



▶ Technical Note 3

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▶ International experiences and standards in monitoring the employment and social security coverage of workers in the platform economy: lessons for a survey in China

Key Points

Evidence-based policymaking in response to new forms of employment is currently hampered by the lack of consistent and robust statistics on the number, characteristics, and conditions of workers in digital platform employment. This technical note presents the strengths and weaknesses of national strategies in the European Union aimed at monitoring the employment and social security situation of workers in platform economies and documents ongoing international efforts to harmonize the different approaches. Finally, it compares the methodology used by the Chinese Academy of Labour and Social Security to survey workers in platform employment in China and concludes by acknowledging its sound contribution for a national monitoring framework on the employment and social security in China.

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List of abbreviations

AMT	Amazon Mechanical Turk
BLS	Bureau of Labour Statistics (United States)
DPE	Digital Platform Employment
ICLS	International Conference of Labour Statisticians
ICT	Information and Communication Technologies
ILO	International Labour Organization
IMF	International Monetary Fund
LFS	Labour Force Survey
OECD	Organization for Economic Co-Operation and Development
OLI	Online Labour Index

Introduction

Evidence-based policymaking in response to new forms of employment is currently hampered by the lack of consistent, robust and comparable statistics on the number, socio-economic characteristics, and conditions of work, notably in the case of digital platform workers. For instance, in 2016 and 2017, the Organization for Economic Cooperation and Development (OECD) and the International Monetary Fund (IMF) surveyed 40 countries on their practices regarding measuring the digital economy and found that most countries show slow progress in or give little priority to this area in national statistics (IMF 2018).

This statistical review is part of the research project *“Assessing China’s social security coverage of workers in non-standard forms of employment, with a focus on platform workers, migrants and women and measures to close gaps and improve portability of social security benefits”*, commissioned by the International Labour Office (ILO) and the Ministry of Human Resources and Social Security (MOHRSS) of the Government of China with financial support from the European Union (EU). The project conducted field interviews with local government officials in charge of social security, in the Provinces of Zhejiang, Sichuan and Guangdong, in China from September to November 2020. During those meetings, it was noted that there was a lack of administrative data and comparable survey data on employment and social security coverage of workers in non-standard forms of employment (NSFE) and in the platform economy to assist decision making.

The purpose of this technical note is to provide MOHRSS and its government officials at provincial level in China with recommendations for a common monitoring framework on the employment and social security situation of workers in NSFE and workers in digital platform employment (DPE) to assist policy making. For the ILO¹, NSFE is an umbrella term for different employment arrangements that deviate from standard employment. They include temporary employment; part-time and on-call work, temporary agency work and other multiparty employment relationships, as well as disguised employment and dependent self-employment. Non-standard employment features prominently on digital labour platforms. Work in digital platforms involves work mediated through online web-based platforms and location-based platforms. Therefore workers in platform employment are individuals who use an app or a website to match themselves with customers, in order to provide a service in return for money. They offer a diverse range of services including transport, coding and writing product descriptions (See glossary in Annex I).

The first section of this note considers the importance that monitoring frameworks play in the implementation of international labour standards (ILS) and their focus on monitoring the employment and social security situation of all workers regardless of their employment status. It illustrates the approach taken at European Union level in that regard. The second and main part of the paper provides a short review of the strengths and weaknesses of different methodological approaches used to collect data and produce statistics on the number, socio-economic characteristics and quality of social security coverage of workers in NSFE and in DPE. It discusses trade-offs and good practices in their designs and recommends the use of a combination of methods for national monitoring frameworks. The last two sections discuss the application of these lessons to the development of a targeted survey to be implemented in China and makes recommendations for a monitoring framework to assess the employment and social security of workers in NSFE and in DPE in China.

¹ <https://www.ilo.org/global/topics/non-standard-employment/lang--en/index.htm>

Why monitor the employment and social security of digital platform workers?

