the inclusion of both types of production. However, there might be strong policy reasons to focus measurement on the provision of services only. This reduced scope of digital platform employment would impact not only on the type of activities included in the measurement but also on the type of digital platforms included in the measurement. If limited to services only, this would imply a excluding digital platforms that mainly focus on the intermediation of goods.
3. **External/Internal digital platform employment and type of status in employment**: The current policy debate is focused on external digital platform employment, and in particular on external digital platform employment carried out by own account workers and dependent contractors. This is a core category included within the measurement framework proposed in this chapter in order to establish the prevalence of external digital platform employment among these categories of workers as well as their working conditions and characteristics. For a comprehensive measurement of external digital platform employment, the measurement can be extended to also include employers carrying out external digital platform work. The inclusion of internal digital platform employment, i.e. employees engaged by the digital platform to perform work on or through the digital platform would contribute to a comprehensive measurement of digital platform employment. Even though there might be less policy concern around this specific group, it could be important to include them in the conceptual scope in order to be establish the impact of policy measures to legally re-classify workers in digital platform employment as employees, and to allow countries to compare figures across countries independent of the legal classification of the workers carrying out digital platform employment.
4. **Type of digital platform employment (DPE)**: The different types of digital platforms could also be a target in themselves. This would for example be the case when there is a need to provide in-depth information about workers carrying out their work on or through a specific type of digital platforms, for example, workers carrying out external digital platform employment through digital labour platforms. Such a focus would impact upon the conceptual boundaries for the measurement with a reduced scope and only include a limited part of the external/internal digital platform

employment. However, there might still be strong reasons why such a reduction of the scope could be relevant taking into account the specific need of data.

Figure 3.5. Relevant layers to decide the conceptual scope



The general framework proposed in this chapter can also be applied when using the supplementing concepts of external digital platform employment within a longer reference period and of persons who have gained any income from external digital platform employment within a longer reference period. The longer reference period or/and the income approach can be used to provide supplementary measures of external digital platform employment in general as well as for targeting one specific type of production, status in employment or digital platform described in Figure 3.5. This could be of relevance for operational reasons or if there is a need to identify persons who have carried out digital platform employment for a longer period of time.

The conceptual decomposition of digital platform work and digital platform employment based on the four different layers described above creates the possibility for a comprehensive measurement of digital platform employment, and enables national statistical offices and other data producers to, depending on the particular objective and policy interest, focus on a specific part(s), relate to a more limited measurement and to the broader concept of digital platform employment. It enables countries and other data collectors to clarify the specific conceptual scope that are used within a given measurement. The greater specificity will serve to increase transparency and the understanding of the data that are produced, which in the end will increase the degree of harmonisation between countries.

In addition, the conceptual decomposition also suggests that different statistical sources might be more or less suitable to measure some specific components of digital platform employment. It is likely that a combination of statistical sources such as administrative records, labour force surveys, income and living condition surveys, Digital surveys, ICT surveys and specialised surveys will be needed in order to provide in-depth and comprehensive statistics covering all components of digital platform employment.

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4 A critical review of existing statistical sources on digital platform employment

This chapter reviews existing sources and metrics to measure digital platform employment, limited to online and location-based services mediated by digital labour platforms. The objectives of this chapter are to: i) review what measurement initiatives on digital platform employment have been undertaken so far; ii) identify the lessons learnt from these initiatives; iii) understand the pros and cons of the various statistical vehicles for answering to different policy issues. A key research question in this area has been to estimate the number of digital platform workers. Initial attempts made use of existing data sources, combined with strong assumptions. A number of surveys conducted by researchers and private agencies followed, with government agencies having sponsored some of the research. Since then, official statistical agencies of OECD Members have begun to introduce questions on digital platform workers into Labour Force Surveys (LFSs) and Internet Usage Surveys. Lastly, big data or administrative data, such as social security or tax data, have been used to estimate the number of digital platform workers.

Introduction

This chapter is a review of existing sources and metrics to measure digital platform employment, limited to online and location-based services mediated by digital labour platforms. It therefore generally excludes digital platforms whose objective is selling or renting goods and assets, unless differently specified. The measurement of internal digital platforms employment (i.e. platform workers who are engaged by the digital platform as employees) is also generally outside the scope of this review.[1]

Due to the lack of internationally agreed definition of digital platform work and employment, the terminology used in the reviewed papers is not harmonised. When discussing the findings from the reviewed sources, the current chapter reports for completeness also the original terms used, either in the main text or in footnotes. Information in the tables is also based on the original terminology.

The objective of this chapter is to: i) review what measurement initiatives on digital platform employment have been undertaken so far[2]; ii) identify the lessons learnt from these initiatives; iii) understand the pros and cons of the various statistical vehicles for answering to different policy issues.

Since the emergence of digital platform employment, there have been several attempts to estimate the number of digital platform workers. Initial attempts made use of existing data sources, combined with strong assumptions. A number of surveys conducted by both researchers and private agencies followed, with government agencies having sponsored some of the research. Since then, official statistical agencies of OECD Members have begun to introduce questions on digital platform workers into Labour Force Surveys (LFSs) and Internet Usage Surveys. Lastly, big data or administrative data, such as social security or tax data, have been used to estimate the number of digital platform workers.

The chapter looks at the attempts to measure digital platform employment by private agencies and official statistical agencies through surveys; highlights innovative uses of data; and concludes by discussing advantages and disadvantages associated with the different measurement methods.

Estimating the number of digital platform workers through surveys

Researchers have commonly used surveys to estimate the number of digital platform workers, though with wide variation in estimates. Surveys carried out by non-official organisations are presented first (summarised in Table 4.1), as chronologically have preceded surveys carried out by national statistical agencies (summarised in Table 4.2).

Non-official surveys

In the United States, (Katz and Krueger, 2016[1]) aimed to meet the lack of official statistics by conducting a version of the Bureau of Labor Statistics' (BLS) Contingent Workers Survey (CWS) and found that 0.5% of the workforce identified customers through an online intermediary[3]. In line with existing labour market statistics, the survey referred to work done in the past week, although they used a different sampling method. In contrast, the Pew Research Centre used a broader definition of digital platform worker (including those who engage in digital platform employment as a secondary job) and a longer reference period (looking at those who engaged in digital platform employment in previous 12 months) and found that 8% of US working age adults were digital platform workers (Pew Research Center, 2016[2]). Several attempts have also been made to estimate the number of digital platform workers in Europe.

For the United Kingdom, the CIPD (a representative body for British Human Resource professionals) used an online survey and concluded that 4% of British adults had engaged in digital platform employment in the past 12 months in 2016 (CIPD, 2017[3]). Despite using a broader definition (of gigs, including work found using a digital platform), a slightly lower prevalence was provided by the Royal Society for the Encouragement of Arts, Manufactures and Commerce, for the share of British adults who tried gig work

of some form, 3.1% (Balaram, Warden and Wallace-Stephens, 2017[4]). Using a definition of "gig economy" limited to including digital labour platforms only, both as main and secondary source of income, an online survey in Great Britain (Lepanjuuri K., 2018[5]) found that 4.4% of the population had "worked in the gig economy" in the 12 months previous to the survey. To correct for potential selection bias due to carrying out the survey online, the panel also included members responding by telephone. Huws et al. (2019[6]) found that 5.2% of the population in the United Kingdom had worked at least once a week for digital platforms in 2016, and that this share doubled to 9.4% in 2019.

In Germany, Bonin and Rinne (2017[7]) used a telephone survey to estimate that 2.9% of adults at some point in the past had engaged in digital platform employment. Evidence from this survey showed that respondents often misunderstand the definition of digital platform employment, and tend to classify online activities, such as job search websites, as digital platform employment. As a high number of respondents could not name the digital platform they were working for, or named platforms not related to labour platforms, the researchers corrected the share of real digital platform workers ("crowd workers") to 0.85% of adults.

In France, Le Ludec et al. (2019[8]) used a combination of three methods to estimate that about 320 000 workers (about 0.8% of the working population) are registered in digital platforms mediating offer and demand of "micro-work". The latter is a specific subset of digital platform employment, where workers are engaged to carry out "micro-tasks", i.e. small independent units of larger tasks which are to be carried out independently, often remunerated with small amounts of money (ILO, 2018[9]). The authors selected the main micro-work platforms operating in France and used the results of Digital Platform Labour (DipLab) survey to apply a specific "capture-recapture" method.[4]

Two Scandinavian surveys highlight the importance of choice of question (see Annex A2). In a telephone survey, Alsos et al., (2017[10]) found that 0.5% to 1% of Norwegian working age adults have used a digital platform (including also platforms for renting accommodation, such as AirBnb) to earn income in the past 12 months. They found that questions asked over the phone gave more accurate responses than online surveys, as does mentioning specific digital platforms. An earlier survey carried out in the country among 1,525 Norwegian adults had found higher estimates: 10% of respondents indicated they had done work for a platform at some point and 2% said they performed platform work on a weekly basis (Jesnes et al., 2016[11]). The importance of specifying whether an individual provided, or merely offered a service, is highlighted in a report for Government of Sweden, which found that although 4% of Swedish working age adults searched for work via a digital platform, only 2.5% were successful (SOU, 2017[12]).

There have been several cross-country studies of digital platform workers. McKinsey Global Institute conducted an online survey of 8 000 workers across six countries (the United States, the United Kingdom, Germany, Sweden, France, and Spain) and found approximately 1.5% of respondents have earned income via digital labour platforms in the pooled sample (Manyika et al., 2016[13]).

Huws et al. (2019[6]) estimated the share of digital platform workers based on online surveys carried out in 13 European countries[5] between 2016 and 2019, either as an addition to an existing omnibus survey or as a stand-alone survey. Data collected through samples of about 2 000 respondents in each country led to estimates of the number of regular (at least weekly) digital platform workers ranging from 4.9% of the working population in Sweden and the Netherlands in 2016 to 28.5% in the Czech Republic in 2019. However, differences in the age ranges in the samples limit cross-country comparability of this study. Estimates of the prevalence of digital platform employment from this survey are higher than those found in other surveys. This may derive from selection bias and overrepresentation of online workers among the respondents, particularly those used to perform micro-task work, such as filling online surveys. In addition, the effect of paying the respondents to answer the survey may add a bias. To assess potential selection biases in online surveys, the authors carried out companion offline surveys in two countries: a face-to-face survey in the United Kingdom and a telephone survey in Switzerland. Although the two UK surveys returned similar results, those carried out in Switzerland by telephone yielded lower estimates of digital

platform workers (1.6% of total population aged 15 to 89 years) than those measured through the online survey by the authors.

In Europe, cross-country surveys have been undertaken by Eurobarometer and the European Commission. A Eurobarometer poll estimates the number of adults who provided a service using a digital platform in 2016 (and updated in 2018), including digital labour platforms, car sharing and digital platforms to rent accommodation. This survey highlighted wide variation across countries in the number of workers having offered their services through a digital platform at least once, ranging from 16% in France to less than 1% in Malta in 2016.[6] The study also highlighted the importance of choosing an appropriate reference time, as those who regularly supply a service are a small fraction of those who do so occasionally (Eurobarometer, 2016[14]; Eurobarometer, 2018[15]).

Findings from the European Commission's Joint Research Centre Collaborative Economy and Employment (COLLEEM) pilot survey conducted in 2017 in 14 EU Member States and repeated in 2018 across 16 EU Member States[7] (both fielded by the Public Policy and Management Institute) are described in Chapter 1 of this Handbook. According to COLLEEM, the share of adults who provided services via online platforms monthly (digital labour platforms only) was 11% in the 16 countries surveyed in 2018, slightly higher than in 2017 (9.5%). Estimates from COLLEEM are affected by some methodological limits. The survey was conducted online among frequent Internet users, thus leading to potential self-selection bias, particularly of those providing professional services online. Potential self-selection bias was corrected for by using weights for education, employment status, and frequency of Internet use (based on Eurostat's LFS and ICT survey) when reporting results for the adult population as a whole. However, bias in this survey may remain (Pesole et al., 2018[16]); (Urzì Brancati, Pesole and Fernández-Macías, 2020[17]); (Piasna and Drahokoupil, 2019[18]).

To overcome potential biases of paid, opt-in online surveys, Piasna and Drahokoupil (2019[18]), collected data on digital platform workers in five central and eastern European countries (Bulgaria, Hungary, Latvia, Poland and Slovakia) through the ETUI Internet and Platform Work Survey, using stratified random sampling of the entire population and face-to-face interviews. The respondents were not remunerated for their participation in the survey. Based on more than 4 700 respondents, they found that a lower share of adults engaged in monthly digital platform employment[8] than previous estimates, with proportion of 0.4% in Poland, 0.8% in Latvia,1.1% in Slovakia, 1.% in Bulgaria and 3% in Hungary. More regular digital platform employment (at least weekly) ranges from 0.4% in Poland and Slovakia and 0.5% in Latvia, to 0.8% in Bulgaria and 1.9% in Hungary.

The reviewed studies show the importance of choice of the survey mode and its impact on survey's results (Box 4.1). These considerations are also applicable to surveys carried out by official organisations.

Box 4.1. Observations on survey mode

Evidence shows that even with very similar definitions, survey results can vary rather substantially when data are collected face-to-face, online or by telephone. This can be attributed to factors related to coverage (which may introduce sampling biases), and to respondents' behaviour (which may introduce measurement biases).

Different survey modes vary in their capability of covering relevant target groups

Although it could be argued that an online survey is an appropriate tool to target platform workers, as they need to have Internet access due to the nature of this employment form, there is some indication that online platform workers are better represented in online surveys than on-location platform workers who realise their tasks in the physical sphere. Furthermore, these respondents are likely to be more familiar with digital platforms than those members of the target population that have no Internet. Results may therefore be not representative of the general population. Adjusting the sample distribution through quotas or (post-stratification) weighting cannot correct for this bias, unless Internet access is provided to respondents as part of the survey design (Eurofound, 2019[19]).

Telephone surveys are not only limited to people who have a phone, but this number also needs to be recorded in an official register. It is likely that some population groups tend to register less than others. This could for example result in a situation in which platform workers with migration background or highly specialised online platform workers are less well covered in a survey. Related to that, national registers of mobile phones might turn out to be problematic as nowadays there not necessarily is a direct link anymore between the phone suffix for a certain country and the respondents' actual place of living and working. This, again, might result in biased results as regards, for example, migrants or higher-educated (cross-border) mobile workers who (also) engage in platform work.

While the previously raised concerns (Eurofound, 2019[19]) as regards certain population groups (such as the institutionalised) being excluded from face-to-face surveys might be less relevant for digital platform employment surveys, at the time of writing (mid-2021) it remains to be seen whether and how the 'new normal' after the COVID-19 pandemic affects face-to-face surveys. It can, for example, be expected that people affected by ill health remain cautious in the medium or even long run as regards allowing interviewers to their private home where physical distancing might be difficult to realise. This can result in sample bias as for some people their health situation is a motivation to engage in online platform work, and they might be structurally omitted.

Other groups of digital platform workers might be difficult to cover in face-to-face household surveys as they are difficult to reach at home. Examples are on-location digital platform workers who, for example, do food delivery or ride-hailing in the evening or on weekends to generate additional income to a full-time employment during core working hours on weekdays.

Measurement orientation and expected bias should be considered when deciding upon the survey mode

It is generally argued that self-administered survey modes (like online surveys) encourage respondents to provide more honest answers compared to interviewer-guided survey modes like face-to-face or phone. There is no reason to assume that this is different for digital platform employment surveys. However, the big advantage of interviewer-guided survey modes is that the interviewer can clarify questions and probe in case of inconsistent answer behaviour of the respondent. Given the challenge of demarcation of the concept of digital platform employment, this might result in better survey quality.

The survey mode also influences the length of the survey. In face-to-face surveys, more questions can be asked than in online surveys (which are widely recommended to be limited to a maximum of 15

minutes). Accordingly, if a more comprehensive or in-depth coverage of topics is the intention of the survey, face-to-face is the better option compared to an online survey.

Related to that, response behaviour might differ between online surveys filled on a PC or laptop compared to on a mobile phone. Attention spans on the latter might be shorter, open-ended questions even less answered and longer answer batteries or unfavourable designs might trigger higher non-response and break-up rates which influence the survey quality. This may be even more so in the case of on-location digital platform workers who might use waiting times between assignments to fill questionnaires on the app, but then interrupt or even stop fully if they receive an order on short-notice.

Surveys also provide information on the working conditions of digital platform workers

Beyond estimating the prevalence of digital platform workers, (Urzì Brancati, Pesole and Fernández-Macías, 2020[17]) also included questions aimed at better understanding their working conditions. There is a growing body of literature focusing on specific aspects of digital platform employment, such as legal work arrangements. While these studies do not provide information on the size of digital platform employment, they could allow improving questions in surveys administered for measurement purposes.

ILO (2018[9]) provides one of the first comparative studies of working conditions of micro-task workers around the world. It is based on an ILO survey covering 3 500 workers in 75 countries and working on five major globally operating micro-task platforms. This was supplemented with in-depth, follow-up interviews with a random sample of workers. The report analyses the working conditions on these micro-task platforms, including pay rates, work availability and intensity, social protection coverage and work–life balance. Drawing on surveys and interviews with about 12 000 workers and representatives of 85 businesses, ILO (2021[20]) examines working conditions, patterns of work and income, access to social protection, association and collective bargaining rights of digital platform workers operating in online web-based and location-based platforms around the world.

In Belgium, the food delivery platform Deliveroo employed workers through an intermediary company in 2016-2018 (SMart). Based on the administrative data provided by SMart, Drahokoupil and Piasna (2019[21]) analysed data on riders active from September 2016 to April 2017 and administered a survey to these riders. They analysed workers' characteristics, patterns of work and pay, motivation for engaging in digital platform employment, as well as their perceived benefits and disadvantages of cessation of the Deliveroo-SMart contractual agreement.

Table 4.1. Main features of non-official surveys measuring digital platform employment

Country	Time when the survey was conducted	Reference period	Reference	Type(s) of digital platform in scope	Question wording	Selection into sample	Sample size	Survey method	Definition of digital platform employment provided?	Examples of digital platform named?	Reference to earned income?	Estimate of the prevalence of digital platform employment (%)
Norway	Sept. 2016 to Oct. 2017	In the past 12 months	(Alsos et al., 2017[10])	Digital labour platforms and digital platforms for assets rental (AirBnb)	Done any assignments or paid employment through companies that use apps and websites to convey work and services	Working age population	Survey of work providers: 1 000 respondents	Pilot surveys were online, actual survey was via telephone		Yes		0.5% of working age population
Great Britain	11 Nov. 2016 to 10 Jan. 2017	Ever	(Balaram, Warden and Wallace-Stephens, 2017[4])	Digital labour platforms	Personally carried out paid work using a website or mobile phone application	Residents aged 15 and up	7 656 respondents	Face-to-face		Yes	Yes	3.2% of respondents have previously carried out gig work, 2.2% currently do
Italy, the United States, and the United Kingdom	ITA: 8-15 May 2018 GBR: 5 Feb. and 2 Mar. 2018 USA: 24-27 Apr. 2017	Last year? (Unknown)	(Boeri et al., 2018[22])	"Gig economy" (Digital labour platforms and digital platforms for assets rental, i.e. AirBnB)	Jobs organised via online platforms	Working age population (the US survey sampled using online ads and social media)	15 000 for Italy and 20 000 for the United Kingdom, and 10 368 for the United States	Online				2.6% in Italy, 3.0% for the United Kingdom. No estimate for the US
Germany		Ever	(Bonin and Rinne,	Digital labour platforms	Performing paid work		10 000 interviews	Telephone	No	No	Yes	3.1% currently, an additional

Country	Time when the survey was conducted	Reference period	Reference	Type(s) of digital platform in scope	Question wording	Selection into sample	Sample size	Survey method	Definition of digital platform employment provided?	Examples of digital platform named?	Reference to earned income?	Estimate of the prevalence of digital platform employment (%)
			2017[7])		assignments obtained via platforms or apps							2.9% had previously
United Kingdom	2 to 15 Dec. 2016	In the last 12 months	(CIPD, 2017[3])	Digital labour platforms, digital platforms for selling goods and digital platform for renting assets	Individuals who have used an online platform at least once to: 1) provide transport, 2) rent their own vehicle, 3) deliver food or goods, 4) perform short-term jobs, or 5) do other work	A nationally representative sample of UK adults aged 18 to 70.	5 019 respondents	Online	No	Yes	Yes	4% of employed adults
14 EU countries: GBR, ESP, DEU, NLD, PRT, ITA, LTU, ROM, FRA, SWE, HUN, HRV, SVK, FIN	Second half of June 2017	Ever	COLLEEM (Pesole et al., 2018[16])	Digital labour platforms	Individuals providing services via online platforms where either 1) both work and payment is digital, or 2) payment is digital but the work is performed on-location.	Internet users aged 16 to 74	32 389 observations (approximately 2 300 per country)	Online	Yes	Yes	Yes	On average 9.7% of the adult population ever provided labour to an online platform

Country	Time when the survey was conducted	Reference period	Reference	Type(s) of digital platform in scope	Question wording	Selection into sample	Sample size	Survey method	Definition of digital platform employment provided?	Examples of digital platform named?	Reference to earned income?	Estimate of the prevalence of digital platform employment (%)
16 EU countries: CZE, GBR, ESP, DEU, NLD, PRT, IRL, ITA, LTU, ROM, FRA, SWE,HUN, HRV, SVK, FIN	Sept. and Nov. 2018	Ever	COLLEEM II (Urzì Brancati, Pesole and Fernández-Macías, 2020[17])	Digital labour platforms	See COLLEEM		38 878 observations	Online	Yes	Yes	Yes	On average 11% of the adult population ever provided labour to an online platform
EU-28 countries	March 2016	Ever	(Eurobarometer, 2018[15])	"Collaborative platform" (Digital labour platforms and other digital services platforms)	Provided services on collaborative platforms. A collaborative platform is an internet based tool that enables transactions between people providing and using a service	Residents aged 15 years and over	Around 500 interviews per country	Telephone interview	Yes	No	No	32% of respondents have visited collaborative platforms, of which another 32% have offered services
United Kingdom, Sweden, Germany, Austria, and the Netherlands	GBR (Jan. 2016) SWE (Mar. 2016) AUS DEU NLD (Apr. 2016)	Unknown	(Huws, Spencer and Joyce, 2016[23])	Digital labour platforms	Engaged in paid work organised via an online platform	Respondents to Ipsos-MORI iOmnibus online survey Working age	GBR-2 238 SWE-2 146 AUS-1 969 DEU-2 180 NLD-2 126	Online	No			Between 9 and 19% of respondents engaged in crowd work

Country	Time when the survey was conducted	Reference period	Reference	Type(s) of digital platform in scope	Question wording	Selection into sample	Sample size	Survey method	Definition of digital platform employment provided?	Examples of digital platform named?	Reference to earned income?	Estimate of the prevalence of digital platform employment (%)
						population (age ranges between 16-65 and 16-75)						
13 EU countries: GBR, SWE, NLD, DEU, AUT, CHE, ITA, EST, FIN, ESP, SVN, CZE, FRA	2016 to 2019	At least weekly / monthly	(Huws et al., 2019[6])	Digital labour platforms	Engaged in paid work organised via an online platform	Respondents to Ipsos-MORI iOmnibus online survey Working age population (age ranges between 18-55 and 16-75)	GBR-2 235 SWE-2 146 AUT-1 969 DEU-2 180 NLD-2 125 CHE-2 001 ITA-2 199 EST-2 000 FIN-2 000 ESP-2 182 SVN-2 001 CZE-2 000 FRA-2 159	Online	No	No	Yes	Between 9% (NLD, 2016) and 44% (CZE, 2019) of respondents engaged in crowd work
United States, Germany, France, Sweden, Spain	June and July 2016	In the past 12 months	(Manyika et al., 2016[13])	Digital labour platforms, digital platforms for selling goods and digital platform for renting assets	Classified independent workers according to a decision tree.	Working age respondents	8 131 responses (minimum 1 200 responses per country)	Administered electronically				1.5%
United Kingdom	6 July to 6 August 2017	In the past 12 months	(Lepanjuuri K., 2018[5])	Digital labour platforms	Gig economy (involves exchange of labour for money between	All GB adults (aged 18+)	NatCen Panel (2 184 interviews) + YouGov Omnibus non-probability	Online	Yes	Yes	Yes	4.4% of the surveyed population (including Amazon Mechanical

Country	Time when the survey was conducted	Reference period	Reference	Type(s) of digital platform in scope	Question wording	Selection into sample	Sample size	Survey method	Definition of digital platform employment provided?	Examples of digital platform named?	Reference to earned income?	Estimate of the prevalence of digital platform employment (%)
					individuals or companies via digital platforms that actively facilitate matching between providers and customers, on a short-term and payment by task basis)		online panel (11 354 people surveyed)					Turk, CrowdFlower, Clickworker, Microworkers and Prolific) worked via platforms during the previous 12 months
France	Website of the platforms visited in Sept. 2018	Unknown	(Le Ludec, Tubaro and Casilli, 2019[8])	Digital labour platforms	Estimates of the individuals micro-working in France, based on the results of the survey "Digital Platform Labour" (DiPLab).	Estimates are based on a selection of seven micro-working platforms operating in France. The authors use a combination of 3 methods (declaration, capture-recapture, panel), adjusted by taking into account the multi-homing (multi-activity of micro-workers on multiple platforms) to estimate the number of micro-workers in France. This is also combined with a distributed questionnaire in the form of a paid task (997 responses obtained).			Yes	Yes	No	The estimated number of French people registered for micro-work platforms on the seven platforms is nearing 320 000. Among them, 4.7% are micro-working at least once a week, and 16.4% less than once a month.
United States	12 July to 8 August 2016	In the past year	(Pew Research Center, 2016[2])	Digital labour platforms	Earned money by taking jobs (including filling	Respondents of the American Trends Panel who	4 579 respondents (4 165 online, 414 via mail)	Online and via mail	Yes	Yes	Yes	8% of all adults engaged in gig work

Country	Time when the survey was conducted	Reference period	Reference	Type(s) of digital platform in scope	Question wording	Selection into sample	Sample size	Survey method	Definition of digital platform employment provided?	Examples of digital platform named?	Reference to earned income?	Estimate of the prevalence of digital platform employment (%)
					surveys) through a website that required a user profile	self-identify as internet users.						
Sweden	Autumn 2016	In the past 12 months	(SOU, 2017[12])	Digital labour platforms	Attempted to get a job through an online platform	Aged 16-64	7 069 respondents	Web panel, recruited by telephone	Yes	Yes	Yes	Around 4% have been trying, while around 2.5% of working age population has been successful

Source: Adapted from OECD (2019[24]), Measuring platform mediated workers, OECD Digital Economy Papers No.282, OECD Publishing, https://doi.org/10.1787/170a14d9-en.