Social security monitoring and evaluation frameworks guide decision makers in the implementation of social security policies and strategies. They articulate institutional arrangements and data sources to provide information and track progress in strategy implementation. International social security standards indicate that monitoring is critical for the progressive realisation of social security rights. According to the United Nations Committee of Economic and Social Rights, States have the responsibility to monitor progress towards the realization of the right to social security, and they should proceed by identifying the factors and difficulties affecting implementation of their obligations (CESCR General Comment 19, Art. 39)². The ILO Social Protection Floors Recommendation, 2012 (No. 202)³ encourages countries to monitor progress in achieving objectives of national social security extension strategies through appropriate nationally defined mechanisms. To that end they need to regularly collect, compile, analyse and publish an appropriate range of social security data, statistics and indicators, disaggregated, in particular, by gender (paras. 3, 19, 21) (ILO 2017, ILO 2019).

Work in NSFE and in particular DPE is growing rapidly. The pace of growth increased during COVID-19 pandemic⁴. The evidence so far is that vulnerable workers are bearing the brunt of the crisis, particularly those who are self-employed and in DPE (ILO 2020 and OECD 2020)⁵. Many countries have progressively extended access to social protection to previously uncovered groups over the past decade and accelerated extension of schemes to uncovered groups during the COVID-19 crisis⁶ with mixed results. The identification of workers in NSFE notably in DPE is more difficult than other workers due to their jobs being more activity and task oriented, their shorter job duration and high job rotation. These features render work in NSFE and DPE in particular, of a “hidden” nature; as such the demographic, socio-economic and labour market characteristics of such workers fail to be adequately captured by traditional statistical instruments. The ILO 2020 General Survey “Promoting Employment and Decent Work in a Changing Landscape” indicated that: “The lack of clarity and concealment of employment relationships have an impact on the quality and quantity of work, the taxes collected and social security systems, as well as on economic and social policies as a whole”.

ILO and EU policies emphasize the need to provide all workers with effective and adequate social security coverage regardless of their work status. For example, the ILO Social Protection Floors Recommendation, 2012 (No. 202) emphasizes in its Art. 6 that members should provide basic social security guarantees to at least all residents and children, as defined in national laws and regulations. In Art. 15 it says that social security extension strategies should apply to persons both in the formal and informal economy. Likewise, the EU Council Recommendation of 8 November 2019 on access to social protection for workers and the self-employed⁷ (2019/C 387/01) puts emphasis on ensuring effective coverage for “all workers, regardless of the type of employment relationship, and for the self-employed” (EU 2019, Art. 9). However, ILO and EU recognize that social security systems were primarily developed for workers in ‘standard

² <https://socialprotection-humanrights.org/wp-content/uploads/2015/06/CESCR-General-Comment-19.pdf>

³ provides guidance to member countries to implement social protection floors within strategies for the extension of social security that progressively ensure higher levels of social security to as many people as possible.

⁴ <http://www.oecd.org/coronavirus/policy-responses/what-have-platforms-done-to-protect-workers-during-the-coronavirus-covid-19-crisis-9d1c7aa2/#section-d1e187>

⁵ Ibidem.

⁶ Ibidem.

⁷ There are several definitions of the term “workers” depending on national laws and regulations. The ILO includes “self-employed workers” in the definition of workers. The EU Recommendation tends to classify the two categories as distinct: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019H1115%2801%29>

employment relations', implying a long-term, full-time work relationship, which may leave other groups less covered. They therefore agree that policy measures to cover workers in NSFE and DPE by national social security systems may require adaptations to existing regulations or administrative processes⁸ (EU 2019 and ILO 2020).

Monitoring the employment and social security of workers in NSFE is thus essential to measure the effectiveness and efficiency of existing policy instruments and continuously seek ways to refine policy design and implementation (Behrendt, Anh Nguyen and Rani 2019, ILO 2020, ILO and OECD 2020). The third part of ILO Employment Relationship Recommendation, No. 198 focuses on the establishment of a mechanism to monitor developments in the labour market. It advises that national policies should include an appropriate institutional framework, or make use of an existing one, to monitor and review developments in the labour market and in the organization of work, and to formulate advice on the adoption and implementation of measures concerning the employment relationship (Paragraph 19). For example, in Denmark – the Government, the social partners and representatives of youth have established the Disruption Council to examine more flexible ways of working, and to review social security benefits for self-employed and temporary workers (ILO 2020:145).



Source: 123RF.com

The sharing economy is expected to grow 10-15 percent in China in 2021. The number of service providers and employees in the platform economy were 84 million and 6.31 million respectively. Live broadcast e-commerce, training/education and medical online services were the sectors that grew the most during the pandemic.

Sources: China Sharing Economy Development Report, 2021

Monitoring the demographic and employment characteristics of platform workers has several benefits. It helps grasp the heterogeneity of populations engaged in this form of labour. It also allows policy makers to anticipate the need for adapting social security policy design and implementation by capturing qualitative and quantitative changes in work patterns.

Monitoring allows to respond to questions such as whether workers in DPE are becoming younger, older, mostly women or men? Do they have children? Are they more or less educated? The Collaborative Economy and Employment (COLLEEM) survey, which was implemented in the European Union (2017 and 2018) had a longitudinal component. It showed that the proportion of younger women platform workers is rising year on year.

Longitudinal surveys such as COLLEEM also help understand if the growing number of platform workers include always the same individuals or if instead, DPE constitutes a stepping stone to other forms of employment. DPE also encompass a wide range of income levels. It is important to assess how many workers are poor or are at risk of poverty in absolute and relative ways by engaging in such activities or on the contrary, to see that perhaps DPE provides important supplementary income to the households.

⁸ <https://www.social-protection.org/gimi/Emodule.action?id=61>

For social security policy it is also important to understand the distribution of specific risks. What are the main risks and priority needs faced by DPE? They prompt more questions for further research: are these risks changing with shifts in demographics or more stressful working conditions, for example? We need also to be able to correlate the incidence of any specific risks faced by platform workers, to participation in social security. We can then understand the impact of the absence or participation in social security in workers' incomes, by type of risk and gender, for example.

Thus, national social security strategies and plans require robust and timely data. Likewise, the capacity of the international community to track progress on social protection at the global level hinges on the capacity of national statistical systems to provide such data. Sustainable Development Goal (SDG) 1.3 is to "Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable". This SDG Goal is under ILO custodianship and is measured by indicator 1.3.1 "Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable". Another important goal is SDG 3 that aims to "Ensure healthy lives and promote well-being for all at all ages". Its target 3.8⁹ is: "Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all". National authorities informing the UN about progress on these indicators need a robust and detailed monitoring system.¹⁰

The European Union monitoring framework on social protection for all workers and the self-employed is an example of a cross country monitoring initiative. The European Council adopted the Council Recommendation on Access to social protection (2019)¹¹ in which European member states are recommended to ensure that all workers and the self-employed can adhere to social protection schemes (closing formal coverage gaps), build-up and take-up entitlements, which can be preserved, accumulated or transferred across schemes (improving effective coverage), receive sufficient and timely benefits, contribute in a proportionate manner (adequacy) and are informed about their rights and obligations (transparency). The Indicators' Sub-Group (ISG) of the European Social Protection Committee piloted in 2020, the 0 version of the monitoring framework¹² that will track progress towards the attainment of those goals. An improved Labour Force Survey in 2021, will allow capturing a greater diversity of statuses, and measuring the prevalence of categories such as casual work or dependent self-employed, while ongoing efforts are taking place to better understand platform work.

The Social Protection Committee of the European Union has developed a monitoring tool which identifies annual key social trends to watch in the EU. It includes the dashboard of indicators. The list of indicators is available at:

<https://ec.europa.eu/eurostat/web/employment-and-social-inclusion-indicators/social-protection-and-inclusion/sppm>

The rationale for selection of those indicators and their relation with Sustainable Development Indicators is available at:

<https://op.europa.eu/en/publication-detail/-/publication/7cc15f72-ec38-11e6-ad7c-01aa75ed71a1>

⁹ <https://unstats.un.org/sdgs/metadata/?Text=&Goal=3&Target=3.8>

¹⁰ https://www.ilo.org/global/topics/dw4sd/themes/sp-floor/WCMS_560732/lang--en/index.htm

¹¹ <https://ec.europa.eu/social/main.jsp?langId=en&catId=89&newsId=9478&furtherNews=yes>