Surveys of national statistical offices

Labour force surveys

Existing labour statistics, such as those produced by LFSs, have difficulties in tracking digital platform workers. Such surveys focus on a worker's primary job and can be unreliable in their coverage of secondary jobs and self-employment, and do not capture the diversity of employment contracts (Bernhardt and Thomason, 2017[25]); (Abraham et al., 2018[26]). This causes difficulties if digital platform workers already have a stable job and use digital platform employment to complement their income. Therefore, it is necessary to develop new questions for surveys. Recently, questions have been included in LFSs in Canada, Denmark, Finland, Singapore, Switzerland and the United States (Table 4.2). Italy also included a specific module on "gig workers" in its LFS in 2021 (ISTAT, 2021[27]).

In the United States, the Bureau of Labor Statistics (BLS) reinstated in 2017 the Contingent Work Survey (CWS) – a supplement to the nation's monthly LFS -, which had been discontinued in 2005. In 2017, the BLS introduced two new questions on "electronically-mediated work", with a view of measuring participation in the platform economy. The interviews were conducted by telephone and used a 'last week' reference period. While 3.3% of respondents (out of 46 000 people interviewed) answered positively to the situations described as electronically-mediated work, a number of false positive answers were detected and in the recoded data; overall, only 1% the workforce was classified as working through an online intermediary.

Finland introduced in 2017 a question in the LFS to estimate the number of people aged 15 to 74 who had earned an income through digital platforms in the previous year (Finland, 2017[28]). Results from about 43 000 respondents showed that 0.3% of adults had earned more than 25% of their income from digital platforms. The question refers to a limited number of specific digital platforms, including some non-labour digital platforms, such as AirBnb and national digital platforms for selling second-hand goods. Pilot tests before the running of the survey had shown that respondents lacked understanding of what should be considered within the scope of digital platform employment and income (Sutela, 2018[29]).

Denmark also included specific examples of digital labour platforms and digital platforms for renting accommodation in three questions on digital platforms added to the 2017 LFS. The large-scale survey involved 18 000 randomly selected Danish citizens aged 15–74 years, interviewed using a combination of web survey and phone interviews. The survey concluded that only 1% of the workforce had earned income from platform mediated work in the last 12 months (Ilsøe and Larsen, 2020[30]).

The specific module on "Internet-mediated platform work" added to the 2019 LFS in Switzerland (Swiss Federal Statistical Office (SFSO), 2020[31]) also showed the importance of addressing cognitive biases when formulating the questions. Implementation of this module showed that plausibility checks are very important; these checks were based on hours worked, income, named platforms and interviewer's additional comments, in order to control for false positive. Results from about 11 500 respondents showed that 1.6% of the population aged 15 to 89 provide platform services in Switzerland including renting out accommodation and sale of goods (without these two, digital platform employment amounts to 0.4% of total population).

As an annual supplement to its LFS, Singapore also included questions to capture the prevalence of own account workers who engaged in digital platform employment. This referred to digital platforms that serve as intermediaries to connect buyers with workers who take up piecemeal or assignment-based work. Results showed that in 2020, 3.6% of the workforce were regular own account workers who took up work via online matching platforms, either as their main job or on the side, over a one-year reference period. With the growth of ride-hailing and item delivery apps, most of the workers who utilised such digital platforms were providing services related to the transportation of goods and passengers.

ICT Surveys

Several national statistical offices of OECD Member States have conducted pilot surveys to measure the number of consumers and workers using digital labour platforms (Table 4.2). Initial attempts focused on use of digital platforms by consumers and were included in ICT usage surveys (such as those of Eurostat). More recently, questions asking whether participants have engaged in digital platform employment have been included in Internet use surveys in Canada, the United States, and in an EU-wide survey ran in 2018 and 2019. While the available estimates are not comparable across countries, they show a variety of approaches to dealing with the issues of providing definitions to questionnaire respondents, and setting appropriate reference periods. In addition to cross-country differences, there are also substantial differences with surveys done by private organisations (see above). Some of the differences in estimates of platform use are due to differences in methodologies and definitions between countries and over time.

The Canada Internet Use Survey included a detailed module on online work in 2018 and in 2020. The 2018 results show that, among Internet users, 8% use Internet to earn income. Among them, 14.1% earned income using online freelancing, and 6.1% through platform-based peer-to-peer services.

The US Computer and Internet Use Supplement (CIUS), which is compiled as a supplement to the CPS, includes a question on online work, asking about own services offered for sale via the Internet. Estimates referring to November 2019 show a prevalence of 7.6% among Internet users, up from 6% in November 2017.

Eurostat inserted two questions in the Community Survey on ICT Usage in Households and by Individuals in 2018 and 2019. At the European level, results were not published as considered not reliable due to the small sample size and to limited respondents' understanding of the concept of digital platform employment. However, Slovenia and Switzerland published some results, which confirm that only a tiny share of the population obtained paid work by using an intermediary website or apps. For example, in 2019, the share was 2.1% in Switzerland (among individuals aged 15 and more) and 0.5% in Slovenia 2019 (among individuals aged 16 to 74). An accurate measurement of digital platform employment through the ICT survey would require a small ad-hoc module with several questions, so that respondents can have an appropriate understanding. The Eurostat ICT survey currently does not have this space, as it is aimed of surveying a number of other topics. Furthermore, estimates show that a small number of digital platform workers are likely to be included in each sample, making it difficult to gain high-quality statistics of digital platform workers via this type of official survey.

Other surveys

In Australia, (McDonald et al., 2019[32]) carried out for the Victorian government an online survey of more than 14 000 adults to enquire about the extent and nature of digital platform employment[9] across the country. The survey found that 7.1% of survey respondents worked through a digital platform or had done so in the previous year.[10] Based on the findings from the survey, the Victorian government released a report on the "on-demand workforce" – of which platform work is considered a subset – (The State of Victoria, 2020[33]) highlighting digital platform workers' conditions and offering recommendations for improvement.

In France, the National Institute for Statistics INSEE (Richet Damien, 2020[34]) surveyed individual entrepreneurs who had newly registered as "micro-entrepreneurs" in 2018. The Information system on new enterprises-survey of micro-entrepreneurs (*Système d'information sur les nouvelles entreprises (Sine) – enquête Micro-entrepreneurs*) allows to survey at regular intervals 56 000 new micro-entrepreneurs in France, to follow the developments for a new generation of enterprises. The survey found that one in six (16%) of them worked via a digital platform, with this percentage as high as two-thirds for micro-entrepreneurs in the transport sector. About one-third of new micro-entrepreneurs working through a digital platform – more than half of those in the transport sector – declared having created the enterprise

specifically to this end. The Information system on new enterprises-survey (Sine) still asks this question in the following surveys (2019, 2021, 2022) and extended the scope, not only aiming at “micro-entrepreneurs” but also all newly created enterprises.

In Italy, the National Institute of Public Policy Analysis Innovation (INAPP), added a module on the gig economy to its 2018 survey (Participation, Labour, Unemployment, Survey, INAPP-PLUS). The survey, covering 45 000 adults and administered by telephone, found that 0.45% of Italians (about 213 000 people) offered services through labour-mediating digital platforms in the year before the survey (Cirillo, Guarascio and Scicchitano, 2019[35]). An earlier web-based survey, based on a sample of 15 000 respondents, estimated that a higher share of the population engaged in digital platform employment[11] (2.6% of the working population) (Boeri et al., 2018[22]), although it used a different reference period (the week before the survey).

Other official agencies have considered digital platform workers as a subset of the broader category of “informal workers”. In the United States, the Federal Reserve's 2019 Survey of Household Economics and Decision-making (SHED), included a section on Gig Economy, including childcare, house cleaning and ride sharing. The survey – which counted on over 12 200 responses from a representative sample of the adult population – found that overall 17% of adults engaged in some form of gig work in the previous month, although only 13% of them found customers and received payments through an app or digital platform (Board, 2020[36]). In Canada, a study based on the Bank of Canada’s Canadian Survey of Consumer Expectations (Kostyshyna and Luu, 2019[37]) estimated that 18% of respondents had carried out informal work, with about 35% of them using websites and/or mobile platforms in the course of doing this work. However, the small sample limited the representativeness of this study (Sung-Hee, Liu and Ostrovsky, 2019[38]).

Lessons learnt from official surveys

Different approaches used to help respondents understand digital platform employment

When asking whether a person is a digital platform worker it is necessary that respondents have the same understanding of digital platform employment, and that the definition captures the wide variety of activities that can be done through digital platforms, while setting the boundaries with those that should not be considered within it. The United Kingdom’s ONS explicitly referred to finding work on a ‘digital platform’ in its pilot survey, but many respondents poorly understood the term. Other statistical agencies have taken the approach of providing a definition of digital platform employment, giving examples of digital platforms, or restricting their questions to a narrow range of digital platforms, such as ride-hailing (Annex 4.A). In addition, both the ordering of questions and use of probing questions can affect results (Abraham and Amaya, 2018[39]).

Both the US Bureau of Labor Statistics (in the 2017 CWS) and McDonald et al. (2019[32]) (in the survey carried out in Australia) included a detailed description of digital platform employment. While such detailed description is appropriate for an occasional survey focusing specifically on contingent workers, it is likely to be cumbersome if included in a regular survey, such as monthly or quarterly LFSs.

Although the CWS does not explicitly mention digital platforms, its question refers to finding work (performed in-person) “through companies that connect [workers] directly with customers using a website or mobile app”. Therefore, the description is robust to whether or not respondents consider themselves to be self-employed or an employee of the platform. In addition, the description states that the app or website coordinates payment for the service. The description aims to reduce the possibility that respondents, when answering this question, could include capital-intensive services (such as providing accommodation) by referring to “short tasks or jobs”, although respondents may differ in their understanding of what is considered a short duration of time, and may exclude freelancing. Finally, the CWS description gives the example of providing transport, household chores or online work, but does not refer to specific digital

platforms. However, many respondents poorly understood the definition, answering “yes” even if they merely made use of a computer or mobile app in their job. After recoding the data (e.g. by removing obviously incorrect responses, including hairstylists that said they worked entirely online), the estimated number of digital platform workers was reduced from 3.3% to 1% (Bureau of Labor Statistics, 2018[40]).

Far shorter questions have been included in other surveys, such as the LFS of Denmark, though it is questionable whether they convey to respondents a clear understanding of digital platform employment. The Danish survey asks whether respondents earned money by “performing work done through websites or apps” (Ilsøe and Madsen, 2017[41]). In the 2018 Eurostat ICT Usage in Households and by Individuals Survey, Eurostat referred to “intermediary” websites or apps. However, it is questionable whether all respondents would have the same understanding of the term intermediary. Although Eurostat does not say the work must be performed through the app or website, the survey explicitly excludes employment agencies. However, robustness checks (such as asking participants to name the digital platform which they work with) have shown that respondents poorly understood the question, which led Eurostat to decide not to publish the results.

Several surveys offer greater clarity by asking separate questions for digital platforms offering goods and services and for those mediating labour. The Canadian Internet Use Survey mentions six categories of digital platforms from which respondents can choose. The US Federal Reserve’s Survey of Households Economics and Decision-making (SHED) similarly offers six categories of activities. While the category “driving or ride-sharing” also mentions examples of digital platforms mediating this job, for the category “other paid personal tasks, such as deliveries” it is ambiguous whether a respondent would include services mediated by a digital platform. Likewise, a respondent may not include physically delivered services, such as handiwork, within the category “paid tasks online”. The Swiss LFS in 2019 had four filter questions for respondents to choose between renting out accommodation, providing taxi services, selling goods, or providing other services. The Danish LFS asks a separate question to those who earned money ‘performing work’ and those who rented property, while the Canadian LFS refers specifically to ride services and private accommodation services (to the exclusion of all other digital platforms). Both the United States CIUS Supplement and Statistics Finland do not distinguish between digital platforms renting accommodation and those mediating labour.

As discussed in Chapter 2, a number of different policy objectives and user needs might call for measurement of digital platform work and employment. In order to meet the range of different objectives, flexibility is needed to adjust the conceptual boundaries depending on the specific area of interest.

Most official surveys name specific examples of digital platforms to aid respondents understand what digital platforms are. The most common example of a digital platform mentioned by LFS is Uber, which is mentioned by the Canadian, Danish, Finnish and Swiss surveys. Among the surveys that do not offer an example, the French LFS combines both platforms and businesses that direct customers to the worker (“intermediary”, including digital platforms) (Insee, 2018[42]) while the US Bureau of Labor Statistics offers a detailed description.

Cross-country comparability requires consistent question wording, concepts and reference periods

There are also several minor differences in question wording between surveys; experience from Sweden’s State Public Reports (SOU) suggests that this can have a large effect on the estimated number of digital platform workers (SOU, 2017[12]). These include asking if the respondent offered, or provided, a service; whether the question is broad enough to include those who engage in occasional digital platform employment for secondary income; and the chosen reference period.

Almost all surveys ask whether the worker provided a service, implying the worker completed a commercial transaction. However, the US CIUS asks whether a service was offered for sale (rather than provided),

without specifying whether a transaction was completed or not. Similarly, the Canadian LFS asks whether the respondent 'offered' a service (and not necessarily 'provided' it) and does not mention the earning of income, meaning the survey could include those who offered a service for charitable reasons, and did not complete a commercial transaction.

Labour force statistics have traditionally focused on a worker's main job. However, digital platform employment offers workers the flexibility to earn additional income, without becoming the respondent's 'main job'. Only the French LFS excludes those who engage in digital platform employment as a secondary job (by means of a series of filter questions). In contrast the US Fed only include secondary income, while the US Bureau of Labour Statistics, the 2018 Canadian Internet Use Survey, and the 2018 Eurostat ICT Usage Survey asks the respondent to specify whether the work done was as a workers main job, or to gain additional income. Likewise, the Swiss LFS ad-hoc module asks to specify whether the service provided was as part of the main, second or an additional job.

A related problem in comparing estimates of the number of digital platform workers with other categories of employment is the reference period used. LFSs typically ask for a respondent employment status in the past reference week. However, only the Bureau of Labor Statistics (CWS) asks whether the respondent performed digital platform employment in the last week. In contrast, surveys such as the Canadian, Danish, and Finnish LFSs refer to the past 12 months. The use of a longer reference period can greatly increase the estimated number of digital platform workers. Using a longer reference period also increases the share of occasional digital platform workers among all digital platform workers. Therefore, asking whether a respondent engaged in digital platform employment in the past 12 months as filter question, and then whether they engaged in digital platform employment in the past week can ensure comparability with the LFS employment count, and capture the larger number of irregular digital platform workers. This approach is taken in the Swiss LFS ad-hoc module. However, it can also be argued that the number of hours is more relevant than the frequency someone works on a digital platform (Pesole et al., 2018[16]).

Table 4.2. Main features of official surveys measuring digital platform employment

Country	Time when the survey was conducted	Reference period	Name of the survey	Type(s) of digital platform in scope[1]	Question wording	Sample size	Definition of digital platform employment provided?	Examples of digital platforms named?	Reference to earned income?	Estimates of the prevalence of digital platform employment (%)
Australia	21 Mar. to 21 Apr. 2019	In the past 12 months / ever (before the 12 past months)	Digital Platform Work in Australia - Prevalence, Nature and Impact	Digital labour platforms, digital platforms for selling goods and digital platform for renting assets	Earning income through digital platforms; renting, leasing, selling or licensing through platforms	Approximately 15 000 individuals	Yes	Yes	Yes	7.1% currently or in the last 12 months have earned an income working or offering services through a platform, and 6% previous the last 12 months
Canada	Nov. 2015 to Oct. 2016	In the past 12 months	LFS Fast Track Module –October 2016 collection	Digital labour platforms (location-based)[2]	Offered ride services	Approximately 100 000 individuals	No	Yes	No	0.2% (P2P Ride services only)
Canada	2018	In the past 12 months	Canada Internet Use survey	Digital labour platforms, digital platforms for selling goods and digital platform for renting assets	Provided platform-based peer-to-peer services or online freelancing	Approximately 26 000 individuals	No	Yes	Yes	8% of prevalence of Internet use to earn income Among income earners using Internet: 6.1% via platform-based peer-to-peer services and 14.1% via online freelancing
Canada	2018 (Regular CSCE questions and special questions included in the CSCE from 2018 Q2 to 2018 Q4)	Unknown	The Size and Characteristics Informal ("Gig") Work in Canada	Digital labour platforms	The question refers to "informal work", not to "platform work", and provides a list of activities	2 000 individuals Canadian Survey of Consumer Expectations (CSCE), from the Bank of Canada	No	Yes	Yes	Informal work as a share of the labour force is 3.5% (measured in full-time equivalents, average 2018Q3–2018Q4). About 35% of respondents engaging in informal activities used websites and/or mobile platforms in the course of doing this work
Denmark	Jan. 2017 to Mar. 2017	In the past 12 months	Denmark's Labour Force Survey	Digital labour platforms[3]	Performed work through websites or apps (e.g.	Representative sample of 18 000 Danes	No	Yes	Yes	1.0% (have earned money by performing work found through websites or apps).

Country	Time when the survey was conducted	Reference period	Name of the survey	Type(s) of digital platform in scope[1]	Question wording	Sample size	Definition of digital platform employment provided?	Examples of digital platforms named?	Reference to earned income?	Estimates of the prevalence of digital platform employment (%)
					Uber)					
EU Member states	2018 and 2019	In the last 12 month	Eurostat Community Survey on ICT Usage and e-commerce in Households and by Individuals	Digital labour platforms	Obtained paid work by using an intermediary website or apps		No	Yes	Yes	Results have not been published due to lack of reliability
Finland	During the year 2017	In the past 12 months	Finland's Labour Force Survey 2017	Digital labour platforms, digital platforms for selling goods and digital platform for renting assets	Earned income through capital or labour platforms	12 000 persons every month. Sub-sample for platform jobs was 43 000 persons	No	Yes	Yes	7% (have earned income through capital or labour platforms)
France	During the year 2017	In the reference week	Ad-Hoc module of the European LFS (6th wave sample)	"Intermediaries" (it includes digital platforms without specifications)	Self-employed in main job that contact clients through a platform or a third party business	3 700 independents (sample of the 6th wave of the LFS "Enquête Emploi")	No	No	Yes	about 7% of independents and 0.8% of the "actifs occupés" (employed people) are using - either exclusively or not - a platform
France	Nov. 2018 and Nov. 2021	Unknown	(Richet Damien, 2020[34]), based on Survey SINE Novembre 2018 and beyond	Digital labour platforms	Worked via a digital platform	Micro-entrepreneurs registered during the first semester 2018 (56 000)	No	No	No	16% of micro-entrepreneurs are working via a digital platform. For 12% this is the main source of income, for 4% this is the annex source of income
Italy	2018	In the last 12 months	INAPP-PLUS	Digital labour platforms	Provision of works and services through platforms that intermediate work	45 000 persons (residents aged between 18 and 74 years)	Yes	Yes	Yes	213 000 individuals (0.49% of the population) are labour platform workers
Singapore	2020	In the last 12 months	Labour Force Supplementary Survey on Own	Digital labour platforms	Used online matching platforms to	Approximately 4 200 persons aged 15 years	No	Yes	Yes	3.6% of the workforce were regular own account workers who took up work via online

Country	Time when the survey was conducted	Reference period	Name of the survey	Type(s) of digital platform in scope[1]	Question wording	Sample size	Definition of digital platform employment provided?	Examples of digital platforms named?	Reference to earned income?	Estimates of the prevalence of digital platform employment (%)
			Account Workers		obtain work	and over				matching platforms
Switzerland	2019	In the last 12 months and last week	Internet-mediated platform work (Swiss LFS)	Digital labour platforms, digital platforms for selling goods and digital platform for renting assets	Four filter questions on:Renting out accommodation / Taxi services / Sale of goods / Provision of other services.	11 500 persons aged between 15 and 89 years	Yes	Yes	Yes	The platform work refers to "taxi" and "other", which gives 0.4% of total population. When adding sale of goods and renting out accommodation, the total of platform services, the total of platform services amounts 1.6% of total population
United Kingdom		In the past 12 months	UK ONS (cognitive/ qualitative pilot of questions for digital platform)	Digital labour platforms	Used an online platform to find work	n/a	No	No	Yes	n/a
United States	May 2017	In the reference week	Bureau of Labour Statistics Contingent Worker Supplement	Digital labour platforms	Use a platform for digitally or physically delivered tasks	60 000 households	Yes	No	Yes	1% following recoding (3.3% based on survey responses)
United States	Nov. 2017 and 2019	In the past 6 months	US CPS Computer and Internet Use Supplement	Digital labour platforms and digital platforms for renting assets	Offered services via the Internet	Approximately 106 000 persons 15 years old and over	No	Yes	No	6% (offering capital or labour services for sale via Internet) in 2017, 7.6% in 2019
United States	Nov. and Dec. 2017	In the past month	FED Report on the Economic Well-Being of U.S. Households in 2017. Survey of Households Economics and Decision-making (SHED)	Digital labour platforms, digital platforms for selling goods and digital platform for renting goods and assets	Secondary income from online tasks or ride sharing	12 246 panel members	No	Yes	Yes	4% (paid for completing online tasks) / 2% (driving using a ride-sharing app)

Country	Time when the survey was conducted	Reference period	Name of the survey	Type(s) of digital platform in scope[1]	Question wording	Sample size	Definition of digital platform employment provided?	Examples of digital platforms named?	Reference to earned income?	Estimates of the prevalence of digital platform employment (%)
United States	Oct. 2019	In the past month	Well-Being of U.S. Households in 2018. Survey of Households Economics and Decision-making (SHED)	Digital labour platforms	Secondary income from online tasks or ride sharing	11 316 panel members	No	Yes	Yes	3% (paid for completing online tasks) / 2% (driving using a ride-sharing app)
United States	May 2020	In the past month	Well-Being of U.S. Households in 2019. Survey of Households Economics and Decision-making (SHED)	Digital labour platforms	Secondary income from online tasks or ride sharing	12 173 panel members	No	Yes	Yes	2% (paid for completing online tasks) / 3% (driving using a ride-sharing app)

Source: Adapted from (OECD, 2019[24]), Measuring platform mediated workers, OECD Digital Economy Papers No.282, OECD Publishing, https://doi.org/10.1787/170a14d9-en.

Use of alternative data sources

Although official surveys are likely to be the best tool to estimate the total number of digital platform workers and their characteristics, the relatively small overall number of digital platform workers means that sample sizes are too small to provide quality information and to allow analysis at a more detailed level (e.g. by socio-demographic variables). In addition, such surveys cannot provide information on past trends in digital platform employment. Alternative sources, such as administrative data or data provided by digital platforms may usefully complement the information gained from official surveys.

Administrative data

Administrative data can overcome the problem of small sample size, reduce the burden on data providers and the cost of data collection. However, as administrative data are not collected for statistical purposes, they may have problems of timeliness, relevance, and accuracy (Office for National Statistics (UK), 2016[43]). In addition, due to a lack of definition and to ambiguities in the regulation of digital labour platforms, they may be omitted from some datasets. For example, ride-hailing apps blur the lines between street hailing of a cab and pre-booking a chauffeur, and many apps take advantage of loopholes in existing labour market regulation (Broecke, 2018[44]). The tendency of digital platforms to locate in such blurred regulatory boundaries creates obstacles to the use of administrative data. For example, in Italy digital platform workers often lack formal contractual agreements (Cirillo, Guarascio and Scicchitano, 2019[35]) and almost half of the digital platforms are not formally registered at the National Institute for Social Security (INPS, 2018[45]). In addition, the source of income may not be identifiable (if for instance is reported from self-employed activity without further breakdown), or workers may not provide information on this type of activity, if they engage in digital platform employment as a secondary job or as a hobby. The cross-border nature of digital platforms further increases challenges to capture this type of employment, as workers may not report work done for a digital platform located in another country. Lastly, as systems of administration differ across countries, comparability is limited.

Administrative data have offered insights into contingent workers (such as employees who occasionally perform secondary work to earn additional income), though only a few studies distinguish digital platform workers from the broader group of non-standard workers.

In the United States, Collins et al. (2019[46]) used micro administrative tax data from the Internal Revenue Service (IRS) to explore the role of gig work mediated by digital platforms. In particular, they looked at tax data filed by self-employed individuals working for firms or performing independent contract work intermediated by firms. They refer to these arrangements - a subset of the broader gig economy - as the "online platform economy" for labour (labour OPE). They found that the share of workers with OPE income was approximately 1% of the workforce in 2016. Consistently with other sources, the results show that digital platform employment is mainly a secondary job to provide for a complementary income. Collins et al. (2019[46]) also included data on the number of digital platform workers by State in 2016. Moe, Parrott and Rochford (2020[47]) updated the data for New York State, by relating the annual growth in the number of these workers to the growth in the average number of for-hire vehicle trips in New York City, mainly supplied by drivers working for Uber and Lyft. The study estimated that there are about 150 000 digital platform workers in New York, representing about 1.6% of the State's workforce.

In Canada, Sung-Hee, Liu and Ostrovsky (2019[38]) introduced a definition of gig work specific to the way work arrangements are reported in the Canadian tax system and estimated the size of the gig economy using various Canadian administrative sources. They also examined the characteristics of gig workers by linking administrative data to 2016 Census of Population microdata. The study found that, from 2005 to 2016, the percentage of gig workers in Canada rose from 5.5% to 8.2%. However, their definition of gig workers is not limited to individuals working through digital platforms.

Partnerships with digital platforms have the potential to improve administrative data sources. For example, the Estonian Tax and Customs Board (ETCB) has reached an agreement with two ride-sharing platforms to share their data with the ETCB. However, drivers must first give consent to share their data, which can lead to selection bias. Denmark is developing a digital solution for declaring income arising from the sharing economy. The Mexican Tax Administration (SAT) has reached an agreement whereby drivers must be officially certified before registering with a platform (OECD, 2018[48]). In France, since 2019 digital platforms are obliged to report the annual gross income an individual earns on the platform to the tax authorities, while in Belgium platforms are obliged to both withhold taxes and report information to the tax authorities (HM Revenue and Customs, 2018[49]; European Commission, 2017[50]). As countries are developing reporting systems to obtain income data from platforms, there may be benefits to harmonise reporting systems at EU level, so to reduce the reporting burden for platforms that operate cross-jurisdictionally and increase compliance (Ogembo and Lehdonvirta, 2020[51]). An additional aspect that should be considered is that legislation may apply only to digital platforms formally registered in the country. While digital platform providing in-person services most of the times are registered in the local business register, the same doesn't apply for those mediating fully digital services.

Big data and web-scraping

The use of some alternative large datasets can also provide useful insights into the characteristics of platform workers. Harris and Krueger (2015[52]) estimated the number of US platform workers to be 0.4% of total employment by using data on the number of Uber drivers, and scaling this by the total number of Google searches for a list of 26 labour platforms (relative to the number of Google searches for Uber). The same method was used to estimate that as few as 0.05% of EU employees were active platform workers at the end of 2015 (Groen and Maselli, 2016[53]).

Using data from the bank accounts of those who received payments from digital platforms, economists at JP Morgan Chase investigated the characteristics of digital platform workers using data on 39 million Chase checking accounts (Farrell and Greig, 2016[54]; Farrell, Greig and Hamoudi, 2018[55]). In line with other studies, they found that approximately 1% of workers (twice the level of early 2016) used a digital platform, earning an average of under USD 800 per month, with the earnings of those using transportation apps having fallen by half since 2013. There is also a high rate of workers entering and leaving the sector. Such high churn highlights the need for an appropriate reference period when comparing the numbers of digital platform workers with other employment sectors. Koustas (2019[56]) used a transaction-level dataset from a large financial aggregator and bill-paying application to analyse how household balance sheets evolve when starting a "gig economy job". Based on data for about 25 000 workers from 10 popular digital platforms, the study found that entry into gig work is generally preceded by a decline in non-gig income.

The use of web-scraping can also be used to assess trends in parts of the digital platform labour market. The Online Labour Index (OLI) measures the utilisation of digital platforms mediating online labour over time across countries and occupations; although it does not give an estimate of the absolute number of digital platform workers, it does capture trends. The index is based on tracking all projects and tasks posted on a sample of platforms, using an application-programming interface (API) and web-scrapping. The index is limited to platforms through which buyers and sellers of labour or services transact fully digitally: the worker and employer are matched digitally, the payment is conducted digitally via the platform, and the result of the work is delivered digitally. The samples include the top five platforms for which it was possible to collect data over time and which accounted for at least 70% of all traffic to online labour platforms (according to Alexa's figures) (Kässi and Lehdonvirta, 2018[57]). The current sample is limited to English-language platforms.

However, data provided by platforms can have similar problems to administrative data (as the number of registered users could be higher than the number of actual users) (Office for National Statistics (UK),

2016[43]). Additionally, methods like web scraping raise some concerns regarding data protection and statistical/research ethics. Therefore, such data can only complement rather than replace surveys.

Data from platforms can give insights into general labour market problems

The rich data on earnings and hours worked by digital platforms can also serve as a resource to look at general labour market issues, beyond estimating the size of digital platform employment. This is highlighted by the study of (Cook et al., 2018[58]) who used data on over a million drivers to examine the gender wage-gap and decomposed it into its main components, such as women being less willing to work anti-social hours (perhaps due to home duties or a lack of safety in picking up passengers late at night).

Wrapping up: consistencies and differences

To date several methods have been used to measure the number and characteristics of digital platform workers, although differences in definitions and methodologies limit their comparability. These methods serve different purposes and each of them has its own strengths and weaknesses (see Table 4.3 for a summary). The choice of method depends on the research objectives, the resources available, and the trade-offs faced by statistical agencies or researchers.

A first overarching observation is that measuring the same concept of digital platform employment across national and international surveys is key for internal and international comparisons. As shown in this review, the terminology and the definitions are not harmonised across countries.

For surveys, a key problem is how to ensure that respondents understand the meaning of digital platform employment. To gain consistent statistics over time it is necessary that respondents to questionnaires have a similar understanding of the question in each period. Although giving named examples of digital platforms to respondents is an easy way to convey the meaning of digital platform employment, this can be problematic as different digital platforms enter or exit the market. Providing a clear definition of digital platform along with examples is important to ensure that respondents understand the question. However, this should not lead to overly long introductory text, as this would increase the propensity of respondent to ignore this text (Montagnier, P.; Ek, I., 2021[59]).

The overall importance of the topic of digital platform workers to a survey affects the appropriate amount of space devoted to formulating an easily understandable question. However, rather than give a detailed definition of digital platform workers, consideration should be given to asking a series of short questions concerning different elements of digital platform employment, with the interviewer or subsequent analysis then determining whether the respondent should be considered as a digital platform worker or not. Filter questions can also be used to determine the nature of the work conducted, such as whether the service was provided online or delivered physically. This approach has the advantage of ensuring the survey is robust to changes in traditional employment, such as firms using apps to roster workers' hours.

Next to the definition and clarification of the survey object, attention should also be devoted to the survey mode, as it can affect results by introducing coverage and measurement biases (see Box 4.1). While online surveys may be suitable to measure digital platform workers, they may not be representative of the overall population. Telephone or face-to-face surveys, however, may not be able to reach out to those digital platform workers who are not in national phone registers, or who are not available at the times that surveys are carried out. While evidence suggests that respondents are more honest when answering self-administered questionnaires, interviewer-administered surveys may yield higher quality results, as interviewers can correct inconsistencies in respondents' answers. Cost and time are also relevant factors to consider. Face-to-face surveys tend to be more costly and take a longer time horizon to be realised than online surveys. Accordingly, if budgets are limited or results are required quickly, the online mode might be the preferred one.

Overall, it can be concluded that there is no perfect or ideal survey mode for digital platform employment surveys. All currently existing modes have specific advantages and disadvantages, and it needs to be decided on a case-by-case basis which mode is likely to result in the best outcome, that is which shortcomings are acceptable against the specific information needs.

The choice of reference period will affect the type of workers captured by the survey. For researchers mainly interested in those who regularly engage in digital platform employment, asking whether someone performed such work in the reference week is appropriate. However, for those also wishing to capture occasional platform employment a longer time horizon is needed. Therefore, asking an additional question as to whether someone engaged in digital platform employment in the last 12 months may be appropriate, and would allow greater consistency with previous surveys.

When the objective is to ensure consistency with existing labour statistics, it is necessary to include questions on digital platform employment in the LFSs of national statistical offices, which ensures identical sampling frames and the same reference week (rather than a longer time horizon). This is likely, however, to give a lower quality estimate, as those who only perform this type of work occasionally are less likely to be captured.

The heterogeneity of labour services provided is a distinctive characteristic of digital platform employment, not normally found in traditional forms of labour provision. Therefore, careful consideration should also be given to the ordering and filtering of questions to ensure that it is clear about which episode of digital platform employment respondents are referring to when answering subsequent questions about the nature of the work or tasks they performed.

For researchers who are only interested in the use of a digital platform by a specific category of worker (such as the self-employed) it can be possible to use filter questions to identify the target group, and then phrase the question specific to that group (such as by asking the self-employed how they interact with customers). However, this approach comes at the cost of limiting data comparability with other surveys.

For researchers wishing to ensure cross-country comparability, the use of named digital platforms in survey questions may be problematic, as not all digital platforms may operate (or be equally known) in each country. The use of some existing big-data sources, such as used by Farrell et al. (2018[55]), can allow researchers to refine their research question as new digital platforms enter the market. Methodologies which rely on web-scraping may have problems of consistency over time as digital platforms are added, or dropped, from the list of the ones that are monitored. These methods also raise some ethical issues. In addition, the potential use of administrative data is likely to be limited due to differences in administrative systems across countries. Therefore, the use of surveys is likely to be the best approach to gaining cross-country statistics.

Although LFSs may be the best option for those wishing to learn about the overall prevalence of digital platform employment, ICT Usage Surveys can be a better option for assessing technology usage and online behaviours. However, attempts to date have shown that this tool may not be the best vehicle to gain descriptive statistics, due to the small number of workers included in the sample. Time Use Surveys (TUSs) have the advantage of being able to capture platform work done for short period and as a secondary occupation, but to date they have not included questions to investigate this topic, and they also have the disadvantage of being conducted very unfrequently. Finally, income surveys are appropriate to examine whether individuals have earned a significant portion of their income from digital platform employment. Both types of surveys would require inclusion of additional questions in order to capture this phenomenon.

In conclusion, while the use of official surveys such as LFSs may give more accurate estimates on the overall prevalence of digital platform employment, problems of sample size reduce their suitability for gaining insights into the characteristics of digital platform workers. Even though the sample sizes of LFSs are typically very large, they will nevertheless lack statistical precision about characteristics of potentially small groups in the population such as digital platform workers. This is all the more true for ICT Usage

Surveys, which have a smaller sample size than LFSs. Also, the nature of digital platform employment (task approach) is not that well compatible with the concepts underlying LFS. Therefore, other sources (such as ad-hoc surveys, administrative datasets or big data) provide a useful complement. At present, the possibilities of using administrative data are limited, but these may increase as tax authorities develop data-sharing agreements with digital platforms. In addition, the use of online surveys can reduce costs (though possibly at the expense of reduced accuracy and sampling bias), allowing researchers to reach out to a larger number of respondents. Such approaches can complement official surveys, which can be used to test the overall accuracy of other approaches and to calibrate their results.

Based on this review, potential next steps should include the formulation of questions to be included in a range of official surveys (e.g. regular LFSs and ad-hoc modules within LFSs). It is also necessary to decide upon the most appropriate tool (and frequency) for addressing different facets of the phenomenon: for example, a short list of questions in core (monthly or quarterly) LFS questionnaires may be appropriate to monitor the evolution of digital platform employment over time. A longer list of questions in less frequent survey supplements (e.g. ad-hoc modules in LFS, or TUSs or income survey supplements) on the other hand may be more appropriate to illustrate the variety and regularity of tasks performed by workers in digital platform employment and their characteristics and sources of income. Finally, more experimentation in terms of ordering of questions and use of prompting questions may be necessary before such questions are included in surveys. These points and additional methodological recommendations are further developed and discussed in Chapter 5.

The nature of work and its use of digital platforms are evolving rapidly. The frontiers between the various working arrangements and their legal status are blurring, and so are the workers' perceptions of their occupations. This makes it difficult to accurately measure the evolution of digital platform employment. Although no optimal approach currently exists, this chapter suggests that a mixed approach, combining several measurement instruments (general population surveys, ad-hoc surveys, administrative data, web scraping, etc.), is needed.

Table 4.3. Overview of sources and methods to estimate size and characteristics of digital platform employment

Method/ source	Purpose/ Best suited for	Example of indicators*	Advantages	Disadvantages	Further comments
Official surveys					
Labour Force Survey	• Estimate the share of the workforce engaged in digital platform employment and monitor evolution over time	• Share of workforce engaged in electronically mediated work • Share of workforce that earned income from platform mediated work • Share of own account workers engaged in digital platform employment	• Same sampling frame as general statistics on labour market, which may ensure comparability with overall data on labour market and may provide accurate estimates on the overall prevalence of digital platform employment	• Difficulties in tracking digital platform workers as the focus is on a worker's primary job. Could be unreliable in coverage of secondary jobs and self-employment and not capture the diversity of employment contracts • The nature of digital platform employment (task-based) may not be fully compatible with concepts underlining the labour force surveys (job/occupation comprising several tasks) • The small absolute number of digital platform workers may hinder further analysis of workers' characteristics • Using the past week as reference period is not suitable to capture occasional digital platform workers • Difficulties and divergences in understanding the	• Need to harmonise definition and scope to ensure comparability • Respondents need to have the same understanding of digital platform employment • Naming specific digital platforms helps but may limit comparability across time and countries, and result in conservative estimates • Providing a detailed description of digital platform employment helps but may be cumbersome for a regular survey • Filtering questions could be used to determine whether it is a digital platform worker or not • Question wording should be consistent (to offer for sale/provide a service), and broad so to capture also secondary job

				• question may lead to unreliable results or overestimates • Small differences in question wording may have a large effect on the estimated number of digital platform workers	
ICT Usage Survey	• Estimate the share of Internet users engaged in digital platform employment • Technology use and online behaviours	• Share of Internet users using Internet to offer own services/obtain paid work/earn income	• Same sampling frame as for statistics on ICT, which may ensure comparability with other aspects of online activities and the digital economy	• Small sample size, which associated with the small absolute number of platform workers reduces reliability of findings • Difficulties and divergences in understanding the question may lead to unreliable results or overestimates	
Income Survey	• Share of income earned through digital platform employment				• A specific module on income earned through digital platforms should be developed
Time Use Survey	• Identify share of time spent in activities related to digital platform work and employment (as secondary activity)			• Not very frequent	• A specific module on time devoted to relevant online activities should be developed
Surveys by non-official organisations					
Ad-hoc Survey	• Provide information on workers' characteristics and employment/working conditions • Estimate the share of the population	• Share and characteristics of adult population providing services via digital	• Higher flexibility compared to official surveys, it could include a higher number of questions to explore a wider spectrum of issues on digital platform employment (both quantitative and qualitative)	• Potential selection and sampling biases (overrepresentation of online workers among respondents) • Potential measurement bias linked to survey	• High heterogeneity of methodologies, little comparability among studies

	engaging in digital platform employment	platforms	• Lower cost of online surveys	method used (face-to-face/CATI/online/paper form) • Monetary incentives given to respondents may bias the results • The above biases reduce comparability	
Alternative data sources					
Administrative data (tax data)	• Estimate the number of digital platform workers and income from digital platform employment • Examine specific aspects related to digital platform employment (e.g. gender pay differential)	• Share of workers with income from digital platform employment	• No issues related to sample size and techniques • Lower burden on data providers • Lower cost of data collection	• Data originally collected for different purposes, they may have problems of timeliness, relevance and accuracy • There is often no distinction of digital platform employment from the broader non-standard work (i.e. may include gig work performed outside digital platforms) • Differences in administrative systems across countries • Potential underestimation due to blurred regulatory boundaries, cross-border nature of digital platforms, underreporting by workers and if the source of income is not identifiable	
Big data	• Infer number of digital platform workers through e.g. bank account data	• Share of workers using a digital platform and	• Reliable results	• Results are not representative • No access to underlining (privately-	

		related earnings		owned) data	
Web-scraping	• Specific purposes, e.g.: • Monitor trends in supply and demand of online freelance labour	• Number of open, completed and new vacancies posted across (selected) digital platforms	• Real-time updates • Comparability across time	• May be difficult to extend (e.g. from English platforms to platforms in other languages) • May provide trends but not absolute numbers • Ethical issues (as data is used for other purposes than those consent was given to)	

Note: *It includes illustrative examples based on the reviewed studies.
Source: OECD STI elaboration.

Annex 4.A. Questions posed in surveys

Annex Table 4.A.1. Questions posed in surveys of private agencies

Survey and countries covered	Questions (or selection method)
Alsos et al. (2017) Norway	**Pilot Question:** Recently, there has been a lot of attention around companies that use apps and websites to convey work and services. This is usually called the sharing economy. Below are a list of such companies. Have you done any assignments or paid employment through one or more of the following companies in the last 12 months? 1. Uber 2. Foodora 3. weClean 4. Upwork 5. Konsus 6. Haxi 7. FINN småjobber 8. Other _____ 9. No **Round 3 Question:** Recently, there has been a lot of attention around companies that use apps and websites to convey work and services. This is usually called the sharing economy. During the last 12 months, you have done some of the following ... 1. Did you work as a bicycle courier for Foodora? 2. Worked as a cleaner for WeClean? 3. Worked for Upwork or Konsus? 4. Worked as a driver for Haxi? 5. Did a job you found on FINN småjobber? 6. Did you do a job on Mitt anbud.no? 7. Rented a home on AirBnb? 8. Done assignments you have found on other apps or websites _____ 9. None of the aforementioned
Bonin & Rinne (2017) Germany	Even if you are not doing it now, have you ever done work in exchange for money, for orders that you received over the Internet or an app?
CIPD (2017) United Kingdom	Thinking about the LAST 12 MONTHS, which, if any, of the following have you done via an online platform (i.e. website) or app (i.e. mobile device application) to earn money? (Please tick all that apply) Provided transport using my vehicle (e.g. Uber, BlaBlaCar etc) Rented out my vehicle (e.g. EasyCar, Zipcar etc) Rented/shared my accommodation (e.g. AirBnB, tripping, HomeAway etc) Delivered food or goods (e.g. Deliveroo, City Sprint) Performed short-term jobs via online platforms that connect

	people looking for services (e.g. TaskRabbit, Upwork, PeoplePerHour etc) Sold things I have created via online platforms (e.g. Etsy) Other work arranged through an online platform (open) Still thinking about the LAST 12 MONTHS, what contribution did the following type of work make towards the total income you received from paid work over the past year? Provided transport using my vehicle (e.g. Uber, BlaBlaCar etc) Rented out my vehicle (e.g. EasyCar, Zipcar etc) Delivered food or goods (e.g. Deliveroo, City Sprint) Performed short-term jobs via online platforms that connect people looking for services (e.g. TaskRabbit, Upwork, PeoplePerHour etc) Other work arranged through an online platform
Eurobarometer (2016) European (Eurostat related) countries	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. Have you ever provided services on these platforms? No, you haven't. 1 You have offered a service on one or more of these platforms once 2 You offer services via these platforms occasionally (once every few months) 3 You offer services via these platforms regularly (every month) 4 Other 5 None 6 DK/NA 7
Farrell, D. and F. Greig (2016), Paychecks, Paydays, and the Online Platform Economy - Big Data on Income Volatility.	No questions. Based directly on income flows originating from a selection of platforms. In 2016, 42 platforms were selected.
Farrell, D. and F. Greig (2018), The Online Platform Economy in 2018, Drivers, Workers, Sellers, and Lessons. https://www.jpmorganchase.com/content/dam/jpmc/jpmorgan-chase-and-co/institute/pdf/institute-ope-2018.pdf United States	128 platforms were selected, based on 3 key criteria: platforms i/ connect independent suppliers directly with demanders, ii/ mediate payment, and iii/ empower participants to enter and leave the market whenever they want.
Huws, U., N. Spencer and S. Joyce (2016), Crowd Work in Europe: Preliminary results from a survey in the UK, Sweden, Germany, Austria and the Netherlands.	No questionnaire in the report published.
(Huws et al., 2019[6]) 13 European countries	No questionnaire in the report published.
Katz L. and Krueger A. (2016), The Rise and Nature of Alternative Work Arrangements in the United States, 1995-2015	Do you do direct selling to customers on your main job or a secondary job, or both? Does your direct selling involve goods or services? Do you work with an intermediary, such as Avon or Uber, in your direct selling activity? Do you work with an online intermediary to find customers, such as Uber or TaskRabbit?
(Le Ludec, Tubaro and Casilli, 2019[8]) France	No questionnaire in the report published.
(Lepanjuuri K., 2018[5]) United Kingdom	Detailed questionnaire not provided.
Manyika, J. et al. (2016), Independent work: Choice, necessity, and the gig economy United States and EU-15 countries	Detailed questionnaire not provided.
Pesole, A. et al. (2018), Platform Workers in Europe, Publications Office of the European Union	Has the respondent ever gained income from: 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; or 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
Pew Research Center (2016), *Gig Work, Online Selling and Home Sharing*. United States	Some people find paid jobs or tasks by connecting directly with people who want to hire them using a particular type of website or mobile app. These sites require workers to create a user profile in order to find and accept assignments, and they also coordinate payment once the work is complete. In the last year, have you earned money by taking on jobs through this type of website or mobile app (for example, by driving someone from one place to another, cleaning someone's home, or doing online tasks)? (Y/N) What sorts of jobs or tasks have you performed in the last year using these services? Driving for a ride-hailing app (such as Uber or Lyft)6 Shopping for or delivering household items Performing tasks online (like completing surveys or doing data entry) Cleaning someone's home or doing laundry Something else
SOU (2017) Sweden	In which, if any, of the following ways have you ever personally carried out paid work using a website or mobile phone application? 1. Providing a driving or taxi service, for a fee, by finding passengers through a website or app such as Uber or BlaBlaCar 2. Providing professional work, such as consultancy, legal advice, accounting services, through a website or app such as UpWork, PeoplePerHour or Freelancer 3. Providing creative or IT work, such as writing, graphic design, or web development, through a website or app such as UpWork, Freelancer, PeoplePerHour, Fiverr or Toptal 4. Providing administrative work, such as data entry or 'click work', through a website or app such as Clickworker, PeoplePerHour or Freelancer 5. Providing skilled manual work, such as plumbing, building, electrical maintenance and carpentry, through a website or app such as Rated People, MyBuilder or TaskRabbit 6. Providing personal services, such as cleaning, moving, or DIY tasks, through a website or app such as TaskRabbit, Hassle or Handy 7. Providing delivery or courier services, through a website or app such as Deliveroo, UberEATS or Just Eat

Source: OECD STI elaboration.