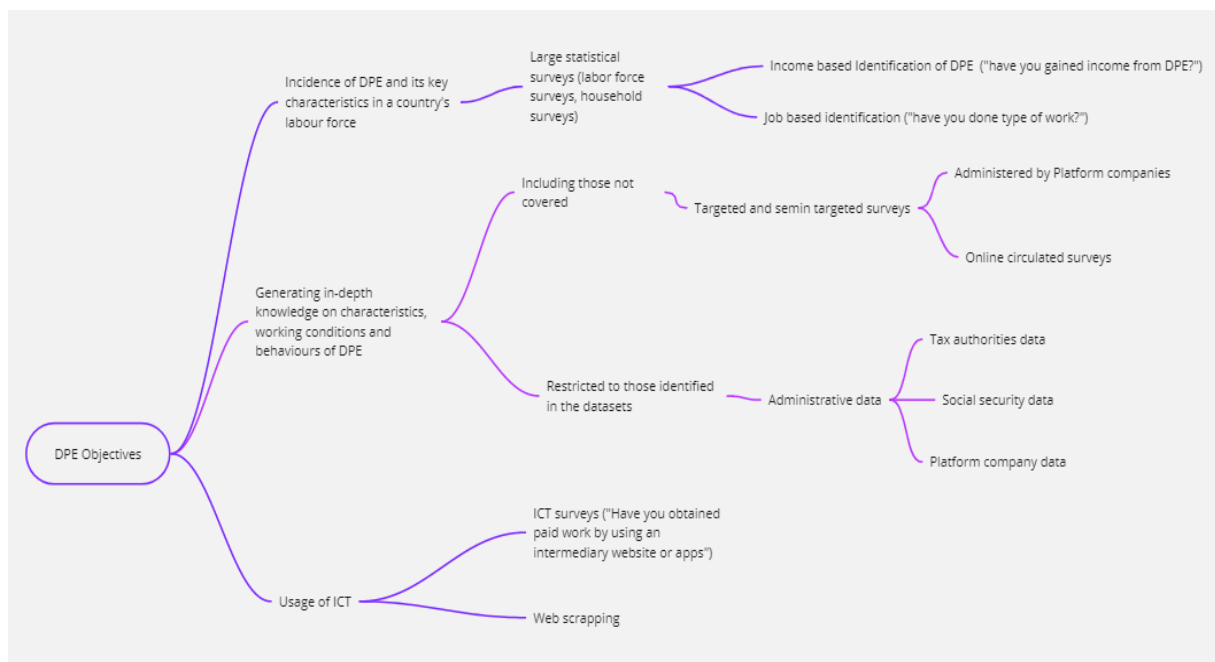
¹² <https://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=8363&furtherPubs=yes>

Approaches to collect data on digital platform employment

Statistical offices and researchers have resorted to different approaches to collect data on NSFE and DPE. Information has been gathered from:

- Representative surveys of a population, within which platform employees can be identified (using a combination of forms of identification of DPE),
- Targeted and semi-targeted surveys delivered online, potentially through the digital platforms themselves,
- Administrative data collected by governments or platforms,
- Alternative data sources such ICT surveys and web scraping (web harvesting or web data extraction).

Figure 1: Approaches to data collection on work in NSFE and DPE



Source: Authors

The appropriate choice depends on the research objective, resources, and trade-offs that researchers face.

For instance, traditional survey approaches are useful for measuring the share of digital workers in the labour force, their structures of income, and providing comparable statistics across different countries. As such, an adapted LFS statistics to measure NSFE and DPE would allow to respond to international labour standards' focus on surveying and comparing the employment and social security of all workers regardless of their employment status. Nationally representative surveys including questions or specific modules related to work in NSFE and DPE, also provide a way to monitor cost-effectively, several times a year, the employment of social security trends of all workers inclusive of NSFE and DPE.

However, since these surveys do not specifically focus on work in NSFE and DPE, they might come with the disadvantages of less granular data. Surveys targeted at DPE can be limited in their representativeness, but they can provide more in-depth information about the extent to which

these workers rely on income from platforms, their working habits, working conditions and well-being compared to traditional statistical approaches.