Annex Table 4.A.2. Questions posed in official surveys

Survey	Questions
Australians and the Gig Economy Survey, Prevalence and characteristics of digital platform work in Australia (2019)	Questions relate to earning income through digital platforms; Renting, Leasing, Selling or Licensing through Platforms; experience with platform work (e.g. period, frequency, hours per week, perceived importance of the income, reasons to work or offer services through digital platforms); details related to the main digital platform used (name, type of work or service offered, methods of payment, amount paid per hour, hours spend per week and share of time spent on unpaid tasks, etc.); details on functions and regulation characteristics of the platform (e.g. subscription fees, insurance, rating by clients, dispute settlement process, etc.). Detailed questionnaire provided pp.85 to 97 of the publication.
Canada LFS (LFS Fast Track Module –October 2016 collection)	In the past 12 months, did you offer ride services such as Uber, Lyft, etc.? In the past 12 months, did you offer private accommodation services such as AirBnb, Flipkey, etc.?
Canada Internet Use Survey (2018 survey)	***Online work*** During the past 12 months have you used the Internet to earn income? (Y/N) *Include money made through online bulletin boards* If Yes: What type of income was this? Was it a: Main source of income / Additional source of income Through what method did you earn this income during the past 12 months? *Select all that apply.* Was it through: Online bulletin board for physical goods (e.g., Etsy, Kijiji, Ebay) / Online bulletin board for services (e.g., Kijiji, Craigslist) / Platform-based peer-to-peer services (e.g., Uber, AirBnb, AskforTask) / Online freelancing (e.g., Upwork, Freelancer, Catalant, Proz, Fiverr) / Crowd-based microwork (e.g., Amazon Mechanical Turk, Cloudflower) / Advertisement-based income (e.g., income earned through YouTube or personal blogs) / Other What is your best estimate of the total income you earned through the Internet during the past 12 months? Would you say: Less than USD 200 / USD 200 to less than USD 1 000/ USD 1 000 to less than USD 10 000 /USD 10 000 to less than USD 20 000 / USD 20 000 to less than USD 50 000 / USD 50 000 or more
Canada Internet Use Survey (2020 survey, forthcoming)	***Online work*** The next questions ask about the job or business you usually worked the most hours, if you had more than one job. Which of the following best describes your usual place of work at your main job or business? Do you: *1: Work at a fixed location outside the home* *2: Work outside the home with no fixed location (e.g., driving, making sales calls)* *3: Work at home (Include work done at the same address as your home, but on a different part of your property.)* Excluding overtime, do you work any of your scheduled hours at home? (Y/N) During the past 12 months, have you done any telework from any of the following locations? Was it from: Home (Y/N) Co-working spaces (Y/N) Other locations (Y/N) Did not do any teleworking in past 12 months (Y/N) During the past 12 months, have you used an Internet-connected device at home that was provided by your employer? (Y/N) During the past 12 months, was there an expectation from your employer that you use the Internet to stay connected outside of your regular work hours? (Y/N) The following question is about money that you personally earned online in the past 12 months. *Please remember that your answers will be kept strictly confidential.* During the past 12 months, how much did you personally earn by doing the

	following activities online? (Min = 0; Max = 99999999) *Selling physical goods online that you built or created* *Selling services via online bulletin boards* *Providing platform-based peer-to-peer accommodation services* *Providing platform-based peer-to-peer ride and delivery services* *Providing other platform-based peer-to-peer services* *Online freelancing* *Crowd-based microwork* *Earning income through online advertisements and sponsored content* *Other activities*
Denmark LFS	Have you earned money in the past 12 months by performing work done through websites or apps - for example, via Uber? (Y / N) In the past 12 months, have you earned money by renting your property or your property through websites or apps for example via Airbnb? (Y/N)
Eurostat, Community Survey on ICT Usage and e-commerce in Households and by Individuals, 2018	B8. Have you obtained paid work by using an intermediary website or apps (e.g. Upwork, TaskRabbit, Freelancer, Amazon Mechanical Turk) in the last 12 months? Websites of employment agency are excluded *If YES to B8 go to B8.1, otherwise C1* B8.1. If Yes to B8: Could you please specify if the income of this work is: a) the main source of your income b) an additional source of income
Finland LFS	Have you during the past 12 months worked or otherwise earned income through the following platforms: 1. Airbnb, 2. Uber, 3. Tori.fi/Huuto.net, 4. Solved, 5. Some other, 6. None of the above.
France LFS (Ad Hoc Module 2017)	How do you mainly get in touch with your clients? *Many answers possible (if the respondent can't choose)* *Don't read item 5.* 1. Clients come into the shop or contact you directly (phone, mail, Internet etc.) 2. Clients go through a platform or through a third party business that redirect them to you. 3. You're directly looking for clients / contact yourself the clients. 4. Other 5. Not meaningful
France Dispositif SINE, Interrogations 2018 et suivantes	*31. Travaillez-vous par l'intermédiaire d'une ou plusieurs plates-formes numériques de mise en relation (exemples : VTC, livraison à domicile, services à la personne, services ou conseil aux entreprises, …) ? UNE SEULE RÉPONSE* *Oui, c'est ma principale source de chiffre d'affaires..... 1* *Oui, mais c'est une activité annexe..... 2* *Non..... 3*
Italy (INAPP-PLUS 2018)	1. In the last year, have you earned money by accepting jobs through this type of site or mobile app, e.g., driving someone from one place to another, delivering meals on wheels, cleaning someone's house, or performing tasks (Hit) online? (Yes/No/No answer) 2. What types of work or activities have you performed in the last year using these services? Driving for a travel application (such as Uber or Lyft) / Purchase or delivery of household items / Delivery meals/Performing online activities (such as completing surveys or entering data)/Cleaning someone's house or doing laundry/Something else (specify) /No answer 3. Can you tell us the net income you earned in 2017 from this job? 4. In relation to the income you earn from this work, which of the following statements best describes it? It is essential to meet my basic needs / It is an important component of my budget, but not essential / It's convenient for me to have it, but I could easily live without it. / No answer 5. How are you contractually framed when you provide these services?

	Coordinated and continuous collaboration (Co.Co.) / Occasional collaboration (withholding tax) / Business owner / Entrepreneur / Own business (VAT number) / Franchising / Ancillary work / Cooperative or company member / Familial Adjuvant / Informal agreements (No formalised contract) / I do not know or do not remember the contractual form.
Singapore Labour Force Supplementary Survey on Own Account Workers	Please indicate the online matching platform(s) used to take up work as an own account worker in the past 12 months (e.g. ride-hailing platforms, food delivery platforms, etc.)
Switzerland – ad-hoc LFS module (2019) on "Internet-mediated platform work"	Finally, we would like to ask you a few questions on new forms of work. Internet platforms and apps make new income opportunities possible today. You are put in contact with the client and generally paid directly via the platform. Have you rented a room, apartment or a house to somebody via an internet platform or app such as Airbnb or Flipkey in the past 12 months? Have you provided taxi services via an internet platform or app such as for example Uber or Lyft in the past 12 months? Have you sold goods via an internet platform or app such as Ricardo or Ebay in the past 12 months? Please only answer "yes" if you previously collected, bought or produced the goods with the specific aim of reselling them. Have you provided other services via an internet platform or app such as cleaning, handiwork, delivery services or online programming in the past 12 months? In what activity area do you provide these paid services? Cleaning; Food delivery; Goods transport and delivery; Handiwork; Programming/online support; Translation; Data / text entry; Web / graphic design; Other activity area; Don't know; No answer Have you provided one of these paid services in the past week via an internet platform or app? How many hours have you spent working on this service or these services in the past week? number of hours/ don't know/No answer Did you provide these paid services via an internet platform or app as part of your main job or was this an additional job? (Interviewer: several answers possible): Main job/Additional job/don't know/No answer Did you provide these paid services via an internet platform or app as part of your main job or second job or was this an additional job? (Interviewer: several answers possible): Main job/Second job/Additional job/Don't know/No answer. Why did you choose this form of work? additional income opportunity/most suited to one's own qualifications/did not find a traditional job/ flexible working hours (day/night, at the weekend,...)/flexible workplace (home office, work on the go,...)/reconciliation with family life/ reconciliation with studies/other reason:…/don't know / no answer How long have you been providing paid services via an internet platform or app? - for less than 1 year/for 1 to less than 2 years/for 2 to less than 5 years/for 5 years and more/don't know/no answer How often do you provide these paid services via an internet platform or app? almost every week/almost every month/sporadically, i.e. several times a year/one-off activity /don't know /no answer On average, how many hours per week have you spent working in the past 12 months on these paid services? Number of hours /don't know /no answer On average, how many hours per month have you spent working in the past 12 months on these paid services? Number of hours /don't know /no answer Please estimate how many hours you have spent working in total in the past 12 months on these paid services: Number of hours /don't know /no answer What percentage of your income from your main job comes from the income from these paid services provided via an internet platform or app? Share as a %/don't know/no answer What percentage of your income from your second job comes from the income from these paid services provided via an internet platform or app? Share as a %/don't know/no answer Could you tell me your monthly gross income from these paid services provided via an internet platform or app? INCOME/don't know/no answer Could you estimate your monthly gross income from these paid services? Up

	to CHF 250 / CHF 251 – 500 / CHF 501 – 1000 / CHF 1001 – 2000 / CHF 2001 – 3000 / CHF 3001 - 4000 / CHF 4001 – 5000 / More than CHF 5000 / don't know / no answer Could you tell me your annual gross income from these paid services provided via an internet platform or app? INCOME/don't know/no answer Could you estimate your annual gross income from these paid services? Up to CHF 3000 / CHF 3001 - 6000 / CHF 6001 - 12000 / CHF 12000 - 24000 / CHF 24001 – 36000 / CHF 36001 – 48000 / CHF 48001 - 60000 / More than CHF 60000 / don't know / no answer What is the name of the internet platform or app that you use to provide the paid services? Airbnb/Flipkey/Uber/Lyft/Ebay/Ricardo/other internet platform/app:…/don't know/no answer.
Switzerland, ICT usage survey 2017 and 2019, Enquêtes OMNIBUS TIC 2017 and 2019	In 2017: In the past 12 months, have you done paid work using any internet platform or application as an intermediary, e.g. TaskRabbit, Mechanical Turk, Freelance, etc. ? *READ IF NECESSARY: Do not consider job posting sites but only sites where work is done and paid by task or mandate.* 1) Yes, as main job 2) Yes, as a secondary or casual job 3) No 9) Don't know / No answer In 2019: *The next question is about paid work obtained through a site or application. These may be physical tasks or services transmitted over the Internet, carried out for individuals or for companies. Any work that is paid by task or mandate should be considered, not just self-employment.* 1) In the past 12 months, have you gotten paid work through any site or app, for example TaskRabbit, Mechanical Turk, Freelancer, Upwork, Batmaid, Uber, etc. ? *Be careful, do not consider job posting sites and placement agencies.* 2) Was the income from this work your main source of income?
US CPS Computer and Internet Use Supplement (2017 and 2019)	Have you offered own services for sale via the Internet (Examples include offering rentals on Airbnb and driving for Uber or Lyft. Do not include any goods or possessions sold online, such as clothing, shoes, or crafts.)
US Federal Reserve (2018), Survey of Households Economics and Decision-making (SHED).	In the past month, have you been paid for each of the following online occasional work activities or side jobs? *Please do not include activities that you only do as part of your main job* a. Completing paid online tasks, such as on Amazon Services, Mechanical Turk, Fiverr, Task Rabbit, or YouTube. (Y/N) b. Renting out property online, such as your car, your place of residence, etc. (Y/N) c. Selling goods online through eBay, Craigslist, or other websites (Y/N) d. Driving using a ride-sharing app such as Uber or Lyft. (Y/N) e. Other online paid activities (do not include taking GfK Surveys). (Y/N)
US Federal Reserve (2019 and 2020), Survey of Households Economics and Decision-making (SHED)	In the past month, have you been paid for each of the following activities? Childcare or eldercare services/Dog walking, feeding pets, or house sitting/House cleaning, yard work, or other property maintenance work/Driving or ride-sharing, such as with Uber or Lyft/Paid tasks online/Other paid personal tasks, such as deliveries, running errands, or helping people move *Note: the Gig Economy section includes additional questions not reported here*
Bureau of Labor Statistics, May 2017 Contigent Worker Supplement	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. For example, using your own car to drive people from one place to another, delivering something, or doing someone's household tasks or errands. Does this describe ANY work you did LAST WEEK? Y/N Was that for your main job, your second job, or other additional work for pay? Main job Second job Additional work for pay

	Some people select short, ONLINE tasks or projects through companies that maintain lists that are accessed through an app or a website. These tasks are done entirely online and the companies coordinate payment for the work. For example, data entry, translating text, web or software development, or graphic design. Does this describe ANY work you did LAST WEEK? Y/N Was that for your main job, your second job, or other additional work for pay? Main job Second job Additional work for pay
UK ONS (cognitive/qualitative pilot of questions for digital platform)	In the last 12 months have you used a digital platform to find work on a short term, payment by task basis? Does the work you found on a digital platform provide your main source of earnings over the past three months?

Source: OECD STI elaboration.

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Notes

[1] This chapter is mainly based on OECD (2019[24]).

[2] The chapter includes studies whose aim is to estimate the size of digital platform employment drawing on quantitative methods, published by October 2020 in English (with the exception of a few studies in national languages). Although the chapter aimed at including as many available studies as possible, the evidence considered has to be intended as illustrative, rather than exhaustive.

[3] This result was confirmed in (Katz and Krueger, 2019[60]), after the authors re-examined their results based on data from the CWS survey carried out in 2017, the RAND CWS 2015 survey and administrative tax data from the Internal Revenue Service (IRS) for 2000 to 2016. In line with (Farrell, Greig and Hamoudi, 2018[55]), they estimate that "only 0.5 percent to 1.5 percent of the workforce was engaged in online work for sample periods covering late 2015 to the end of 2017".

[4] Capture-recapture is a method commonly used in ecology to estimate an animal population's size where it is impractical to count every individual. A portion of the population is captured, marked, and released. Later, another portion will be captured and the number of marked individuals within the sample is counted. Since the number of marked individuals within the second sample should be proportional to the number of marked individuals in the whole population, an estimate of the total population size can be obtained by dividing the number of marked individuals by the proportion of marked individuals in the second sample (Wikipedia, 2020[61]).

[5] Austria, Czech Republic, Estonia, Finland, France, Germany, Italy, the Netherlands, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

[6] The French estimate fell to 11% in 2018, suggesting that understanding of the question by respondents changed over time.

[7] Croatia, Czech Republic, Finland, France, Germany, Hungary, Ireland, Italy, Lithuania, the Netherlands, Portugal, Romania, Slovakia, Spain, Sweden and the United Kingdom.

[8] "Platform work" in the original study.

[9] "Platform mediated work" in the study.

[10] The sample was constructed to be nationally representative according to gender, age and State/Territory and was administered by the Online Research Unit (ORU), an Australian-based online research panel provider.

[11] "Gig-economy work" in the study.

5 Measurement recommendations

This chapter describes the statistical initiatives of different institutions that undertook measurement of digital platform employment, in order to assess it and provide recommendations for the future. As most of these experiments do not rely on established methodologies, this chapter is a contribution to build a shared measurement framework based on common vocabulary, common definitions and a common understanding of the phenomenon. In practice, a template was provided to different members of the Technical Expert Group in order to harmonise their contributions. Statistical experiments are described along the following dimensions: i) original purpose of the initiative; ii) reference population and sampling; iii) other relevant survey features (e.g. time references, data collection mode); iv) implied operational definition; v) obtained goals and lessons learned. Finally, the chapter distils some recommendations drawn from these experiments that should guide future statistical endeavours in this area.

Introduction

Digital platforms are a multi-domain phenomenon, which can be observed either from the point of view of the worker, the client or the platform itself. High-quality statistics on digital platforms can inform about their impact on the labour market evolution and on its economic and social aspects. This has an implication on the sectoral structure of the economy but also on the technological evolution, on the production innovation process and recently also on the cultural evolution, with new terms entered in the vocabularies. During the COVID-19 pandemic, these platforms entered into own lives, helping in delivery of goods for confined populations and in working from home for those who were living under restrictions.

This variety of dimensions is discussed in Chapter 4, which describes different information sources according to different information needs and different domain of analysis. Information needs are driven by different policy interests and concerns: tax authorities, employment ministries, national accounts analysts and others will propose different operational definitions of the phenomenon and will use different sources accordingly.

Chapter 5 aims to be more practical, looking at actual measurement experiences. This chapter builds on evidence drawn from different testing exercises to generate standard questionnaires and methodologies for various types of surveys or other sources.

Its objective is to describe the initiatives from different institutions that undertook some actual measurement on the digital platform employment (DPE), in order to learn from these experiences and provide recommendations for the future. Most of the experiences discussed in the chapter are still experimental and do not rely on established methodologies, this is a contribution to build a shared measurement framework based on common vocabulary, common definitions and even a common understanding of the phenomenon.

Different members of the Technical Expert Group contributors have contributed to this chapter, bringing their experiences on generating information on DPE from different sources. In order to harmonise their contributions, and to facilitate comparisons, a common template was provided to authors, asking them to describe:

- **Original purpose of the initiative:** Investigating which are the objectives and underlying questions the measurement experience aims at answer. For example, if the interest is in the quantitative dimension of the phenomenon, how many persons involved in DPE are in the population? If the interest is on the qualitative labour market features then the questions can be which are the DPE persons' characteristics or which are their background features (demographic, education, previous experiences)? If the interest is on the social aspects of the market then the questions can be which are their working conditions? Or which is the degree of formality/informality of the working arrangements? If the interest is on the work itself then the question is which are the features of the job (driving, delivery, services to household, freelance such as program coding/translation)? If the interest is on the technical and innovation features then the question can be which is the type of the platforms (providing online or on-location work) and how many are they?
- **Reference population and sampling:** Providing a description of the statistical units (that can be households, individuals, enterprises, platforms). According to the population, different sampling techniques can be applied and should be here clarified. The coverture is also interesting: does the survey reach the entire population with uniform inclusion probability or has the sample been extracted in order to focus one particular sub-population? The dimension of the sample of course also determine the statistical significance of the measure.
- **Other relevant survey features:** Any other relevant feature such as time references, data collection mode (Personal, telephonic, web based, …) and any other methodological choices. This is particular important to compare different sources: yearly data is necessarily different from data referring to a single week.

- **Implied operational definition:** General and operational (often only implicit) definitions of the analysed concepts. With, if possible, a description of the consequences of the practical definition chosen. For example it may be that some parts of the phenomenon are excluded, that some platforms are not considered, or other limitations due to the boundary built around the definitions. This should be linked to the conceptual framework as described in Chapter 3. The main questions are:
  1. does the operational definition include goods and/or services (for example only include the provision of services but not production of goods)?
  2. is it limited to some specific types of digital platforms (for example restricted to digital labour platforms only, with the exclusion of other specific types of platforms such as Airbnb, YouTube, Instagram, or includes only platforms with direct intermediation i.e. triangular relationship)?
  3. is it restricted to a specific employment status, for example own-account workers only excluding employees or volunteer work?
  4. is it limited by any other implicit or explicit restriction (only telephonic apps, only web browser platforms, only national based platforms, …) and definition used (is there a definition for algorithm, for platform, for employment (ILO strict concept or larger))?
- **Obtained goals and lessons learned:** Possibly including some figures, some policy consequences already actuated (if relevant), a list of do and do not for the future and a short presentation of lessons learned about a better understanding of the DPE market or at least on how to measure it. This is also the template used to present the measurement experiences reviewed below. The last section distils some statistical recommendations from these experiences that, in the TEG's view, should guide future statistical endeavours in this area.

Labour Force Surveys

Labour Force Surveys (LFSs) collect information on the supply side of the labour market, i.e. from worker's perspective. Sampling units are either households or individuals, but the aim is always to provide information on individuals belonging to the (non-institutional) resident population. Given the large reference population, LFSs are well suited to capturing general dynamics of participation rather than to provide detailed information on small phenomena: even if their sample is large, the probability to include in the sample enough observations on small phenomena is low. While LFSs are a potentially good solution to estimate the total number of digital platform employed persons, they lack in statistical precision when studying particular characteristics of sub-groups of workers in DPE. Generally, LFSs are fit for quantitative analysis but if a qualitative analysis is needed then a smaller survey, with a more focused reference population, can provide more details. Several countries experimented (or are experimenting) the use of the LFS in the DPE domain.

US Bureau of Labour Statistics

Original purpose

The Current Population Survey (CPS) is the US monthly Labour Force Survey from which the official unemployment rate, alongside with other measures about the work force, are derived. In May 2017, BLS added four questions about digital platform employment (DPE) to the periodic CPS supplement on workers in "contingent and alternative work arrangements" (CWS).

The purpose of these four DPE questions was to measure the number of people employed as digital platform workers in the United States. By virtue of the DPE questions being asked as part of a supplement

to monthly CPS, the questions also were designed to obtain demographic information and job characteristics of digital platform workers. For example, dependent on the estimated number and sample size, the gender, race, ethnicity, marital status, immigration status and educational attainment of digital platform workers could be quantified and compared to those of non-digital platform workers. The industry, occupation, usual and actual hours worked, multiple job holding status and earnings of digital platform workers could also be examined. Using information collected in other parts of the CWS module, information about whether digital platform workers have health insurance, the source of health insurance for those who have it, and job search activities could also be explored.

The original intention of these supplementary questions was to determine whether digital platform workers engaged in this type of work as their primary job or as secondary work. The DPE questions also were designed to distinguish between location-based platform workers (where tasks are performed offline in real physical locations) and online web-based platform workers (where tasks are performed online and remotely by workers). No other information about platform work (such as the names of the platforms used, the platform's work rules, or how workers obtain assignments from the platform) was collected through these questions.

Reference population and sampling

The reference population of the monthly CPS is the US non-institutional population age 16 and older. Because the DPE questions were part of a supplement to the CPS, the sample design was the same as that of the CPS. The CPS uses a multi-stage, stratified random sample of approximately 72 000 housing units from 852 sample areas throughout the United States. Use of this reference population also allows estimates to be in accord with other US labour force measures.

Other relevant survey features

The CPS is typically conducted in the week containing the 19th of the month, and asks respondents about their activities in the prior week. To DPE questions were asked to individuals who had been classified as employed during the week of May 7- 13, 2017. As with the monthly CPS, the DPE questions were asked by Census Bureau interviewers using a computerized questionnaire. These interviews were conducted using a combination of in-person and phone interviews. Phone interviews were conducted either from interviewers' residences or from centralized facilities.

Implied operational definition

The questions included in the CWS module of the CPS were:

> **Introduction** - I now have a few questions related to how the Internet and mobile apps have led to new types of work arrangements. I will ask first about tasks that are done in-person and then about tasks that are done entirely online.
>
> **Q1** 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.
>
> For example, using your own car to drive people from one place to another, delivering something, or doing someone's household tasks or errands.
>
> Does this describe ANY work (you/NAME) did LAST WEEK?
>
> **Q1a** Was that for (your/NAME's) (job/(main job, (your/NAME's) second job)) or (other) additional work for pay?[1]

> **Q2** Some people select short, ONLINE tasks or projects through companies that maintain lists that are accessed through an app or a website. These tasks are done entirely online, and the companies coordinate payment for the work.
>
> For example, data entry, translating text, web or software development, or graphic design.
>
> Does this describe ANY work (you/NAME) did LAST WEEK?
>
> **Q2a** Was that for (your/NAME's) (job/(main job, (your/NAME's) second job)) or (other) additional work for pay?

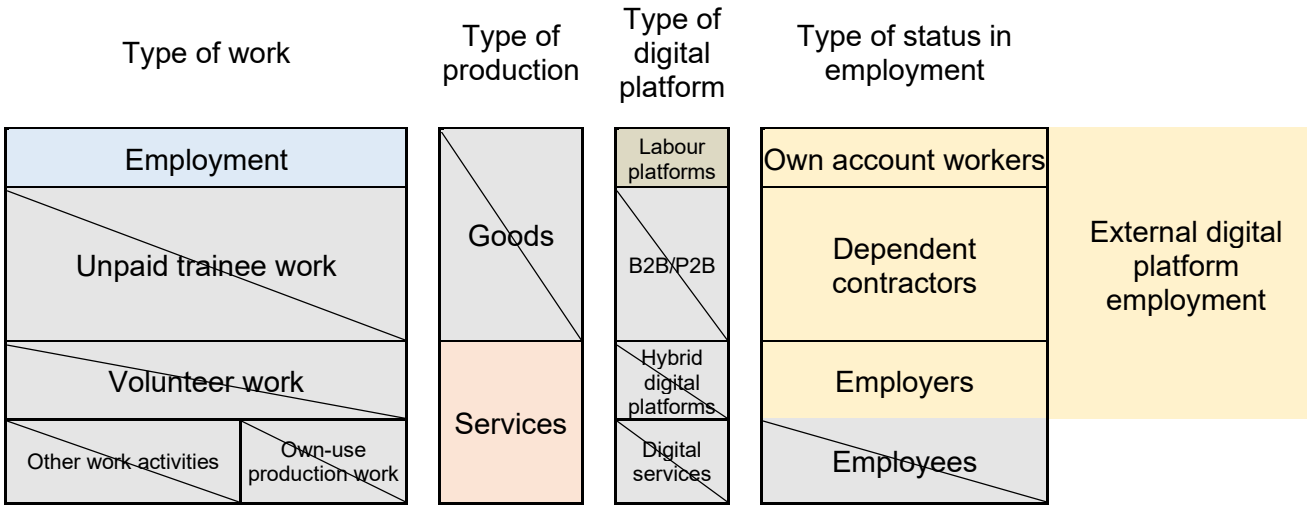
The questions about DPE workers in the CPS supplement operationally defined DPE workers as workers who obtained tasks, job or projects through an online platform, and whose customers used the same online platform to pay for the services provided. This operational definition of DPE workers encompasses both location-based platform workers (e.g. rideshare drivers, delivery workers, and home service providers) and online web-based platform workers (e.g. web developers, translators, and content mediators). To be counted as a DPE worker in the CPS supplement, individuals must be employed. People involved in volunteer work, unpaid trainee work, and own use production work are therefore excluded, even if their work was done through or on a digital platform. All types of employed individuals can be DPE workers, except unpaid family workers. Self-employed (own account workers) can be classified as DPE workers regardless of whether they have employees or are incorporated businesses.