The following sections describe strategies for collecting such data, provide international examples and draw lessons learned on each of them.

Traditional statistical surveys

Labour Force Surveys and Household Income and Budget Surveys

Traditional, representative surveys that can be used to identify DPE include national labour force surveys and household income and budget surveys. Given the structure of these surveys, the identification of DPEs is only possible if explicit questions are asked about working on or earning an income from platforms. The standard questions in labour force surveys (as shown in the Annex 3) usually allow for identifying NSFE or the self-employed by establishing the characteristics of the work relationship, such as contract typology or hours worked. Hence, DPEs as such cannot be distinguished. Moreover, if the respondent does not consider their activity on platforms as employment (which may be the case if they only provide services on an ad hoc basis or in addition to their primary employment), the survey will identify them as inactive and questions related to employment will be skipped. Finally, if LFS uses a short reference period it might not pick up sporadic employment that is conducted occasionally. However, in a continuous survey this would be a reduced problem.

At this time, only a handful of countries have incorporated specific questions on digital platform employment into their surveys, including Canada, China, Denmark, Finland, and the United States (see the Annex 3 for an overview). The majority of countries have done so by adding an ad hoc module on alternative forms of employment (including DPE) to their parent labour force surveys (Tinonin forthcoming). Only China and the United States have added recurrent questions to their main survey questionnaire. The National Bureau of Statistics of China publishes their survey questions online.¹³ The questions related to platform work are reproduced below:

Table 1 Questions on platform work, China Labour Force Survey

-
27. Do you have any business that you undertake via the Internet?
- ① Yes
- ② No → Question 28
- 27.1 Which of the following are you mainly engaged in?
- To undertake production orders (such as physical production, software programming)
 - Commodity transactions (such as WeChat, Taobao)
 - Financial services (such as Internet microfinance, Internet insurance agency)
 - Car service (such as express, special car-hailing, chauffeuring)
 - Logistics services (such as food delivery, express delivery, freight, errands)
 - Living services (such as catering, housekeeping, family hotels, farmhouses)
 - Knowledge, skills, entertainment, advertising and other services (such as online education, medical treatment, consulting, online editing, online maintenance)
 - Others (please specify)
-

Source: China Labour Force Survey, 2020

¹³ Pages 9 (questions) and 29 (explanation): http://www.stats.gov.cn/tjsj/tjzd/gjtjzd/202006/t20200619_1769484.html

Statistical offices typically have two¹⁴ approaches to measuring work in labour force surveys, including digital platform employment, namely the *source of income-based* and the *job-based* approaches¹⁵. An income-based approach means that respondents are asked whether they have gained income from DPE in the reference period. The income-based identification of platform workers usually uses a long reference period of 12 months, as the following example shows:

Table 2 Questions to identify platform workers, Swiss LFS

Question	Answer
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.	1 Yes 2 No
Have you rented a room, apartment or a house to somebody via an internet platform such as Airbnb or Flipkey in the past 12 months?	8 Don't know 9 N/A
Have you provided taxi services via an internet platform or app such as for example Uber or Lyft in the past 12 months?	1 Yes 2 No 8 Don't know 9 N/A
Have you provided other services via an internet platform such as cleaning, handiwork, delivery services or online programming in the past 12 months?	1 Yes 2 No 8 Don't know 9 N/A
What percentage of your income comes from the income from these paid services provided via an internet platform or app?	Share as % 998 Don't know 999 No answer

Source: Swiss Labour Force Survey Questionnaire 2019¹⁶

A job-based approach conceptualizes DPE as a form of employment, asking respondents whether they have engaged in this type of work in the reference period. The United States Current Population Survey's Contingent Worker Supplement uses a shorter reference period – a week. Using a longer reference period increases the share of occasional platform workers in the estimated number of DPE, but it may produce less robust results as respondents may have difficulty recalling events over such a long period. Since job-based approaches typically ask detailed questions about respondents' primary and secondary forms of employment, these surveys offer rich information of DPE (at least for observations where DPE is a primary or secondary job). The United States' Contingent Worker Supplement survey follows the job-based approach, as showed below:

Table 3 Questions to identify platform workers, US Contingent Worker Supplement Survey

Question	Answer
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?	1 Yes 2 No
Was that for (your/NAME's) (job/main job), (your/NAME's) second job)) or (other) additional work for pay?	1 Primary 2 Secondary 3 Other

¹⁴ A third approach, based on the location of work, is mentioned in Tinonin (forthcoming). However, based on discussions with key informants, the authors argue that this approach has not been endorsed by statisticians because it cannot distinguish digital DPE from teleworkers and self-employed persons who work from home.

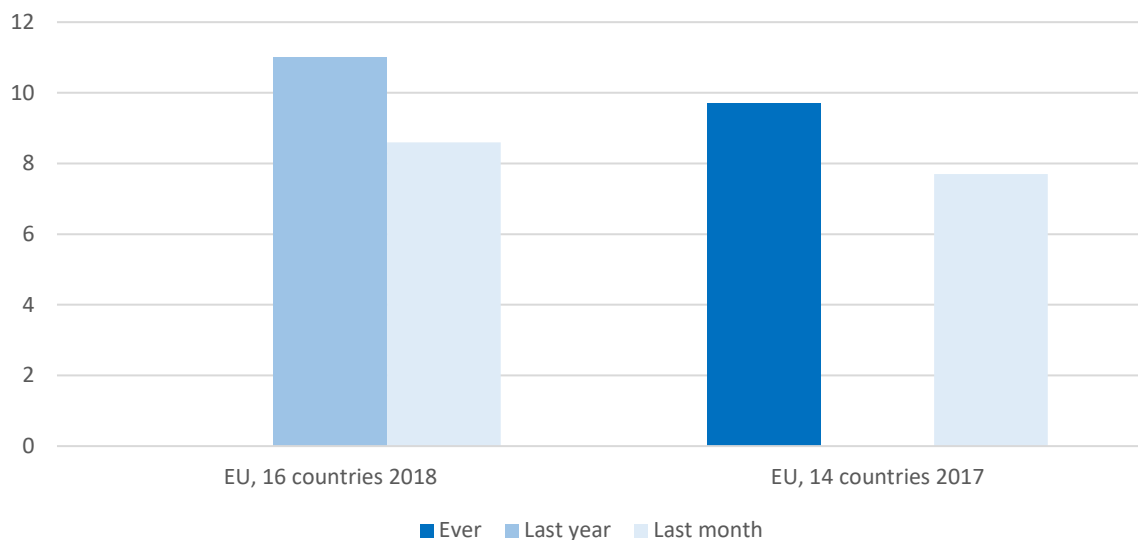
¹⁵ Key Informant Interview with the ILO's Department of Statistics.

¹⁶ Available at: <https://www.bfs.admin.ch/bfs/en/home/statistics/work-income/surveys/sifs.assetdetail.8467225.html>

Source: United States Bureau of Labour Statistics 2018

The use of different reference periods yield some differences in the estimates of DPE.

Table 4 Differences in estimates of platform work according to different reference periods



Sources: Pesole et al. (2018) and Urzi Brancati, Pesole and Fernández Macías (2020) in ILO (2021:49)

Despite reduced cost that comes with adding modules to ongoing research, even though the sample size of labour force surveys is typically very large, they will nevertheless lack statistical precision about specific characteristics of very small groups in the population such as platform workers, at least in the European context.

According to key informant interviews, Eurostat, the European Commission's statistical directorate is planning to add an ad hoc module on DPE to the European Labour Force Survey (EU-LFS). The module is currently under development by a dedicated task force and will be tested in a number of member states in 2020/21. Eurostat plans to combine the job- and income-based approaches in their questionnaire, arguing that the two could meaningfully complement each other. Due to the flexible nature of DPE, workers may join and leave platforms dynamically. The long reference periods of the income-based approach would therefore identify DPEs even those who used platforms occasionally in the past year. The job-based approach will complement it with information regarding those who have carried out DPE in the reference week. Therefore, the combined approach will make it possible to relate the frequency of DPE with general employment information, as well as link it to information about the person's primary or secondary to the persons "main job and/or second job".