The CPS definition of DPE workers, by virtue of the questions wording and their restriction to those who are employed, only includes workers using digital labour platforms. By asking about tasks or jobs that people obtain through an app or website, this definition implicitly excludes individuals with income generated from the selling of new or used goods online. This definition also implicitly excludes those who generate income from the rental of property and activities associated with generating this income. However, direct questions to screen out these activities were not explicitly asked - it should be noted that these exclusions from the definition of DPE workers did not preclude from being counted as employed individuals doing activities associated with the production of goods to sell and the rental of property.

The requirement that customers pay through the same platform used to connect workers with customers further restricted the CPS measure of DPE workers to workers where digital platforms provide at least some direct intermediation (triangular relationships). The CPS definition does not make any other restriction based on the type of intermediation platforms implement, while permitting platforms to have varying degrees of control over how workers are assigned work (algorithmically or not), the price customers are charged, and other forms of direct intermediation. This same requirement (that customers pay through the same platform) implies that workers conducting a job search online for non-DPE jobs (e.g. posting resumes online, reviewing online job postings or conducting online job interviews) and workers advertising for customers online on their own (e.g., using an electronic bulletin board such as Craigslist) are excluded from the CPS definition of DPE workers.

Workers conducting a job search online for non-DPE jobs (e.g., posting resumes online, reviewing online job postings or conducting online job interviews) and workers advertising for customers online on their own (e.g., using an electronic bulletin board such as Craigslist) are excluded from the CPS definition of DPE workers by the requirement that customers pay through the same platform used to connect to workers.

Figure 5.1. Implied conceptual scope for the BLS study



Key results

Based on the data collected through these questions, BLS released estimates about the number and characteristics of digital platform workers. Doing so, however, required modification of some of BLS's standard procedures. In particular, after extensive review of the collected data, BLS determined that the new questions did not work as intended and included a large number of incorrect "yes" answers. To eliminate these "false positives", BLS manually recoded answers using additional information collected in the CPS survey. This recoding reduced the number of "yes" answers by approximately two-thirds. BLS is confident that the recoded data provides a better picture of location-based and online web-based platforms workers. In the interest of transparency both the data as originally collected and recoded were released to the public.

BLS analysis of its recoded data indicates:

- In May 2017, there were 1.6 million digital platform workers in the United States, accounting for approximately 1% of total employment.
- Digital platform employment was fairly evenly divided between location-based and online web-based platforms. Location-based platform workers accounted for 0.6% of total employment, while online web-based platform workers accounted for 0.5% of total employment.
- Digital platform workers were slightly more likely to be men than women, reflecting the fact that, overall, a higher percentage of the employed in the United States were men.
- 17% of digital platform workers were Black, higher than their share of overall US employment (12%). By contrast, 75% of platform workers were White, slightly lower than their share of workers overall (79%). Hispanics made up 16% of platform workers, and Asians accounted for 6% of platform workers, close to their shares of total US employment.
- Black people were overrepresented among location-based platform workers (23%), while White people were overrepresented among online web-based platforms workers (84%).
- Digital platform workers were more likely than workers overall to work part-time. (Part-time workers are defined as those who usually work less than 35 hours per week at all jobs combined.)

Additional information about the characteristics of digital platform workers can be found on the BLS website https://www.bls.gov/cps/electronically-mediated-employment.htm. This website refers to digital platform

employment as “electronically-mediated-employment”; it also refers to “location-based” as “in person” and to “online web-based” as “online”.

Lessons learned

Based on a long-standing tradition, BLS does not use the names of companies in its survey questions, particularly in emerging or rapidly changing industries. BLS avoids the use of company names both to avoid focusing respondents on just a few, particular companies and to ensure that the questions are durable across time (or even between when the questions are developed and when they are fielded). To distinguish between people in various categories, BLS relies on asking questions about characteristics that distinguish the group of interest. This is the approach that was used with the DPE questions. However, due to other constraints, only 4 questions could be used to identify DPE workers.

Both the nature of platform work and the constraints of only having 4 questions contributed to the questions not working as intended. Specifically, the questions used in the CWS to identify location-based and online web-based platform workers were too complicated. Due to the length of the question, it appeared that at least some respondents did not hear the part of the question related to customers paying through the platform. The complexity of the questions also caused some respondents to focus on the examples, rather than on the characteristics of platform work embedded in the question. Additionally, if respondents hesitated, interviewers sometimes repeated only the examples.

Another issue with the questions, is that respondents interpreted them too broadly. This broad interpretation was related both to the widespread use of apps, computers, and websites by people in all types of work and to the complexity of the questions. This broad interpretation occurred for workers who were connected to customers through a website or app as part of their work but were not paid through it (such as customer service workers or fast-food preparers), workers who used mapping apps to obtain routing directions to customers (such as gravel deliverers) and workers who used computers as part of their work (such as receptionist who schedule medical appointments using a computer and university lecturers teaching online). Respondents with these broad interpretations appeared to have not heard the part of the question asking if customers paid through the same app or website that connected workers to them.[2]

Despite the difficulties with the questions, BLS will continue to use questions asking whether people have certain work characteristics associated with being platform workers to identify platform workers in the future. BLS will also not use the names of companies as it ensures the largest coverage at a point in time, is most likely to maintain durability of the measurement across time and provides the most flexibility for data users. Several do’s and don’ts have been learned about following this approach, however.

Table 5.1. Some lessons learned from the BLS study

Do	Do not
• Collect information on several characteristics that define platform workers and distinguish them from workers who just use the digital technology as part of their work	• Just rely on whether workers connect to customers via an app or website to identify workers as platform workers
• Ask about characteristics being used to establish a person as a platform worker in separate questions	• Combine several characteristics and examples into a single question
• If interested, ask about whether platform workers are location-based or online web-based as a single follow-up question after establishing workers are platform workers.	• Write a set of questions to identify location-based platform workers and a separate set of questions to identify online web-based platform workers.
• Collect sufficient information in the survey to verify whether digital platform workers are correctly identified (this can include the name of the platform workers used)	
• Test the questions on both those who are platform workers and those who are not. For the group who are not platform workers, include both those who perform similar tasks to platform workers and those who do not (e.g., workers who use computers or the internet as part of their work, but have work arrangements that are very different than platform workers)	• Only test the questions on platform workers or workers who perform tasks similar to platform workers
	• Only test the questions using online panels either non-probability (e.g., mTurk, and Qualtrics) or probability (e.g., Knowledgepanel)
• Monitor survey collection to determine if questions worked as intended	

Source: Eurostat and OECD based on US Bureau of Labour Statistics

Switzerland – Federal Statistical Office

Original purpose

In 2019, Switzerland conducted an LFS ad-hoc module on “internet-mediated platform work”. The main objective was to estimate the number of internet-mediated platform workers in the country, with additional questions on the reasons for this type of work, on how long the person has been providing these services, whether they take place as a main, second or additional job, the regularity and number of hours worked, the income generated, and the name of the platform or app. All types of services were considered (renting out accommodation, taxi services, sale of goods, and other services). The names of platforms or apps were mentioned as examples in the filter questions.

Reference population and sampling

The reference population of the module covered 15 to 89 year-olds from the permanent resident population. No specific sub-population was targeted and the questions were asked to all persons independently of their labour market status. The total annual sample of the module was around 12 000 persons which were chosen by random selection at the end of the first wave of the LFS (one-third of first wave, two-thirds being already moduled).

Other relevant survey features

In general, the questions on the internet-mediated platform services referred to the last 12 months preceding the interview. In order to have information on work done in the reference week, an additional question was used to find out if the person had provided one of the named services in the past week. All interviews were conducted in CATI.

Implied operational definition

In the Swiss module, every type of internet-mediated platform service was considered, including renting out accommodation via Airbnb or selling goods. Four filter questions allowed distinguishing between platform work in the narrower sense and platform services as a broader concept, including those selling goods and renting out accommodation. The following criteria had to be fulfilled for platform work or platform services:

Internet-mediated platform work:

- The person providing the service is connected to the client via an internet platform or app.

- Payment is usually made via the internet platform or app.

- The vast majority of the services provided consist of work (e.g. cleaning) and not of assets (e.g. renting out accommodation).

All areas of activity that can be processed via an internet platform or app are included, such as taxi services, cleaning, food delivery services, transport and delivery of goods, tradesperson services, programming, translation, data and text entry, and web and graphic design.

Other internet-mediated platform services:

Online rental of accommodation (rooms, apartments, and houses)

- The person providing the service is connected to the client via an internet platform or app.

- Payment is usually made via the internet platform or app.

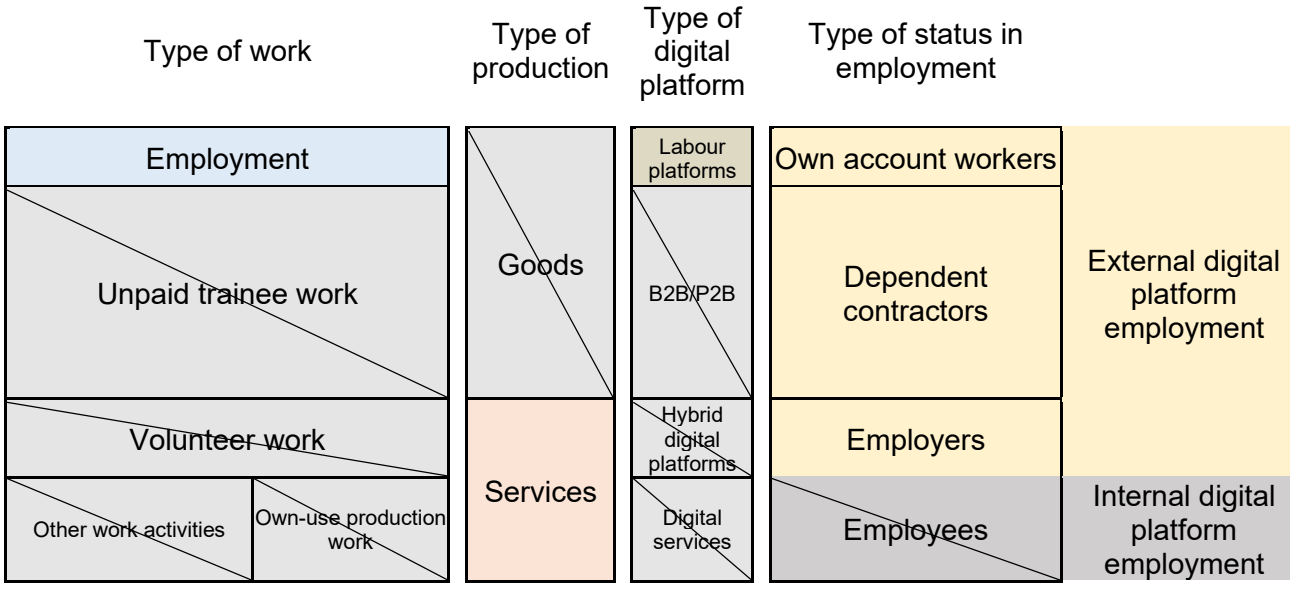
Online sales via an internet platform

- The person providing the service is connected to the client via an internet platform or app.

- The goods sold must have been deliberately collected, bought or produced for the purpose of resale.

- Payment is not usually made via the internet platform or app.

Figure 5.2. Implied conceptual scope for the FSO study



Key results

The analysis of the Swiss module showed that in 2019, 0.4% of the population said they had carried out work via internet-mediated platforms in the past 12 months (taxi services: 0.1%; other services such as programming, food delivery, cleaning, etc.: 0.3%). At 0.6%, a slightly larger percentage of the population had rented out accommodation through an internet platform, and 0.8% of the population had sold via an internet platform goods that were especially collected, purchased or produced with the aim of reselling them.

Lessons learned

As this form of work is not very common in Switzerland, it is difficult to collect data on these specific types of activities and to formulate questions in a way that reflects the conceptual issues at stake and that is understood correctly by the respondent. There was confusion between providing and using a service via a platform / app and consequently a certain number of "false positives". Plausibility checks based on the hours worked, income, named platform, reason for activity, but also the interviewers' comments were very important in the data production process.

Based on these first experiences, Switzerland reflected on potential improvements of questions. One suggestion would be to add, after a positive answer to the filter questions, a question on payment and commission:

> *-"Have you been paid / will you be paid for this service?" Answer categories: via the platform, app / by the client / won't be paid*
>
> *-"Does the internet platform / app take a commission for the service* you offer on it?" Answer categories: yes / no.*
>
> **renting out an accommodation / taxi services / sale of goods / other service*

A second suggestion concerns the sale of goods to better capture the persons who acquired goods with the specific aim of reselling them and to generate income. If the respondent says "yes" to the filter question on sales of good, there would be a follow-up question:

"Why did you sell these goods?" Answer categories: I didn't need them anymore / I collected, bought, or produced them with the specific aim of reselling them

These additional check questions would help to exclude a significant number of false positives, i.e. persons answering "no" to payment and commission; and persons selling goods because they didn't need them anymore.

Chile – National Statistics Institute

Original purpose

Since January 2020, the National Employment Survey (ENE, Spanish acronym) has incorporated a new series of updates in order to strengthen its production process and more accurately reflect the national labour market. These improvements include expanding the questionnaire to include new dimensions of analysis in order to capture new trends in the Chilean labour market.

Through these processes, the ENE began to capture, measure, and analyse employment work that uses mobile applications or digital platforms. This kind of work is a recent phenomenon that has been growing at an accelerated pace throughout the world, and it grew further during the COVID-19 pandemic. Thus, National Statistics Institute (INE, Spanish acronym) can provide information for more research into the nature and trends of employment work in Chile, enabling a response to such questions as "How many people are employed in work obtained through the use of digital platforms?", "What are their demographic characteristics?", "In which economic sectors are these workers employed?", "What is the status of the population employed on digital platform work?", "How do such workers access social welfare benefits?", and "Which platforms did they use to obtain work?"

Reference population

The ENE of the INE is the principal survey on the labour force in Chile, and it has publishable information since 1986 to date. The ENE is aligned with the recommendations of the International Conference of Labour Statisticians of the International Labour Organization. The universe of the ENE consists of all persons who reside in occupied private dwellings within the national territory and who are covered by the sampling frame of the survey called MMV 2017.[3] Within this universe, the target population of the ENE is defined as the working-age population (i.e., all persons aged fifteen and over) who habitually reside in occupied private households in Chile.

The universe of the National Employment Survey (ENE) consists of all persons who reside in occupied private dwellings within the national territory and who are covered by the sampling frame of the survey called MMV 2017.[4] Within this universe, the target population of the ENE is defined as the working-age population (i.e., all persons aged fifteen and over) who habitually reside in occupied private households in Chile.

Sample dimension

Because the digital platform work continues to be a phenomenon in constant change and development, information on as many workers as possible should be captured. For this reason, the question on work obtained through digital platforms in the main activity[5] is directed to all occupied persons, except for persons classified as "Contributing family workers" in consideration of the nature of such work. Information on work obtained through digital platforms is also studied among workers who state that they engage in a secondary activity, in order to describe such activities.

Other relevant survey features

The ENE sample is spread over three months, constituting moving quarters, and it is then divided into subsamples that are repeated every three months for a maximum period of one and a half years (six rounds of visits). Thus, the ENE captures information for each monthly sub-sample, but it processes, analyses, and publishes information for moving quarters (INE, 2021[1]).

The information is collected on a mobile capture device (i.e., by CAPI[6]) in an application designed especially for the ENE. In addition, information is gathered through a mixed methodology that includes face-to-face interviews and telephone surveys.

Implied operational definition

The ENE defines digital platform work as follows: "work that uses a mobile application or digital platform to offer goods or services by exclusively or predominantly using media that involve remote contact with customers, either through the internet (digital platform) or by cell phone (mobile application)" (INE, 2022[2]). In short, platform workers are those who use a digital platform or mobile application to mediate a service or exchange goods.

Because expert international organisations have not yet officially defined this recent and rapidly developing phenomenon, which has a strong impact on employment, published statistics are considered experimental within the framework of the labour market statistics published by INE. The questions included in the ENE questionnaire to capture digital platform work are the following:

Table 5.2. Questions relative to digital platforms work

Employed persons	Employed persons with secondary activity
F2 Does the person obtain their work through the use of a mobile application or web platform? *A mobile application or digital platform is any computer application that allows a person to perform a varied set of tasks associated with the sale of goods or services. It should be recorded only when it is used predominantly or exclusively for this work. Do not include generic names such as internet, website, intranet, software, or similar names.* 1 Yes. Which one? 2 No 88 Not sure 99 No response	G4 Does the person obtain the work of their second occupation through the use of a mobile application or web platform? *A mobile application or digital platform is any computer application that allows a person to perform a varied set of tasks associated with the sale of goods or services. It should be recorded only when it is used predominantly or exclusively for this work. Do not include generic names such as internet, website, intranet, software, or similar names.* 1 Yes. Which one? 2 No 88 Not sure 99 No response

Source: National Statistics Institute of Chile, ENE (INE, 2022[2]), *Separata técnica n°4: Nuevas dimensiones de análisis*.

The structure of the questions is as follows: first, the interviewer asks a dichotomous question on whether this type of technological tool is used while permitting partial response. Next, if affirmative, the interviewer asks the name of the digital platform, "Which one?". However, the fields intended to identify the digital platform do not have any type of validation during the collection process, thus the open nature of the question may result in errors in the information provided by the respondent. Therefore, the response is subject to cleaning, validation, and imputation.

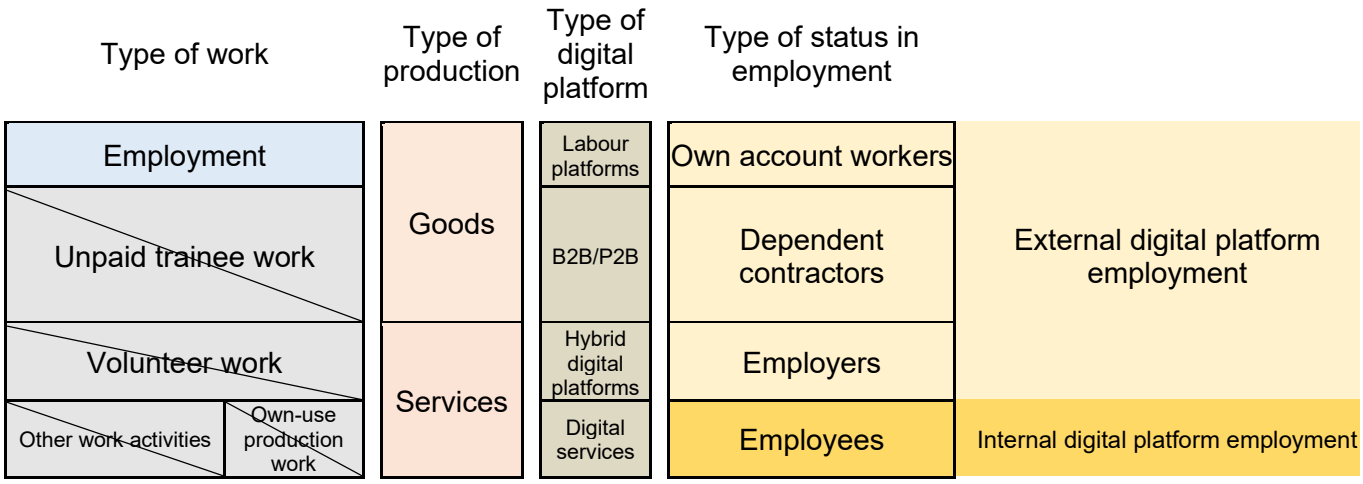
Once available, the information on the mobile application or digital platform is cleaned. This process consists of standardizing the open text record and eliminating texts determined to be "erroneous". These texts include names of digital platforms that do not meet the accepted definition of digital platform work. After the texts are cleaned, only those persons who replied with "valid" texts are included in the estimation. To define a text as valid, a dictionary of digital platforms was created after an exhaustive review of the

digital platforms in Chile. The dictionary is constantly being updated in order to reflect the evolution of digital platforms.

After, the question of digital platform work in main activity will be imputed according to the description of the question on employment and activity. This procedure consists of reviewing the text to identify the occupational group, the activity of the company, and the name of the company that pays the person's income, searching in the descriptions of these questions when the employed person states that they obtain work through one of the following mobile applications: *Uber, Cabify, Didi, Beat, Cornershop, Rappi, Uber Eats, or Pedidos Ya*[7]. The final variable is published in the database called "*plataformas_digitales*". The value of the variable is 1 if it represents those who actually have a digital platform work in their primary occupation. The variable "*pd_especifique*" represents in which digital platform work. After the process, the variables on secondary occupations of digital platform work, are published as "*sda_pd*" and "*sda_pd_especifique*".

Consequently, we can observe that the conceptual scope of the questions of digital platforms work can be classified by type of production, type of digital platform or by employment status. This can be seen in Figure 5.3.

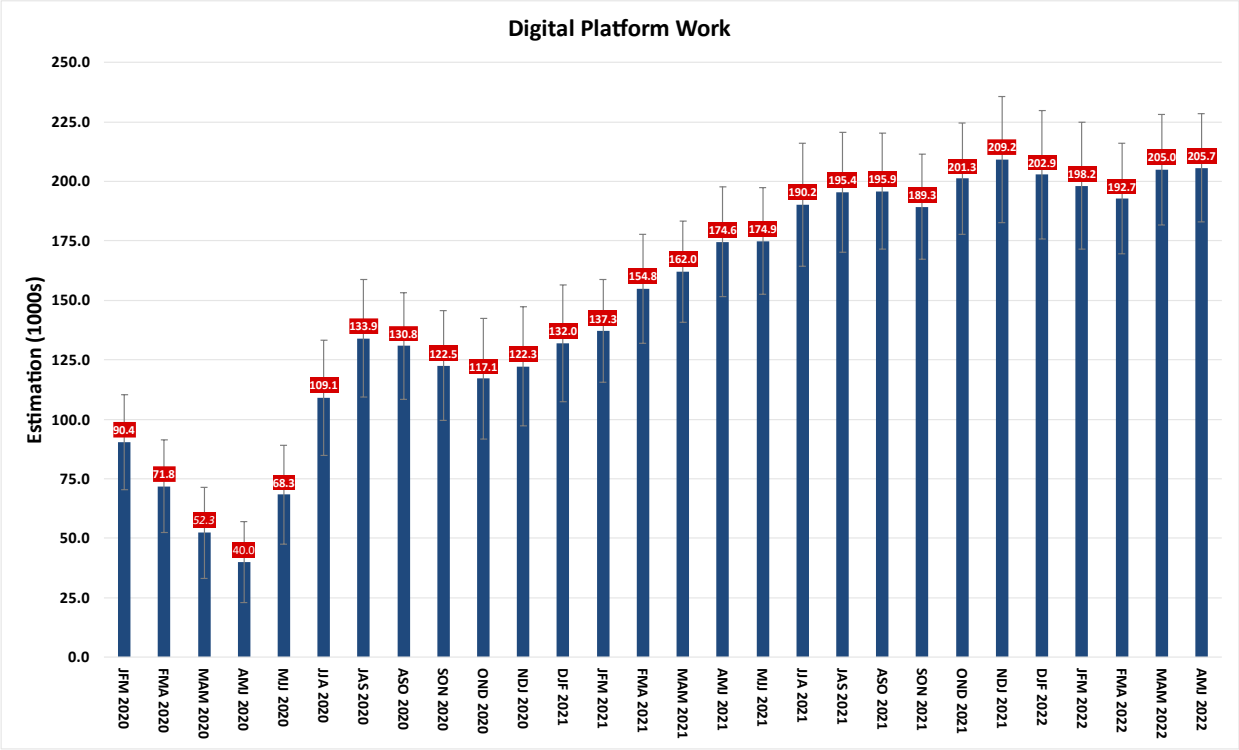
Figure 5.3. Implied conceptual scope for the NSI study



Obtained goals and lessons learned

For the moving quarter April-May-June Q2 2022, it is estimated that there were 205 741 employed persons working on their main activity on digital platforms, which represents 2.3% of the total employed population[8]. Of these 205 741 employed persons, 31 376 were foreign nationals, or 15.3% of the total number of employed persons on digital platform work.