ICT-Surveys

The ILO's efforts to map out national strategies to measuring DPE found that surveys on internet usage are the second major source of such information in the European Union (Tinonin forthcoming). According to the corresponding desk review, 10 member states have adopted Eurostat's model questionnaire on ICT Usage in Households and by Individuals between 2014 and 2019: Denmark, Finland, Germany, Greece, Ireland, the Netherlands, Poland, Slovenia, Spain and Sweden. These surveys measure the population's access to and use of technology and the internet, and two questions relate to DPE (Eurostat 2019):

Table 5 Questions on DPE in Eurostat's model questionnaire on ICT use

Question	Answers
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 agencies are excluded.	1 Yes 2 No
If YES: Could you please specify if this work is:	<input type="checkbox"/>
a) The main source of your income	<input type="checkbox"/>
b) An additional source of income	

Source: Eurostat (2019): Eurostat model questionnaire for ICT Usage in Households and by Individuals

Including such questions in ICT-surveys can prove useful in estimating the incidence of DPE and may be triangulated with estimates from labour force surveys and administrative sources. However, since these surveys do not focus on employment per se, they provide minimal insight into workers' characteristic and conditions.

Lessons learned from representative surveys

Surveys about the labour force or the population's ICT usage are useful sources of information on the incidence of digital platform employment. However, these surveys have limitations and challenges in generating robust and comparable information on DPE.

First, understanding what is meant by DPE is a challenge for not only statisticians, but also respondents. This is demonstrated by experience from the US Bureau of Labour Statistics: many survey respondents did not understand the definition of digital platform employment provided in the questionnaire. Overreporting was so high that removing obviously false positive¹⁷ cases reduced the estimated share of the workforce engaged in digital platform employment from 3.3% to 1% (Bureau of Labour Statistics 2018). Testing the understandability and answerability of questions by potential respondents prior to the survey implementation, called cognitive testing, is important but to maximize success but does not guarantee it. The BLS, for instance, did two rounds of cognitive testing before their main field work, but still concluded after survey implementation that the questions did not work as intended. Respondents' understanding of what is meant under digital platform employment may be aided by naming specific companies that are prevalent in the country, as in the Rand-Princeton American Life Panel Survey (Katz and Krueger 2019), the Finnish Labour Force Survey (Statistics Finland 2018), or Eurostat's model questionnaire for ICT Usage in Households and by Individuals¹⁸. However, as the US Bureau of Labour Statistics (2018) notes, naming specific platforms may result in false negatives by workers mediated through companies other than those listed in the question.

Table 6 Options to explain the concept of DPE to respondents from selected surveys

Survey	Question	Answers
US BLS Current Population Survey (2017)	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.	1 Yes 2 No 3 Don't know

¹⁷ For instance, hairdressers and police officers reporting that they worked entirely through an online platform.

¹⁸ Model questionnaires are available at: <https://circabc.europa.eu/faces/jsp/extension/wai/navigation/container.jsp>

American Life Panel Survey (2018)	Did any of those gigs, HITS or other paid jobs you worked on last week involve working through an online app, such as TaskRabbit or Uber?	1 Yes 2 No
Eurostat model questionnaire for ICT Usage in Households and by Individuals (2019)	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 agencies are excluded.	1 Yes 2 No
Finnish Labour Force Survey (2017)	Have you during the past 12 months worked or otherwise earned income through the following platforms?	1 Airbnb 2 Uber 3Tori.fi/Huuto.net 4 Solved 5 Some other 6 None of the above
DIW German Socio-Economic Panel Survey (2020)	The Internet offers many opportunities to earn an income without employment or to complement your income, for example, by selling goods on a website or an app, renting your property or providing services. How about you? Have you used an app since January 2019 to: Q105 sell goods (used/new/self-made)? Q109 rent out property (room, property or car)? Q113 perform services (repairing, crafting, errands or programming).	1 Yes 2 No

Source: questionnaires marked in the left column.