Figure 5.4. Employed people on digital platform Q1 2020-Q2 2022

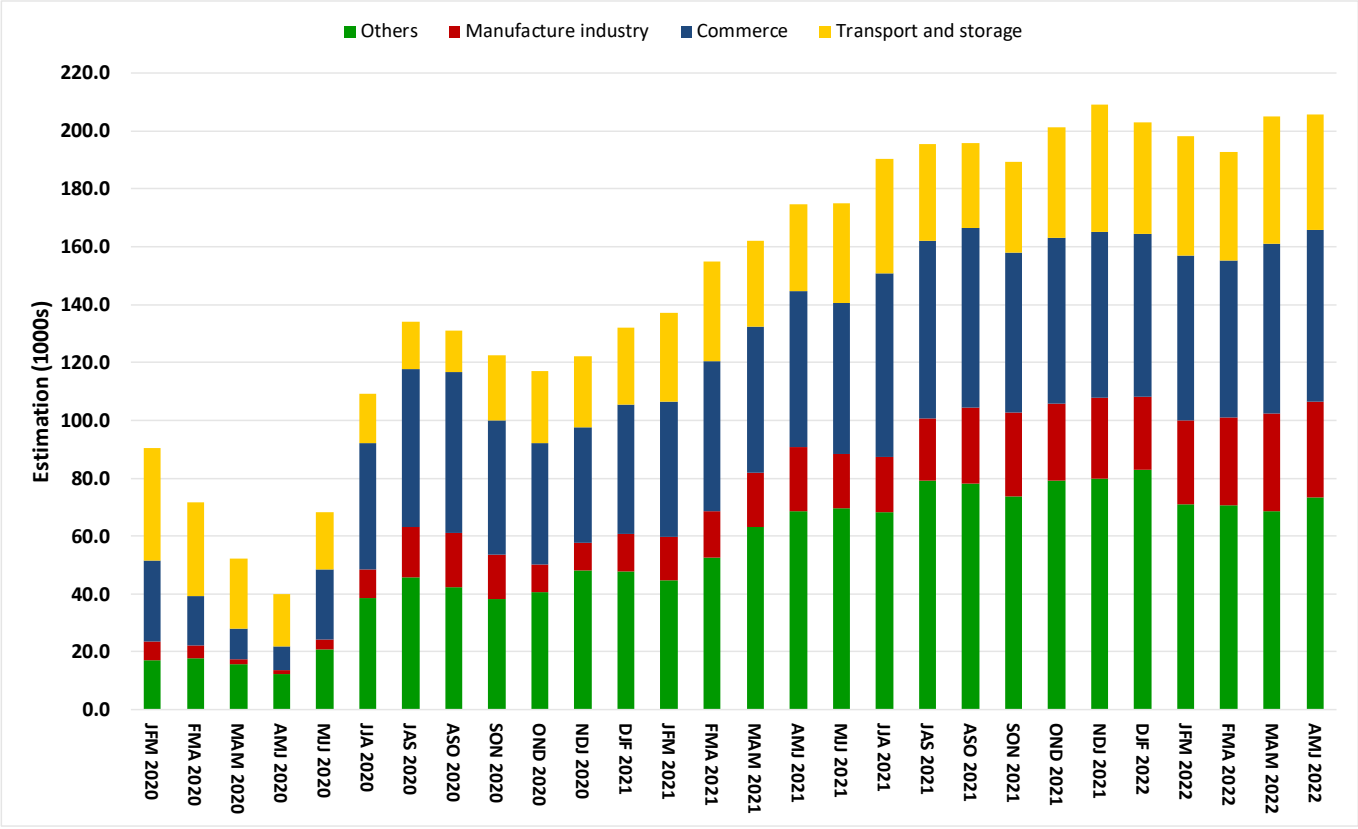


Source: National Statistics Institute of Chile, ENE (INE, 2022[2]), *Separata técnica n°4: Nuevas dimensiones de análisis*.

Breaking down statistics by gender, there were 108 630 employed men who work on digital platform, which represents 2.1% of the total number of employed men and 52.8% of the employees on digital platform. In contrast, an estimated 97 111 employed women obtained work on digital platforms, which represents 2.6% of the total number of employed women and 47.2% of the employees on digital platform. For the last moving quarter for which data is available (April–June 2022), 5.3% of the informally work on digital platforms, which amounts to 126,441 persons. In contrast, 1.2% of the formally employed population work on digital platform (45 027 persons). Also, most platform workers are independent (78.1% of digital platform workers that represents 160 713 persons).

When disaggregated by economic activity, the estimate of employed persons who works on digital platform shows that “wholesale and retail commerce”, represented 28.8% of platform workers. For this group, the following platforms and applications were the most prevalent: *Facebook, Instagram, and Whatsapp*. Following is “transport and storage”, which includes vehicle drivers, and it makes up 19.5% of platform workers (40 025 persons) during the period. For this group, the application *Uber* is the most important. Finally, 33 130 persons were categorised as working in “manufacturing”, which represents 16.1% of platform workers. The activities of this group include the manufacture of textiles and the processing of some food and personal care products.

Figure 5.5. Digital platform work by economic activity Q1 2020-Q2 2022



Source: National Statistics Institute of Chile, ENE (INE, 2022[2]), *Separata técnica n°4: Nuevas dimensiones de análisis*.

In Chile, Law 21.431, about digital platform work, was enacted in March 2022, and it comes into force on September 2022. This one establishes norms and it regulates the relationship between platform workers (both dependent and independent) and the digital platform company. The Law defines what is to be understood as a digital platform company and digital platform worker. It describes the type of employment contract between dependent and independent digital platform workers, specifying the employer's duty to protect workers, to normalize working hours and remuneration or fees, and respect platform workers' right to access social welfare benefits and their right to disconnection among other contractual obligations.

The law is narrower in its definition of digital platform work than ENE's definition, and therefore information based on the law constitutes a subset of what is captured in the survey. ENE estimate employed persons, and the resulting figures may therefore differ from the number of jobs available on digital platforms because a worker may be registered on more than one platform at the same time. The measurement of the number of digital platform workers has been important in approximating the number of persons who will be affected by the law upon its implementation. The ability to characterise this subgroup of employed persons has provided a framework for the application of Law 21.431, and it has enabled the monitoring of the evolution of the characteristics and working conditions of this subgroup over time.

Finally, the analysis and monitoring of the employed population on digital platform is a new topic in labour force surveys, and information on this subgroup is frequently requested. The ENE has incorporated the observation of this subgroup since 2020 by using a data processing methodology based on text mining, which allows validating and cleaning data according to the definition of a dictionary of digital platforms.

These estimates are defined as **experimental statistics** because they still show room for improvement, and they have not yet achieved sufficient maturity to be included in the list of official statistics. It should be

noted that for the last moving quarter for which data is available (Q2 2022), the total number of employed persons on digital platform reached 205,740 persons, equivalent to 2.3% of the total employed population.

Manpower Research and Statistics Department, Singapore

Original purpose

Singapore's Labour Force Supplementary Survey on Own Account Workers provides data on the prevalence of own account workers[9] engaged in online platform work. Dedicated questions in the supplementary survey allow examining the demographic profile of own account workers engaged in online platform work, the occupations they worked in and, the types of online matching platforms used. Beyond this, the survey also seeks to understand the motivations for taking on platform work, whether the workers involved were doing this as their main job or on the side, and the challenges they faced.

Reference population and sampling

The module considered here is a supplement to the Comprehensive Labour Force Survey, which covers all private households in Singapore. The survey sample is selected based on a stratified random design with proportional allocation.

All respondents aged 15 years and over who indicated in the Comprehensive Labour Force Survey that they did own account work in the past year were questioned through the supplementary survey, which asks for detailed information on their experiences in own account work and whether online matching platforms were utilised. Approximately 4 200 persons responded to this supplementary survey, with results grossed up to the resident population using multiple estimation factors. The use of a random sampling methodology and a high response rate of at least 85% help ensure that findings are representative of the general population.

Other relevant survey features

The reference period of a year is used to enable a more accurate sensing of the prevalence of own account and platform work, given the ad-hoc and transient nature of such work arrangements. Survey responses were mainly collected through internet submissions or telephone interviews. Where needed, face-to-face interviews were also conducted.

Implied operational definition

Platform workers in Singapore's context refer to own account workers who provided paid labour services via online matching platforms. Such labour sharing platforms serve as intermediaries to match or connect buyers with workers who take up piecemeal or assignment-based work. These platforms could be either websites or mobile applications, covering services such as ride-hailing, goods/food delivery, creative work etc. Other types of platforms (e.g. capital-sharing or e-commerce platforms) are not included, as labour is not the main traded good in those cases.

Notwithstanding this, the survey separately captures a wider measure of own account workers who utilised any online channels to obtain business. Besides the aforementioned online matching platforms, this include (but not limited to) the use of e-commerce websites and social media platforms.

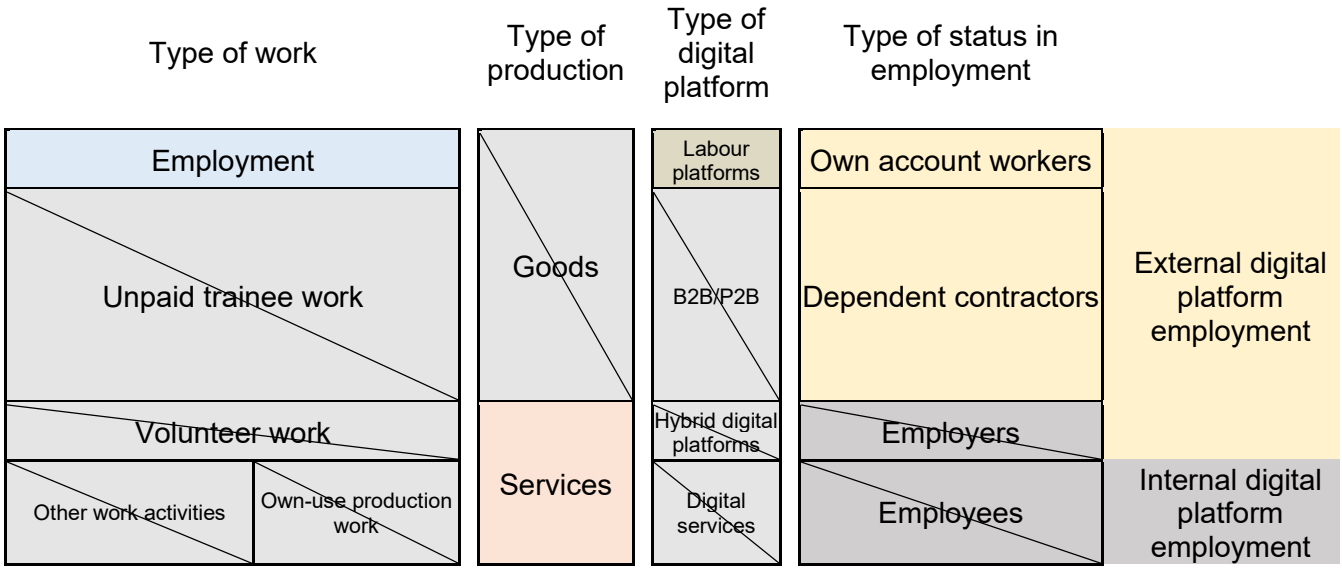
Some platform workers could be doing such work for their livelihood, while others do platform work on the side, e.g. multiple job holders with a full-time employee job, students, homemakers and retirees. Such a differentiation provides better insights to aid in more targeted policy interventions.

Singapore adopts the same definition of "employment" as that stipulated in the ILO resolution[10] During the reference period, employed persons either (i) worked for one hour or more either for pay or profit; or (ii)

have a job or business to return to but are temporarily absent because of illness, injury, breakdown of machinery at workplace, labour management dispute or other reasons.

To address the sporadic nature of own account or digital platform work, Singapore's survey used a longer reference period of a year. In addition, the survey sieves out persons who did such work on a regular basis during the year, as such persons likely have higher work attachment.

Figure 5.6. Implied conceptual scope for Manpower Research and Statistics Department, Singapore study



Key results

The survey enabled a better understanding on the prevalence and nature of platform work in Singapore. At the most general level, the data show that, despite the emergence of online matching platforms, own account work has not displaced regular employment. The percentage engaged in own account work has remained fairly stable, at about 8% to 10% of all employed residents over the last decade.

With respect to digital platform employment per se, the latest 2020 survey found that about 3% or 73 500 of Singapore's resident workforce was engaged in platform work as their primary job in the year. They were mainly involved in the transportation of goods and passengers. The majority engaged in platform work by choice, because of the flexibility and freedom they enjoy.

The top occupations in platform work were private-hire car drivers, taxi drivers, and car and light goods vehicle drivers. Work arrangements of platform workers can resemble those of employees. Platform companies often set the price of their product, determine the assignment of jobs to workers, and manage how the workers perform, including imposing penalties and suspensions.

Lessons learned

Platform workers' contracts with platform companies are not employer-employee contract of services. This means platform workers do not have the statutory provisions that employees have, such as work injury compensation, union representation and mandatory social security contributions made by the employer. Because of this, the government is looking into strengthening protections for platform workers, specifically delivery workers, private-hire car drivers and taxi drivers, and ensuring a more balanced relationship

between intermediary platform companies and platform workers. Singapore's Prime Minister announced at the 2021 National Day Rally that an Advisory Committee will be convened to study this issue.

European Commission – Eurostat

Original purpose

In 2019 Eurostat launched a Task Force on Digital Platform Employment (DPE), with the purpose to answer to the increasing pressure for comparable information on gig/collaborative economy. Statistical measurement are of paramount importance to design informed policies and the main stakeholders are precisely the policy Directorates General of the European Commission. One of the goals provided in the Political guidelines for the European Commission 2019-2024, presented by President von der Leyen, is "improving the labour conditions of platform workers notably by focusing on skills and education". EU-action is recognised as necessary in order to protect platform workers and reduce the risk of regulatory fragmentation across Member states.

The Task Force mandate has included the development of technical and methodological elements plus a set of variables/questions, which have been piloted in the EU-LFS within 2022 by the volunteered Member States to evaluate the results of this pilot exercise and to come with a revised proposal, in view of a full implementation in the EU-LFS. The pilot survey on DPE is ongoing and no results are available at present, but 2023 results will be used in terms of developing the final EU-LFS framework for the measurement, including the definitions of the phenomena. The implementation of DPE module within the EU-LFS for regular production depends on the pilot survey results and the final discussion taken by the Eurostat LAMAS LFS Working Group.

The technical/methodological proposal includes: defining the objective of the information to be collected, for example capturing additional persons in employment (as first or second job) who find work through platforms and/or having an overall number of platform workers; defining the labour market characteristics of interest of these platform workers: working conditions, professional status, quality of the work, required skills, etc.; defining the target phenomena (what are platform works? which platforms?); defining the reference population and the reference period.

Reference population and sampling

The reference population is all population within 15 and 64 years old, with respect to the population of the EU-LFS all persons aged 65 and more are excluded. Constraints to the survey are imposed by the EU-LFS nature. The focus should be on:

- the supply side of the labour market;
- the activities constituting employment (work for pay or profit, for more than one hour in a reference week);
- the counting of heads (not transactions, volumes or revenue);
- the activities where a website or an app plays an integral role in connecting workers to customers.

The main challenges are two: to identify the platform work within the employed people already detected in the LFS (as part of first or second job) and to identify employed people non-detected in the LFS who actually perform paid platform work.

The Task Force suggests that the pilot is asked to a sub-sample of the standard LFS (with the indication to be placed at the end of the questionnaire in order not to interfere in any way with the results of the current LFS). Dimension of the sub-sample should be at least, in each quarter of 2022, 1/10th of the national quarterly sample, in order to provide significant figures on the small phenomenon of the DPE. The information on actual sample size is not yet available when writing this Handbook.

Other relevant survey features

All features of the survey should be identical, or as similar as possible, to those of the EU-LFS, in order to produce comparable results.

Implied operational definition

The first step is to define "employment" in the context of DPE. This definition should remain into the LFS framework, implying that "employment" refers to the usual criteria: at least one hour of work for pay or profit in a reference week. Nevertheless, since the time horizon of a survey on DPE, being the DPE a rare phenomenon at the moment, cannot be the single LFS reference week, it has been decided to somehow extend the reference period of the pilot: the first set of questions refers to the last 12 months ending with the reference week of the LFS. Once the number of the DPE workers has been estimated the following sets of questions, on their characteristics, refer to the last month and to the reference week in order to make the link with the core LFS.

Consequently, the criteria for defining "employment" in the context of DPE is proposed to be:

> *To have worked for pay or profit in tasks/activities organised through an internet platform or a phone app, for at least one hour in at least one week, during the reference period.*

Persons with very short spells of DPE work, specifically never spending more than one hour in one week for one year on paid work, are excluded, it may be the case of some micro-task workers. This should be a very rare phenomenon and its loss is compensated by the comparison advantage to link with the LFS definition of employment. Moreover this definition, while sticking on the LFS standard, enlarges the reference period to have more robust estimation.

Any task/activity that can be considered as "employment" in the LFS, i.e. production of goods or provision of services but also time spent in searching for clients or in setting up the working activity, should be considered as DPE when the other criteria are fulfilled. It includes in particular, work for pay and profit (1) for providing taxi or transport services including driving clients, delivery of food for restaurants, or transport or delivery of any kind of goods or similar, (2) for providing actual services in view of renting out a house, a room or any other accommodation, (3) for selling any good produced or bought with the intention of selling it online, and (4) for providing other kinds of services or work, among others: cleaning, handiwork, programming and coding, online support or checks for online content, translation, data or text entry, web or graphic design, medical services, creating contents such as videos or texts (with the purpose of earning money or other benefits).

For all tasks/activities listed here above, as far as the matching between the provider and the client is done throughout an internet platform or a phone app, the task/activity can be considered as DPE.

Concerning the definition of a "platform", the OECD approach (based on work from the European Commission and others, used in its publication of March 2019 'Measuring the digital transformation: a roadmap for the future') is followed:

> *An online platform is a digital service that facilitates interactions between two or more distinct but interdependent sets of users (whether firms of individuals) who interact through the service via the internet*

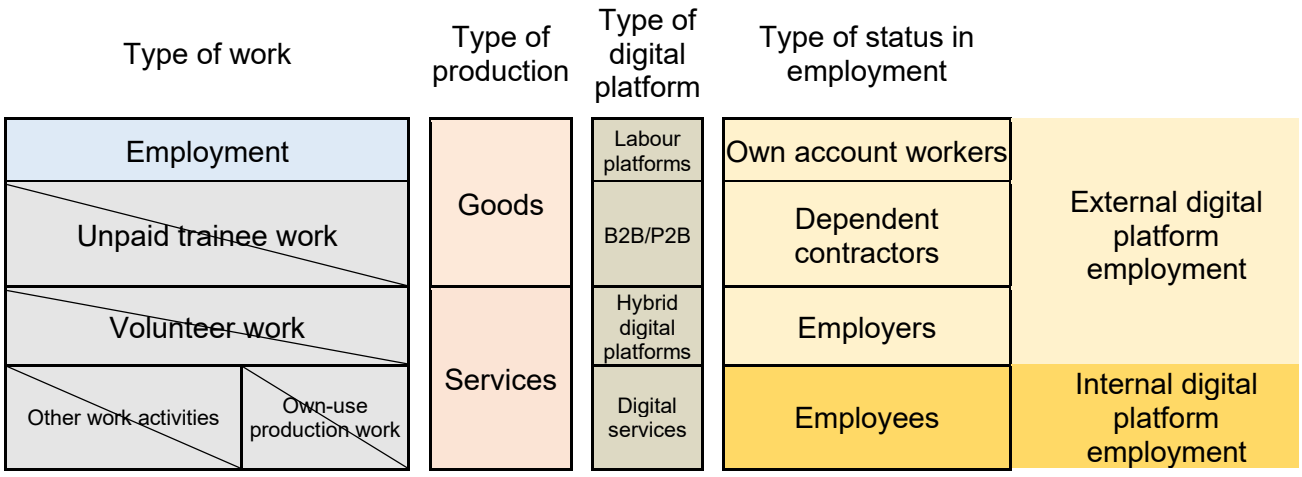
Then, to define a work organised through a digital platform is necessary. It has been decided to take into consideration only work organisations involving three separate agents. On the vertex of the triangle are the three agents:

- The provider, in this context this is the supply side of the labour market and it is our target (the employed person);

- The client, in this context this is the demand side of the labour market (it may be an individual or a legal person);
- The platform: an internet platform or a phone app with the purpose to facilitate the match between the provider and the client.

It is important that the three agents are distinct. If the platform and the provider coincide, for example if the provider owns the platform like a producer that sells its goods on its own website, this is not anymore a triangular work organisation and the work cannot be classified as a DPE. Another example is the case in which the client and the platform coincide, the provider works through the platform owned by the client, as in case of teleworking. Again, this cannot be classified as DPE. Both examples show standard two agents relationships, while we are interested in new situations in which the market is characterised by the presence of a third agent. This can result in a smoother market where the platform plays a facilitation role in the matching of supply and demand, but also in market perturbed by the dominant position of the platform.

Figure 5.7. Implied conceptual scope for Eurostat study



It is also important that all three sides of the triangle represent an actual connection between vertexes. If the provider has no relationship with the client but only with (receive instructions, get paid, report to, etc.) the platform and the client also has only relationships (a commercial contract or other) with the platform, then there are two different traditional two-agent relationship instead of a triangular one. The decisions taken may exclude some kind of bilateral DPE, and this endanger the identification of some DPE workers in an employee position, but their number has been considered small with respect the high risk to improperly include many people simply in telework.

It has to be noted that for classifying a respondent in employment or not, the focus should be on the provider (i.e. the respondent); characteristics of the platform and of the client should not be taken into consideration. As far as the provider works for pay or profit, there is employment. Platform and client can be based in the country of interest or not, they can be individual or legal entities, etc. The provider must be resident in the country of interest and must be a person to be counted as “employed” or “not employed”.

Obtained goals and learned lessons

The obtained goals, for the moments, cover only the set-up of the survey: the definitions and the way to include it in the regular LFS. No figures are currently available.

Information and Communications Technology (ICT) use survey

The 'use of ICT' survey is a household, or individual, survey aimed to investigate the diffusion and the trends in usage of new technologies such as the Internet or tools such as computers[11]. Information needs to be covered are, among others:

- access to and use of ICTs (including tools: computers, mobile phones, others)
- use of the internet and other electronic networks for different purposes (e-commerce for example),
- ICT security and trust,
- ICT competence and skills.

Focusing on the individuals it covers the supply side, the DPE worker point of view, and the client side, when the client are individuals, such in case of food delivery or taxi services. It may be difficult to distinguish the provider and the client, both answering that they use the platforms. Survey designers should put attention on clearly wording the questions, especially when the data collection mode is web based, with no help from an interviewer. A section on DPE should be explicitly provided and *ad-hoc* designed, among the other information sections of the survey.

It can cover the DPE not covered by the LFS, for example for very occasional providers, which do not even consider themselves as in employment, and can be useful to investigate particular aspects such as the skills of the providers and details on time spent on the platforms.

Canadian Internet Use Survey - Statistics Canada

Original purpose

The 2018 and 2020 Canadian Internet Use Survey (CIUS) covered digital labour platform work through its module on online work. Among other things, the module aimed to capture participation, activities and money earned from online work. There was the possibility of getting some information on the features of the platform workers through questions on education, Aboriginal identify, and other labour market activities.

In CIUS 2018, a filter question asked about whether the respondent had used the Internet to earn income in the previous 12 months. For those who did, a follow-up question asked about whether the income earned was the main source of income or an additional source of income. Finally, a third question asked the method through which the income was earned, with respondents having to choose between seven categories. Each category included examples of platforms used for earning income online.

The full list of the methods to earn money on the internet were the following:

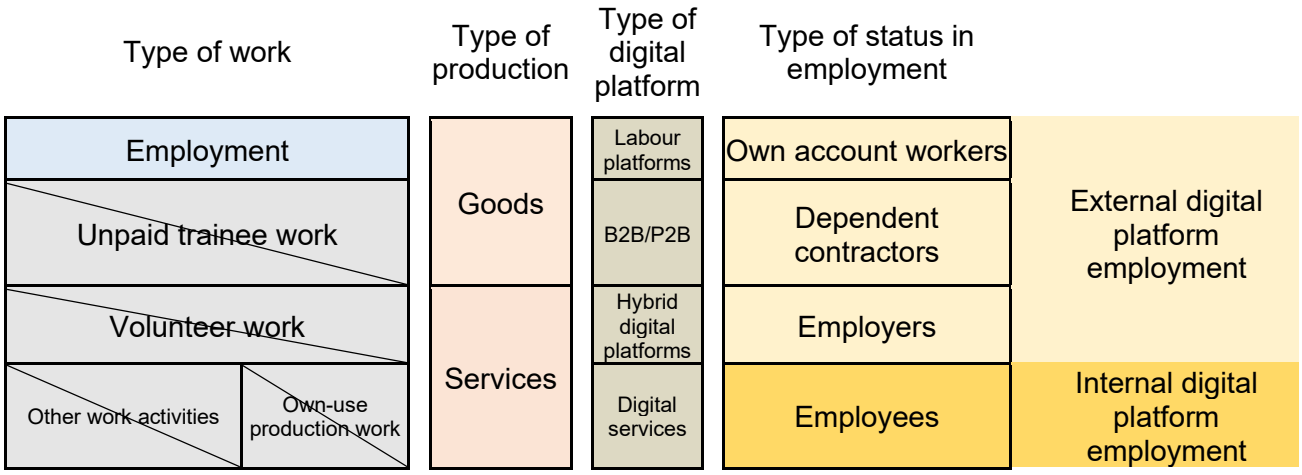
- online bulletin board for physical goods (e.g., Etsy, Kijiji, Ebay);
- online bulletin board for services (e.g., Kijiji, Craigslist);
- platform-based peer-to-peer services (e.g., Uber, Airbnb, AskforTask);
- online freelancing (e.g., Upwork, Freelancer, Catalant, Proz, Fiverr);
- crowd-based microwork (e.g., Amazon Mechanical Turk, Cloudflower);
- advertisement-based income (e.g., income earned through YouTube or personal blogs);
- other.

In 2020, the questions about activities to earn money online were asked differently, with each type of activities presented as a separate question. Nine types of activities done online to earn money were presented, compared to seven in 2018.[12]

Reference population and sampling

The target population of the CIUS was all persons 15 years of age and older living in the ten provinces of Canada. It excluded full-time residents of institutions.

Figure 5.8. Implied conceptual scope for Statistics Canada study



The sample was based on a stratified design employing probability sampling. The stratification was done at the province level. The survey used a two-stage sampling design. The sampling units were telephone numbers grouped and linked to the same address. The final stage units were individuals within the identified households.

Information was collected from one randomly selected household member aged 15 or older, and proxy responses was not permitted.

In 2018, a field sample of approximatively 33 000 units was used on the basis of an expected response rate of about 50%. The size of the sample was chosen based on the requirements to report survey results by key socio-demographic groups, e.g. province. In 2020, the sample was increased to 44 800.

Other relevant survey features

The data collection method was web-based, with follow-ups for non-response by phone.

Implied operational definition

The concept of online work in CIUS was not limited to specific types of digital platforms. Bulletin boards (e.g. Kijiji, Etsy) were included, as well as social media (e.g. YouTube) and more capital-intensive labour platforms (e.g. Uber, AirBnb).

In addition to including categories about selling services, CIUS included one category specifically about selling goods online, with no explicit mention about whether goods sold were used or new. In 2020, for example, the category related to selling goods was restricted to “physical goods that you built or created”, which likely led some respondents to exclude ‘used goods’.

Questions on online work were asked to all respondents, i.e. internet users, irrespective of their employment status. In the 2018 CIUS, definitions were provided for some concepts, including online bulletin board, platform-based peer-to-peer services and platform. These definitions were not provided in the 2020 version. Labour platform work was measured through participation in any of the money-earning online activities listed in the questionnaire.

Obtained goals and learned lessons

In 2018, the concept of using the Internet to earn income may have been measured inaccurately due to question wording and questionnaire flows. The filter question asked whether a respondent used the Internet to earn income. Respondents could have been interpreted this as solely online work, and not thought of Internet as a facilitator, to organise and receive payments for services (i.e. platform-based peer-to-peer services), particularly on-location services. This may have caused an underrepresentation of peer-to-peer service workers in the CIUS.

As well, the "include" statement ("Include money made through online bulletin boards") in the filter question was the only include statement for the question. It is possible that after reading the statement, some respondents may have not thought about all of the other methods of earning money online.

Finally, the question on whether income earned online was the main source of income was only asked when a respondent said 'yes' to earning income online. Without clicking yes to the filter question, respondents may have thought of "income" as a sole money source and deterred people from thinking about minimal amounts earned online.

Business surveys

Business surveys can provide information on the labour market from the demand side. Usually the sampling units are enterprises, although not always all the enterprises of a country are in reference population. Enterprises can include digital platforms (or a digital platform can be part of their core business) or businesses that are clients of platforms.

In both cases this data source typically identify economic units that relies on digital platforms, this kind of entities are more in relation to the OECD concept of digital economy, as discussed in Chapter 2, even if they can also provide information on digital work if asked about their providers. Moreover, if for example sole traders are included then business surveys could be used to also get a direct estimate of part of the digital platform employment.

If the aim is to survey platforms then a register of platforms should be available to build the sample, but this is not always the case: such a register is not yet common in most countries and constructing it presents several difficulties, such as the cross-border feature of many platforms. It is much easier to collect information on business as clients, those who demand the labour factor to the platform. Business surveys can also be used to collect information on existing (and operating in the country) platforms, with the purpose of building the platforms register.

The French statistical office (INSEE) has included some questions on use of platforms into its existing business survey. These questions aimed to cover both business clients and platforms themselves, with no clear distinction between them.

France – INSEE

Original purpose

Every 4 years, INSEE conducts a three-wave survey (called "SINE") on a sample of newly created or reactivated enterprises. For each sample, information is collected at three moments of company's life:

- a few months after its creation;
- at the end of the third year of existence;
- five years after its creation.

The questionnaire deals with:

- the profile of the creator and the conditions for the start-up of the enterprise;
- the development of the enterprise's activity, its type of clientele, its co-operation with other enterprises;
- changes to employee numbers (hiring, dismissals, occasional staff);
- investments and their form of financing;
- training and advice after start-up;
- the difficulties encountered by the enterprise;
- the enterprise's strategy;
- the conditions for its development.

Since 2018, all waves of SINE have included questions on the use of DP. In 2018 (first wave of enterprises created in 2018), respondents were asked whether they were working with DP in the first year of activity and, in this case, whether it was the company's main source of turnover. The main objective of these questions was to estimate the number of new enterprises working with DP and how important such platform was for their income.[13]

All types of services and all kinds of platforms were considered, the names of the platforms were not asked. Some examples were given in brackets (ride-sharing services, home delivery, personal services, business services or consulting) to help respondents.

More recently, additional questions about DP were added in the 2021 survey, concerning all types of companies ("auto entrepreneur", sole proprietorship, and other company) started in 2018 and interviewed 3 years after their creation. This survey is still in progress. These questions ask about satisfaction in terms of income generate, terms of contract, access to the market provided by the DP, and freedom in the organisation of work (hours, subordination, etc.).

Reference population and sampling

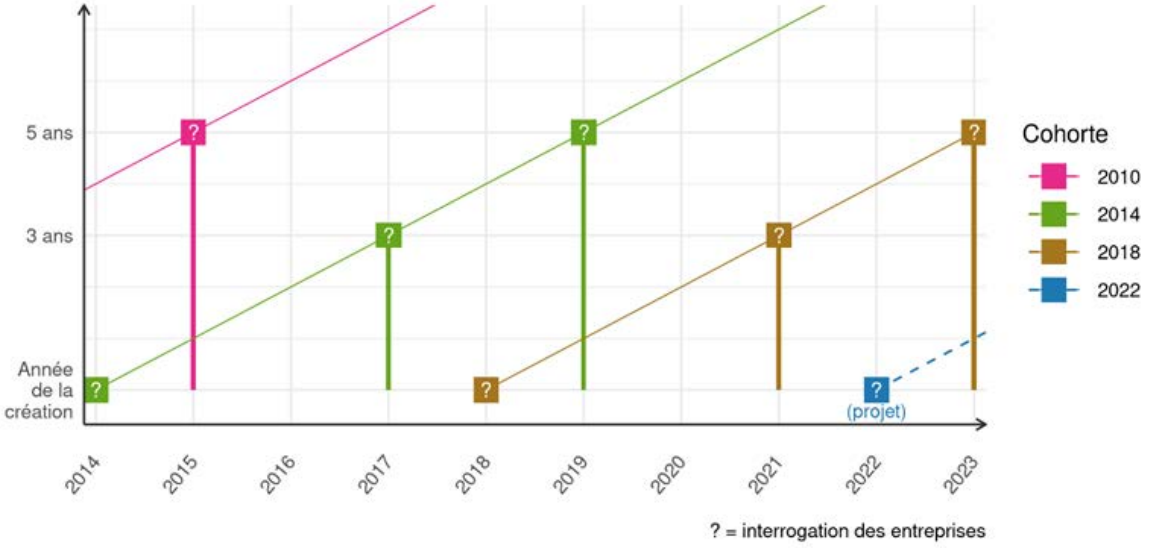
The reference population of SINE covers all the entrepreneurs who created or reactivated their enterprise (excluding agricultural activities) during the 1st semester of the survey year. Stratified random sampling was used, with the reference population stratified by type of enterprise (natural person or legal entity), regions (NUTS level 1) and economic sectors (NACE level 1).

The size of samples was determined to estimate the longevity of the enterprises with enough accuracy five years after creation. The sample for the 2014 survey covered 40 000 entrepreneurs and 40 000 "auto entrepreneurs" who created their enterprise during the first semester of 2014, which corresponds to a sampling rate of 32%. The sample for the 2018 survey covered 24 000 entrepreneurs and 56 000 "auto entrepreneurs" who created their enterprise during the first semester of 2018. This sample of 80 000 enterprises corresponds to a sampling rate of 24 % among the enterprises created in the first semester of the year. For the next cohort (2022), it is planned to sample between 34 000 and 40 000 enterprises of each type (auto-entrepreneurs and others).

Other relevant survey features

The SINE survey programme was launched in 1994. Until now, six generations of start-ups have been observed: 1994, 1998, 2002, 2006, 2010, and 2014. From 2010, the survey incorporates "auto entrepreneurs". The seventh generation, 2018, is currently being sampled.

Figure 5.9. SINE (New enterprises information system) survey pattern



Source: INSEE, Système d'Information sur les Nouvelles Entreprises, https://www.insee.fr/fr/information/2044890.

Questions about DP were first introduced in both questionnaires in 2018; these questions were then added in the "auto entrepreneur" questionnaire of the third wave of the survey concerning firms created in 2014 and observed (in 2019) five years after set-up. The questionnaire for the second wave of the 2018 generation is in progress and will include additional questions about companies' satisfaction with digital platform.

The data were collected by post mail until 2019/2020 survey, and by internet and post mail since 2021. Due to sampling methods, INSEE releases results in percentages (rather than level) and for groups containing at least 20 companies in their sample.

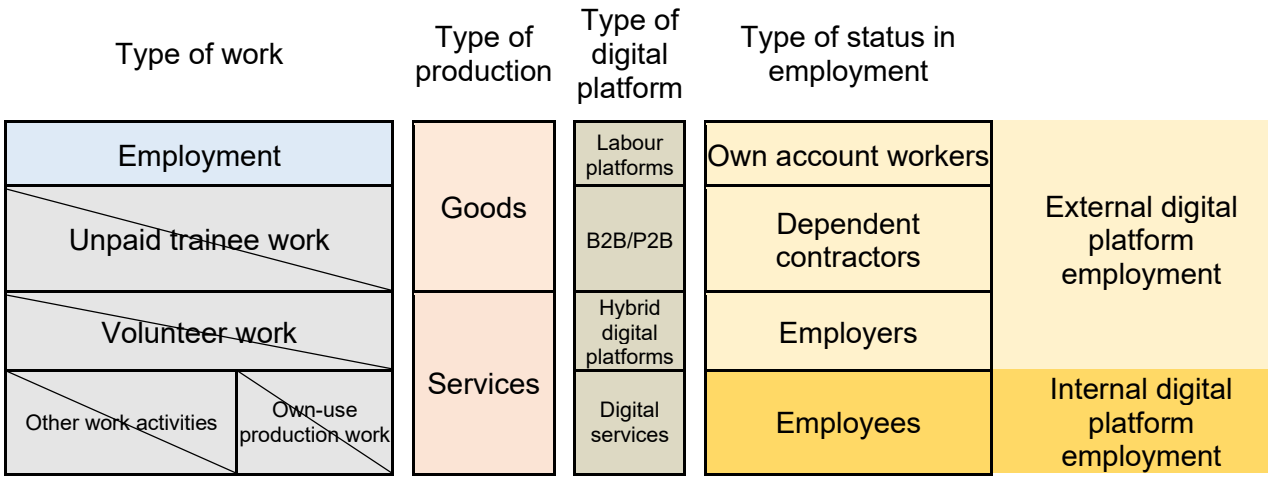
Implied operational definition

The SINE survey considers every type of digital platform used for contact with clients, either for selling goods or providing services, including accommodations rental, meal delivery, passengers transport. There were no explicit filters (e.g. YouTube, Instagram were not clearly excluded) but some examples of digital platforms were given in the questionnaire:

- passenger transport (ride-sharing);
- home delivery;
- home services dedicated to households;
- consultancy.

No explicit definition of DP was provided in the questionnaire. The main question on DP included is: "Do you work through one or several digital platforms to reach clients (e.g. passenger transport, home delivery, home services dedicated to households, consultancy)?".[14] The question was asked only to own-account workers (creators of an enterprise, either as a natural person or a legal entity). In most cases, the question concerns users of DP but creators of a digital platform themselves (digital platform being considered as an enterprise) are likely to be sampled in SINE (although probably very rarely).

Figure 5.10. Implied conceptual scope in INSEE study



Key results

Results are already available for two cohorts of firms, while those for a new cohort will be available in 2022. Considering companies created in 2018 and it their first year of activity:

- 16 % of the "auto entrepreneurs" work with DP (2 out of 3 among those in the transportation sector). For three-quarters of them, DP is the main source of turnover. In the transportation sector, two-thirds of the "auto entrepreneurs" work with DP; for 90% of them, the DP is the main source of turnover, while half of them created their business especially to work with DP.
- Among the other companies, 10 % work with DP. For half of them, the DP is the main source of turnover. In the transportation sector, 36 % of the new enterprises work with DP, and for 75 % of them the DP is the main source of turnover. A large share of companies in this sector is constituted with taxi companies or ride-sharing companies. Entrepreneurs working with DP are also overrepresented in the accommodation and food service activities (16 %).

DP remain important after the company creation: Among auto-entrepreneurs with companies created in 2014, SINE data show that, by 2019, five years after their set-up. 5 % of the auto-entrepreneurs still in activity use DP. Among them, 54 % use DP as their main source of turnover.[15,16]

Tax registers

Tax registers can be used as an information source on digital platforms either if a list of platform operating in the country is available (with the problem to identify cross-border platforms) or if the information about working for a platform (or being one, in case of a file of enterprises) is present in the tax register. The main limit of the tax register approach is that is very closely linked to the national legislation, and its feasibility depends on it. This, however, also causes severe harmonisation problems: even though the derived information can be very useful at national level, international comparisons are nearly impossible.

Tax register data on digital platforms is available in Belgium following enactment of a specific law in 2016, defining a specific tax regime for incomes of enterprises in the “sharing economy”. Statbel, the Belgian statistical office, uses information on the tax situation of individual workers in the sharing economy for producing experimental statistics on the number of platform workers and their earnings. While not all informal work arrangements are covered by these registers, which can led to an underestimation of the number of platform workers and on the total income generated by the platforms, the introduction of a

specific tax regime for these firms aimed to limit as far as possible the area of informal employment in DPE.

Belgium – Statbel

Original purpose

The Belgian Programme Law of 1 July 2016 introduced a specific tax regime for companies in the sharing economy. Platform companies are compelled by law to declare the income of its platform workers to the Belgian tax authority on an individual basis. The purpose of this tax regime was to provide fiscal advantages to platform work. By analogy with other administrative files, the new dataset containing the earnings of platform workers primarily serves an administrative/fiscal purpose. However, the Belgian statistics law provides the possibility for Statbel to receive and to use administrative data in order to compile anonymous statistics. For this purpose, a confidentiality contract was concluded between the Belgian tax authority and Statbel.

The Belgian tax register of the sharing economy includes the following five variables:

- the unique enterprise number of the platform company;
- the unique individual number of the platform worker;
- the income earned by the platform worker declared per platform company;
- the period during which platform work was performed (start and end date);
- the activity of the platform work.

Reference population

Between 2016 and 2020, the tax authority attached three conditions to the application of the favourable tax regime for sharing economy enterprises:

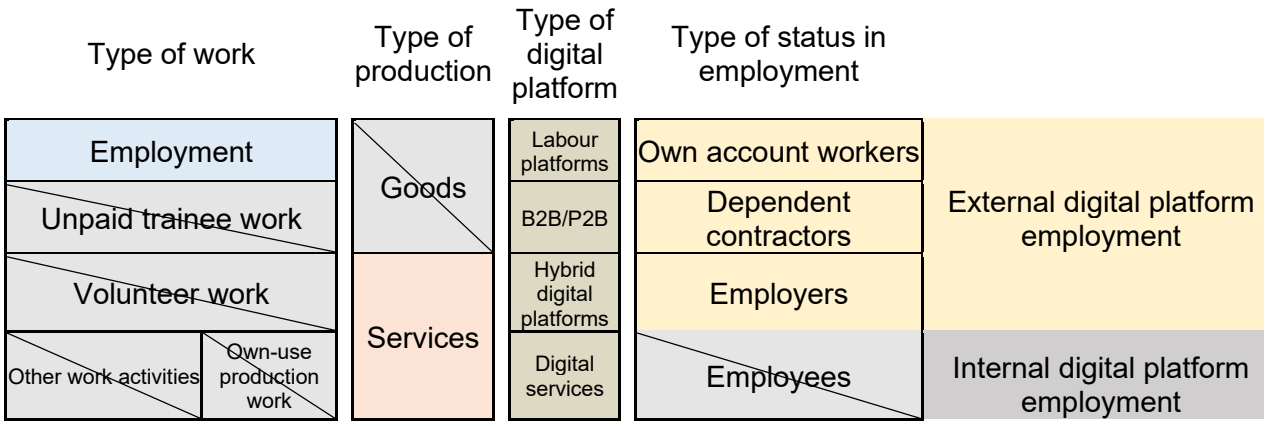
- the scheme was limited to services provided by a private individual to another private individual;
- the platform company had to have official recognition, granted by the Belgian tax authority;
- the favourable tax regime was only applicable if the gross income from platform work was below a predefined maximum amount. In 2020, this gross maximum amount equalled to EUR 6,340 on an annual basis.

In fiscal year 2019, 85 companies were granted recognition as platform companies. These 85 companies reported the income of 20 600 platform workers to the tax authority. From 2021 onwards, platform work is no longer limited to the recognised platform companies and the regulation regarding the maximum amount has also been dropped. All income from platform work must be reported to the tax authority via the same regulation, which should improve the completeness of the file.

Implied operational definition

The description of the reference population in the law lists the conditions that the tax authority attaches to the application of the favourable tax regime for platform work. First of all, the regulation only applies to services that a private individual provides to another private individual. The tax authority excludes the transaction of a good, including the rental of an accommodation, from its definition of platform work. However, there is an exception for transactions involves the provision of a service. The rental of an accommodation is for instance considered as platform work when cleaning of the room or a breakfast are provided.

Figure 5.11. Implied conceptual definition of Statbel study



The favourable tax regime is only applied if the gross income from platform work was below a predefined maximum amount. For 2020, this gross maximum amount was EUR 6 340 on an annual basis; when exceeding this amount, the tax authority considered the platform worker to be self-employed. Platform workers who earned more than the maximum amount were therefore not included in the tax register of the sharing economy, but in the regular tax register that collects professional income. The maximum amount also implied that platform work was always considered as an extra income and could not be the main activity.

Under the rules described above, platform work can be performed by both inactive persons (e.g. students or retired people) and employees or self-employed persons. An additional restriction applies for self-employed persons: the activity of platform work may not be their main activity; in other terms, a self-employed gardener may not perform platform work as a gardener but may provide another service within the sharing economy. Until 2020, the platform company had to have official recognition granted by the Belgian tax authority.

A new regulation applies since fiscal year 2021. Prior recognition as a platform company by the tax authority was abolished and the predefined maximum amount to earnings from DP no longer applies. All income from platform work has to be declared to the tax authority via the same regulation from 2021 onwards. The new regulation should improve the completeness of the specific register for platform workers.

Lessons learned

Statbel's experience with the use of tax registers in order to map out platform work is largely positive, thanks to the specific tax status of platform workers, which leads to a separate file dedicated to the sharing economy within the tax register. It is also important that the statistical institution has easy access to administrative data, which is facilitated in Belgium by the national statistical law. On the other hand, the use of administrative data also creates dependency and the data are not representative for the whole population. Main advantages and disadvantages that Statbel encounters when using the tax register include:

- **Among the advantages**:
    1. The specific tax regime for the sharing economy means that platform workers have their own file within the tax register. This allows platform workers to be easily identifiable while providing that Statbel an extensive and high-quality database. The tax register for the sharing economy contained individual data of 20 600 platform workers in 2019.
    2. The tax register contains both a unique enterprise number for the platform company and a unique individual number for the platform worker. Based on both

identifiers, Statbel can match the tax register to other databases, which offers multiple, relevant possibilities of analysis. For the platform company, couplings made with the statistical business register and VAT statistics (among others) provided information on economic activity (NACE nomenclature), size class, location and turnover. For platform workers, matching with other files within the tax register generated data on the status of the platform worker (employed, retired, student, etc.).

- **Among the disadvantages:**
  1. The tax authority determines the content of the register based on its tax needs. As a statistical institution, Statbel has therefore no say on aspects such as the available variables, concepts used, target population or timeliness. This creates a great dependency and may lead to Belgian definitions being different from international concepts.
  2. Not all platform companies applied for official recognition, so that platform workers of non-recognised companies were considered as self-employed for tax purposes. In addition, given the predefined maximum income amount, the activity of platform work was never considered as the main work. The tax register is therefore not exhaustive, as some platform workers do not meet the conditions set by the tax authority.
  3. Large platform companies often operate in Belgium from an office abroad. These companies are not included in Belgian statistics or databases, which means that the advantage of additional matchings with other databases is lost.

Ad-hoc surveys

An ad-hoc survey, specifically focused on DPE, can gather very good information on thee more qualitative aspects of the platform work, such as working condition and income. The reference population can be targeted to capture the DPE phenomenon, with the sample adequately representing this population or at least covering it in a well-controlled way, thereby allowing to investigate even small or very small aspects of the phenomenon. As an example, the sub-population of platform workers can be the reference population, setting to one the probability of interviewing the persons object of the analysis, but losing the connections with the entire population. Planning an ad-hoc survey requires good *a priori* information, for example a method to identify all platform workers to be included in the reference population. When this *a priori* is of poor quality, preventing the reference population to cover all interested persons, there will be high probability to have a biased, or at least self-selected sample. In the planning process of these ad-hoc surveys, both the choice of the reference population and of sampling framework are of paramount importance.

An ad-hoc survey requires a huge amount of preparation, after which it can provide information not available otherwise. The Joint Research Centre of the European Commission (JRC) runs an ad-hoc survey in the context of the COLLEEM research project on collaborative economy.

European Commission – Joint Research Centre

Original purpose

The scope of the COLLEEM survey is broad and includes the following objectives:

- Assess and quantify in an homogeneous way the prevalence of platform workers across selected EU countries and in Europe at large.

- Provide a classification of platform workers on the basis of the frequency and intensity of platform work, and its relevance for individuals' total income.
- Profile platform workers in terms of their socio-demographic characteristic (e.g. age, gender, education; household composition; migrant status).
- Identify the actual and perceived labour market status of platform workers (i.e. dependent employee or self-employed).
- Identify the type of tasks that are provided via platforms (i.e. online professional, online non-professional, on-location).
- Identify the motivations of workers for engaging in platform work.
- Assess the work and employment conditions of platform workers.

Reference population and sampling

The reference population of each country included in the COLLEEM survey are all internet users aged 16 to 74. COLLEEM is a self-administered online panel survey. The survey followed a quota-based 'non-probability sampling design'. Quotas of respondents were established to provide representative estimates by age groups (16 to 24, 25 to 54, and 55 to 74) and gender (male/ female). Targets of completed responses in each group were allocated proportionally to the size of each group in the total population of internet users aged 16-74 in each country.

COLLEEM used Eurostat's most recent data on population by age and sex from the 'European Labour Force Survey' (LFS) for calculating the population in each age-gender category in each country. These figures were then multiplied by the proportion of internet users in each respective age-gender category (obtained from the Eurostat's Community survey on ICT usage in households and by individuals) to compute the population of internet users by age-gender groups.

The first pilot (COLLEEM I) wave was completed in 2017 gathering 32 389 responses from 14 Member states. The COLLEEM II survey was conducted in 2018 gathering a total of 38 022 responses, from internet users aged between 16 and 74 years old, in 16 EU Member states (Germany, France, Italy, Spain, Finland, the Netherlands, Sweden, Hungary, Slovakia, Romania, Croatia, Lithuania, Ireland, the Czech Republic, Portugal and the United Kingdom). COLLEEM aimed to gather a minimum of 2 300 responses per country. Countries were selected based on the following characteristics:

- Internet availability, skills and use, clustered in 3 groups;
- GDP per capita, cut into 4 groups;
- Geography, classified into 'Nordic', 'Western Europe', 'Central and Eastern Europe' and 'Mediterranean'.

The survey was designed to capture the diversity of groups created by intersections of these three dimensions.

Other relevant survey features

The survey was administered using SurveyGizmo and disseminated to respondents of an online panel survey aggregator CINT (www.cint.com). A unique feature of the COLLEEM II survey is that it includes a longitudinal sub-sample, consisting of respondents who were interviewed in both 2017 and 2018, as CINT allows to reach the same individuals who have previously participated in a survey based on their unique identifiers. The longitudinal sub-sample consists of two parts: the first part is made up of re-invites, i.e. all people identified as platform workers in COLLEEM I and re-invited to take part in COLLEEM II; the second part consists of people (whether identified as platform workers or not) who were by chance selected again from the sampling frame to be part of the COLLEEM survey. Taken together, the longitudinal sub-samples

of COLLEEM II allow to analyse individual transitions in and out of platform work, as well as to check the robustness of the cross-sectional findings.

Implied operational definition

The broadest definition of platform workers used in the COLLEEM surveys refers to workers who have ever gained income from providing services via online platforms, where the platforms digitally match provider and client and ensure the payment, and where work is performed either online (location-independent) or on-location. Within this context, digital labour platforms are defined as digital networks that coordinate labour service transactions in an algorithmic way. It is also worth noting that the definition of platform work used in COLLEEM is restricted to labour services, thus excluding digital platform employment where the main purpose is selling goods, or to provide services such as renting out an apartment, where labour input is marginal. Definitions are identical in COLLEEM I and II.

In an effort to narrow the definition and to identify different categories of platform workers, COLLEEM II data divides platform workers into 'sporadic', 'marginal', 'secondary', and 'main' based on a combination of number of weekly working hours (less than 10, 10 to 19, more than 20) and contribution of the platform work to workers' total income (less than 25%, from 25 to 50%, over 50%) (see Table 5.3).

Table 5.3. Classification of platform workers based on income and hours worked

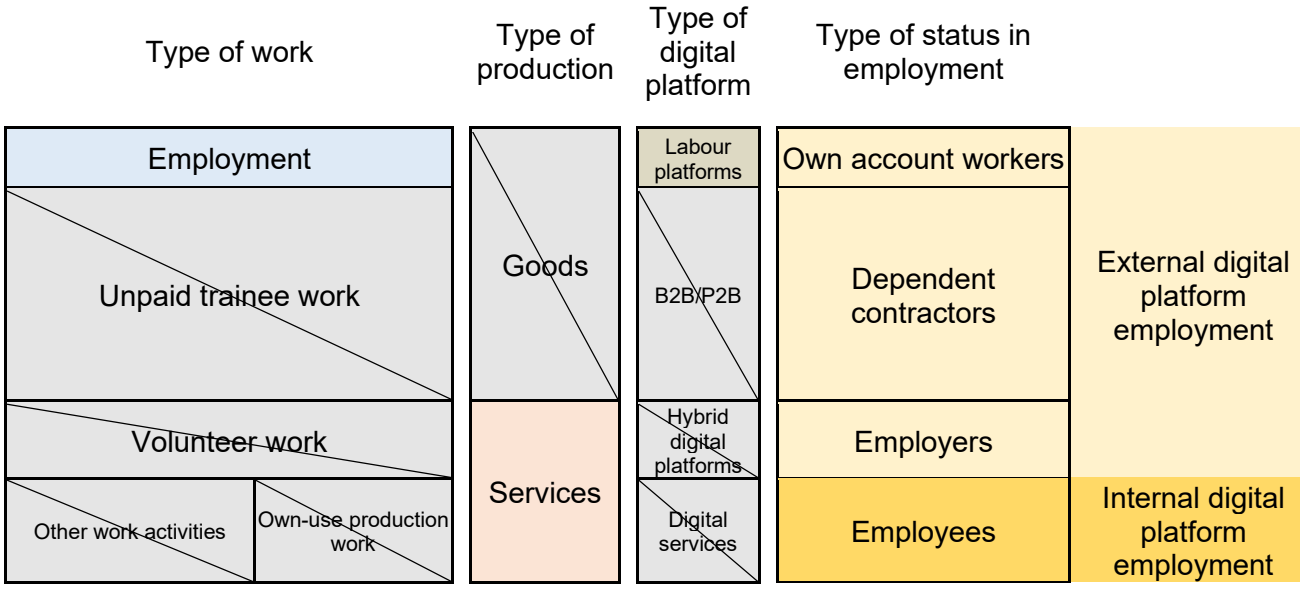
	Weekly working hours			
Share of total personal income	***Less than 10 hours***	***10 to 19 hours***	***20 hours or more***	***No answer***
Less than 25%	Marginal	Secondary	Secondary	Marginal
25% to 50%	Secondary	Secondary	Main	Secondary
50% or more	Secondary	Main	Main	Main
No answer	Marginal	Secondary	Main	Missing

Source: JRC, Digital labour platforms: The COLLEEM research project, https://joint-research-centre.ec.europa.eu/digital-labour-platforms-colleem-research-project_en.

Regarding the information on working tasks, COLLEEM elicits information on ten different types of tasks, combining locus of provision and skill level:

- online clerical and data-entry tasks (e.g. customer services, data entry, transcription, and similar);
- online professional services (e.g. accounting, legal, project management and similar);
- online creative and multimedia work (e.g. animation, graphic design, photo editing and similar);
- online sales and marketing support work (e.g. lead generation, posting ads, social media management, search engine optimisation and similar);
- online software development and technology work (e.g. data science, game development, mobile development and similar);
- online writing and translation work (e.g. article writing, copywriting, proofreading, translation and similar);
- online micro-tasks (e.g. object classification, tagging, content review, website feedback and similar);
- interactive services (e.g. language teaching, interactive online lessons, interactive consultations and similar);
- transportation and delivery services (e.g., driving, food delivery, moving services and similar);
- on-location services (e.g. housekeeping, beauty services, on-location photography services and similar).

Figure 5.12. Implied conceptual definition of the JRC study



Key results

The COLLEEM survey was a pioneering attempt to measure in a homogeneous manner the prevalence of platform work across European countries. The survey has provided insights on the socio-demographic profile of platform workers, their motivations to enter into this type of activity, their actual and perceived professional status and their working conditions. Key results from COLLEEM were presented in Chapter 2.

Lessons learned

The experience of COLLEEM can provide useful insights for designing ad-hoc surveys on platform work in the future, always keeping in mind the limitation and potential source of bias of using online surveys for measuring platform work. In particular:

- **Gathering information on the frequency, hours and income generated through platform work is crucial to gain a more precise and policy-relevant measure of the phenomenon**. As shown in COLLEEM II, it is important to classify platform workers on the basis of the frequency and intensity of platform work, and its relevance for individuals' total income. Disentangling different types of platform workers according to these criteria allows to assess the share of workers who provide labour services through platforms as their main job (or at least frequently), their socio-demographic profile and perceived employment status – all aspects which may differ significantly from those of "sporadic" platform workers. This is particularly relevant for informing labour market policies aimed at regulating platform work.
- **Gathering information on the specific tasks carried out can provide insights on working conditions and on how platforms affect the nature of work**. COLLEEM II survey asks to frequent (at least monthly) platform workers on which specific task they spent most of their working time, how long it usually took to complete such a task, how much they earn, and which platform they used to carry out the task the are referring to. At the aggregate level, collecting this type of information provides useful insights on the bundling and distribution of work tasks. Moreover, as more than 69% of platform workers report being paid on the basis of the performed task, collecting information at the task-level allows to directly link information on income with data on worked hours,

working conditions, and the main used platforms. This is useful since platform workers often carry out different tasks through various platforms.

- **There are ways to address issues of representativeness and measurement error that are typical of online surveys**. Self-administered online survey using non-probabilistic samples are useful in exploratory research aiming at identifying whether a specific and relatively rare characteristic – such as being a platform worker – exists in a population. However, whilst suited for the general aims of the COLLEEM, these types of surveys are affected by a number of possible errors, such as biased sample and reference population, unreliable responses, no knowledge of who is actually answering and under what conditions. In order to mitigate some of these issues, COLLEEM used a number of techniques to guide respondents throughout the questionnaire, including:
  - Usage of previous responses to clarify reference points in the following questions;
  - Extensive use of instructional texts;
  - Introducing a number of tests for suspicious answers, dropping from the final sample respondents who failed more than three tests.
- **Finally, experience with COLLEM has shown that the key screener question, aimed at ascertaining whether respondents provide services via digital labour platforms, inevitably implies formulating complex and lengthy questions** which are difficult to comprehend properly and are potent sources of respondent fatigue.
- **Self-administered online panel surveys may not be representative of the situation of disadvantaged groups.** The fact that respondents are contacted and the information is collected entirely online, make it likely that some of the most disadvantaged forms of platform work (such as delivery or other low-skilled in-person services) are underrepresented in the survey. These more disadvantaged forms of platform work are often taken up by groups of the population that find it difficult to participate in the regular labour market (such as migrants). This implies that results on the overall working condition of platform workers may be biased, reflecting more the (better) conditions of online professional types of platform work than those of on-location personal services such as delivery or transport.
- **Conducting a pilot survey can prove useful to improve the representativeness of the actual survey**. The COLLEEM pilot survey showed that reaching certain types of internet users, notably those with lower-than-average frequency of internet use and younger users with low formal education, can be very difficult. As a result, these groups remained rather underrepresented in the survey, requiring the use of larger sample weights and a loss of precision of the estimates. Therefore, in order to improve representativeness, and before making any weighting adjustments, COLEEM II focused on the panels which produced more representative responses than others in the first COLLEEM wave, targeting these priority panels during the fielding.

In light of the limitations of online panel surveys, and in a view to complementing existing evidence from COLLEEM I and II waves, the JRC is implementing a third wave of COLLEEM. This third wave will include the same questions for platform workers as COLLEEM I and II, but collected in the context of a face-to-face interview and with the respondents being randomly drawn from the population, using area sampling. Although only two countries will be covered (Spain and Germany), the sample will be considerably larger (between 3 000 and 4 000 cases per country) and of much better quality. This will provide information to assess the possible biases of the online panel approach used in previous COLLEEM waves, on top of providing the usual information. The third wave of COLLEEM will introduce a broader concept of platform work, understood as the use of digital networks for the coordination of work processes in all kinds of organisations and economic activities, and the related concept of algorithmic management. In other words, the third wave of the COLLEEM survey aims to broaden the concept of platform work, collecting information on the use of platform-like digital tools for the coordination of work processes in all sectors of economic

activity (not only in digital labour platforms as done in COLLEEM I and II). The survey will also aim to gather information on how platform-type tools for coordinating work processes are impacting on work organisation, job quality and industrial relations.

Commercial data, smart data or other data from private sources

European Commission – Eurofound

The rise of Web 2.0 technologies has facilitated the collection of data from internet users as a valuable source of information that can complement traditional sources such as surveys, expert opinions or data from stakeholders. The appeal of crowdsourced data stems from the lower costs of data collection and the potential for reaching a large number of respondents who would otherwise be inaccessible. However, these advantages need to be weighed against drawbacks around data quality, representativeness and consistency.

Crowdsourcing data are gathered by a public or private entity based on an explicit request for individual level users. Participation in data gathering exercises can be either voluntary or incentivised though a monetary or non-monetary incentive such as wage information of an employee relative to employees working in the same occupation, sector or jurisdiction. While active crowdsourcing implies a direct data request from platform users, the collection of user-generated content (UGC) is based on big data or web-scrapping and web-crawling tools to gather, sort and classify content. The latter approach was employed by (Kässi and Lehdonvirta, 2018[3]) who used big data to develop the Online Labour Index (OLI), an indicator of the size of the online platform economy. OLI uses the number of unique visitors and vacancies on a platform to measure change in the online labour market. A limitation of this approach is that OLI does not record the actual labour performed on platforms or information on working conditions but only the demand for labour. Another limitation of this approach is that the sample is limited to English language platforms.

Social media can also be used to reach smaller and geographically scattered cohorts of platform workers. Provided that stratification techniques are used to reduce bias, social media websites such as Facebook can be used to target platform workers and gather information though simple and short surveys. Facebook allows gathering geolocation data and behaviours specification – keywords such as expats, platform, rider - which allow for the survey to be targeted to relevant groups. Although appealing for its simplicity, this approach has several shortcomings stemming from the inherently biased sample of Facebook users.

The changing regulatory landscape around the platform economy can also facilitate data gathering exercises. In countries such as Belgium, Denmark, France or Estonia changes in the tax systems have introduced reporting systems that allow obtaining income data from platforms. While the data gathered through these sources can complement traditional surveys, their quality depends on the co-operation of platform companies as well as specific rules around income thresholds and reporting requirements (Eurofound, 2021[4]). For example, the Estonian system which is operational since 2017 operates on a voluntary basis and is used mainly by ride-sharing and rental platforms. While promising, current attempts to use big data to gather information about the scale of the platform economy are useful only in conjunction with traditional statistics.

Measurement recommendations

The overview of statistical experiences presented above provides an overall picture of the situation: the variety of sources and approaches shows that there is not a single answer to the problem of measuring digital platform employment. Integration of information from different sources seems to be the optimal choice. The complexity of the measurement derives from the particularity of the DPE market: this is often

a three agents market, with a provider (the worker), a client (that can be an enterprise or a household/individual) and an intermediary (the platform, which typically is an enterprise). This makes the diversity of sources an asset for statistical activities in this field.

While lessons learned, for each source, were already suggested by the TEG contributors in the specific sections above, some important general recommendations are provided below.

The labour force survey may be the most relevant source of information for the analysis, and for designing policy, of the labour market. It may evolve to be the best suited to provide quantitative information on the supply side of the labour market, i.e. from the workers' perspective, and, having usually a high frequency, can promptly catch new dynamics on the market. It provides benchmarks for all other sources. Its main drawback is that it is not best suited in providing information about small or very small phenomena, like the DPE still is. Another problem of the LFS is the information on earnings, which is not always present or reliable.

The statistical experiences based on LFS described above highlight a range of differences in terms of whether questions on DPE are asked to all respondents or to subset thereof (e.g. those classified as "employed", or own account workers), whether they include or exclude activities related to renting out capital goods (where labour services only have an auxiliary function); whether different typologies of digital platform employment should be distinguished; what reference period should be considered in order to classify workers as performing a digital platform activity (e.g. previous week or previous year); whether digital platforms should be limited to those that, in addition to matching workers and clients, also manage the payment between the two; whether specific digital platforms should be mentioned to guide respondents; and more. While no single answer to all these questions exists, and the best approach will partly depend on the number of questions that could be asked (i.e. few, in the case of questions included in the general questionnaire of LFS; potentially more, in the case of ad-hoc or recurrent LFS modules), a number of general recommendations can be provided at this stage:

- The LFS should be the tool of choice when it comes to attempting to measure the number of people involved in digital platform employment.
- People's activities taking the form of an "employment relation" mediated by digital platforms should be clearly distinguished from activities referring to a broader notion of "work" and from those involving the rental of capital goods owned by survey respondents. While some NSOs may narrow their questions to DPE, those opting for a broader remit should do so in ways that allow to clearly distinguishing between the various activities.
- While some NSOs may use a longer reference period to assess workers engagement with digital platforms, LFS questionnaire should always include questions about employment in the survey reference week, so as to allow measuring the incidence of DPE among all employed people.
- In addition to basic breakdowns of DPE by demographic and other characteristics included in LFS, LFS should ask respondents on the "regular" or "occasional" nature of their DPE relation, based on either the number of hours worked or the earnings gained.
- Digital platforms should meet the twin criteria of both intermediating between clients and service providers, and playing a role in managing the payment for the services provided. NSOs relying on broader definitions, should implement them is ways that allow narrowing the focus on the above definition.
- Naming of specific digital platforms should be avoided when first asking questions on DPE, but could be used in follow-up questions.

The Information and Communication Technologies (ICT) Use survey on households and individuals is a natural source for information on DPE, and can offer information on the supply side and on the demand from private individual side. A section of the questionnaire, focusing explicitly on the DPE is necessary, since not all currently in use survey are studied with this purpose and confusion can arise by the fact that

both, providers and clients 'use' the ICT tools and *ad-hoc* questions should be studied to distinguish them. It can provide precious information on particular aspect such as time spent on work and needed skills.

Business surveys typically is the instrument for collecting data around the digital economy as outlined in chapter 2, however it can provide information on both, demand (those not covered by the ICT survey: the business demand) and supply side of the labour market, with insight on the individual income, which is a valuable complement to the LFS data. They may cover the platform themselves or the enterprises playing the role of clients in the market. In the first case, it will be difficult to reach all the platform operating on a country, especially for platforms based abroad, in the second case it is impossible to cover non-business clients. Particular important is to state the reference population of the survey, which may not always cover the entire enterprises population. To the extent possible, business surveys:

- Should cover the universe of business units operating in a country, focusing on business' demands for services provided by digital platforms.
- Rely on a definition of digital platform that is closely aligned to that used by LFS, i.e. platforms that both mediate between clients and providers, *and* that intermediate the payment for the labour services provided.
- Provide information on the quantitative importance of digital platforms for their turnover, as well as questions on their satisfaction with that relation.
- Include common breakdowns of businesses (e.g. by size of their payroll, industry, annual turnover, ownership type) allowing to compare businesses' reliance on digital platforms across different parts of the business community.

Tax registers, or in general other administrative registers, can provide information from both the platforms (when it is possible to identify them as tax payers) and from the workers (when it is possible to identify them as DPE workers). Information on income is the main item that is best covered by this source. However, coverage of tax registers will be limited to formal enterprises and workers, which is an important limit in some countries. Moreover, when low paid workers are exempted from tax declaration and/or payment, they are also excluded from the reference population.[17] More generally, the reference population of tax registers and other administrative data will be affected by national legislation that usually has not statistical purpose, limiting the representativeness of the source and the cross-national comparability based on them of measures.

When the required information focuses on particular qualitative features of the work, such as working condition or working satisfaction, an ad-hoc survey is the best choice. They can be specifically designed to focus on small or very small phenomena, ensuring a representative sample. While they require a big planning effort and dedicated resources, they provide information that is not feasible to collect with other sources, information which is often necessary to calibrate labour market policies focusing on relevant but small (or not yet big) phenomena.

Ad-hoc surveys such as COLLEEM have the advantage of typically covering a broad range of countries, hence providing comparable evidence on different aspects of DPE. Consideration should be given to including a small set of comparable questions in other non-official surveys on working conditions (e.g. EWCS, ISSP, etc.), while aligning concepts and definitions to those used in LFS.

Big data-based sources are in an early phase of investigation. They are promising but it is clear that they can just complement the other sources: by their nature it is difficult to plan their information coverage, this is more an output of the study than an input since the information extraction and its own definition proceed in parallel. Moreover, private ownership of the data makes them expensive and unreliable its use for official statistics. Also, continuity in time of the availability of this kind of data cannot be ensured. This makes this source more feasible, at the moment, for one-shot investigation on one particular aspect of digital platform employment, always in conjunction of traditional sources. Regular production of labour market indicators of DPE from big data sources does not seem a realistic option at present.

Whatever the data source, it is important to document the number of jobs exercised by digital platform employees and/or the frequency of DPE activities over the LFS reference period and over longer reference periods.

A further reflection should cover the role of well-designed policies for providing high-quality statistical information. It is clear, for example, that tax legislation providing special regimes to DPE incomes helps in identifying the reference population and, more generally the boundaries of the phenomenon. Moreover, some countries have introduced obligations for big data producers or for labour digital platforms to provide their data to statistical authorities, and this is a real boost for high-quality data production. This is an important area for future development.

Conversely, measures of digital platform employment should be independent of legislative changes that classify digital platform workers. Failing to ensure the independence between legislation and statistics would impact on both cross-sectional and time series estimates of DPE.

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Notes

[1] Note that names are used if the question is asked about people in the household other than the respondent (The CPS accepts proxy responses). If respondents answer “yes” to the in-person question (Q1) or online question (Q2), they are asked the follow-up “which job” question (Q1a or Q2a). The question wording and response option for "second job" only appears for people who were previously identified in the survey as having more than one job. For people with only one job, the question read "Was that for your job or additional work for pay?" People with only one job are asked whether the in-person platform work was for their job or additional work for pay.

[2] For more information about the development of the questions, evaluation of the data, and recoding of answers, please refer to *Electronically mediated work: new questions in the Contingent Worker Supplement* . (https://www.bls.gov/opub/mlr/2018/article/electronically-mediated-work-new-questions-in-the-contingent-worker-supplement.htm#_edn12).

[3] MMV 2017: The Sampling Frame of Dwellings (MMV, Spanish Acronym) is based on the results of the abbreviated Population and Housing Census of 2017 and the lists of dwellings associated with the 2016 Pre-Census. The MMV 2017 has been regularly updated during intercensal periods, using administrative records and, when necessary, an enumeration of prioritized geographic units.

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[5] The main activity is the activity in which the person worked the most hours in the reference week, regardless of whether the person engaged in another activity of shorter duration for which the person will be paid more.

[6] CAPI: computer-assisted personal interview.

[7] Only those applications and platforms that appear in the dictionary are searched for in the description because they are the most likely to appear. However, other applications and platforms may be included in the dictionary as they enter the Chilean labour market.

[8] For official estimates, INE uses the Standard for Assessing the Quality of Estimates in Household Surveys to determine the reliability of an estimate.

[9] Own account workers are persons who operate their own business without hiring any paid employees.

[10] As adopted in the 19th International Conference of Labour Statisticians, Resolution concerning statistics of work, employment and labour underutilisation.

[11] The ICT can also be designed to collect information from the enterprises side (ICT survey in business) but here the focus is on the households and individual survey.

[12] 2018 questionnaire; 2020 questionnaire.

[13] "Auto-entrepreneurs" (or “self-entrepreneur” in English, are self-employed entrepreneurs with a specific status including simplified formalities) were also asked whether working through DP was one of their main reasons to choose the "auto-entrepreneur" scheme. The same question was also asked in 2019 to auto-entrepreneurs who started their business in 2014, i.e. five years after creation. The question was not asked to other types of entrepreneurs.

[14] “*Travaillez-vous par l’intermédiaire d’une ou plusieurs plateformes numériques de mise en relation (exemple: VTC, livraison à domicile, services à la personne, services ou conseil aux entreprises*) ».

[15] Data from the 2022 survey (expected by early 2023), and referring to companies created in 2018 and observed three years after creation, will also cover: i) The year when the entrepreneur started working with DP; ii) its satisfaction level in terms of the turnover made by working with DP, the legal agreement between the entrepreneur and the DP, the access to the market through DP, and the degree of freedom in the organization and in work (hours, subordination, etc.) provided by DP.

[16] In the 2022 survey, INSEE will add some questions on the digital platform module, asking new business owners whether they use a DP to get a better visibility, to benefit from a turnkey application, to expand their activity, the difficulty to access the market without DP. These items will be tested in February 2022 on a sample of new enterprises, with the possibility for the respondent to mention other reasons of using DP.

[17] As an alternative or complement to the use of tax registers as a source of information on the income of digital platform workers, consideration should be given to including specific questions in official household income surveys.

Handbook on Measuring Digital Platform Employment and Work

National Statistical Offices face a growing policy demand for better statistics on digital platform employment and work. New statistical definitions are needed to avoid undercounting the number of people involved in these jobs. In addition, new sources of data, including non-official ones, may be needed to meet the statistical challenges of measuring digital platform employment and work. The OECD, the International Labour Organisation and the European Commission have joined forces to produce this *Handbook on Measuring Digital Platform Employment and Work*, which assesses measurement options and provides first recommendations on these issues. The Handbook first proposes a general definition of digital platform work and a conceptual framework that helps identify the key features of digital platform employment and work, which statisticians should bear in mind when designing their research objectives and operational protocol. The Handbook then reviews the main statistical vehicles used for measuring digital platform employment, and discusses previous statistical initiatives by National Statistical Offices through the lens of its conceptual framework.

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