As O'Farrell and Montagnier (2020) note, and was emphasized in key informant interviews, problems of sample size hinder surveys' ability to provide detailed information on this population group. Since the share of DPE is small in the overall workforce, the number of observations in survey samples will inherently be low as well (even in large-sample labour force surveys). This limits the reliability of descriptive statistics on digital platform workers' characteristics and working conditions, including their access to social security.

Targeted surveys

Recent years have seen a surge of interest in the characteristics and working conditions of digital platform workers among academic institutions, international organizations and think tanks. Recognizing the limitations of traditional, representative survey methods, researchers have administered surveys that target platform workers a) directly through the platform companies or b) by circulating surveys on other online arrays.

Surveys administered through platforms companies

The first ILO Survey of Crowdtwork (Berg, 2016) was implemented in 2015 targeting two major labour platforms: CrowdFlower and Amazon Mechanical Turk (AMT). It sampled 1,167 respondents from the United States and India by posting the survey as a task on the platforms and paying workers 1 USD for the first and 3 USD for the second survey round. Beyond collecting demographic information and questions from standard labour force surveys¹⁹, the ILO survey

¹⁹ Such as hours worked, primary or secondary employment etc.

asked workers about their income security, access to social security, and what they enjoy and would change about the platforms they work on. The results highlighted one of the challenges of measuring (and conceptualizing) social protection for DPE: the large discrepancy between social protection coverage of those whose main job is on the digital platform and those who are also in standard employment. Those who rely on platforms as their main source of income are in a more volatile situation: only 9.4% contributed to the Social Security Fund compared to 77% among those with another job (Berg 2016). A lesson learned for measuring digital platform workers' social protection is that being covered does not automatically mean that the coverage is related to DPE, as workers may obtain social security coverage through other activities. Questions may have to go more in depth and ask specifically about which source of income the contributions are tied to. Berg and Rani (2018) repeated the ILO Survey of Crowdwork on a larger sample (N=3,345) including more work platforms (AMT, Crowdfunder, Prolific, Clickworker, Microworkers) and workers from more countries in 2017.

In 2020, the ILO administered surveys to 12,000 workers, 70 traditional companies, 16 platform companies and 14 platform worker associations across 100 countries – resulting in the most comprehensive report on this topic to date (ILO, 2021)²⁰. Sampling and recruitment were done in a variety of ways, including through online applications as well as traditional offline survey methods. Like the ILO's previous efforts to collect data on digital platform workers, surveys asked about demographic characteristics, working conditions and access to social security. They employed a combination of quantitative and qualitative questions. The report sheds light on how the COVID-19 pandemic impacted the world of work. While labour supply on digital platforms has risen sharply in 2020, demand has decreased and shifted toward tasks related to software development and technology. Excess labour supply on platforms has led to competition among workers, which pushes wages downward as workers “race to the bottom” for tasks.

Hall and Krueger (2017) used a survey²¹ of over 600 Uber drivers in the United States, and combined survey data with the platform's anonymized administrative records on drivers. It was administered through the Uber app to understand drivers' characteristics, motivations for partnering with the company, and to contrast their demographic characteristics with those of other workers captured in other, representative surveys.

A research study commissioned by the ILO targeted the workers of three major digital labour platforms in China (J. P. Chen 2020). Workers who met the eligibility criteria (being 18 years of age and being registered on the platform for at least three months) could accept the task of filling out the survey that was posted on each of the three platforms. An incentive of 20 CNY (approximately 2.8 USD) was paid upon completion of the questionnaire.

According to ILO (2021:51), the lack of common definition and methodological approaches, as well as lack of transparency on the part of the platforms are obstacles to estimating the number of workers whose work is mediated through digital labour platforms. This calls for digital labour platforms to be transparent and disclose the number of active workers whose work is mediated through them.

Online circulated surveys

Taking a different strategy to recruit respondents, the Chinese Academy of Labour and Social Security (CALSS.2019) circulated an online survey on a major Chinese questionnaire platform

²⁰ https://www.ilo.org/global/research/global-reports/weso/2021/WCMS_771749/lang--en/index.htm

²¹ The survey was conducted by the Benson Survey Group with more information available on: <https://www.bsgco.com/uber>

called Wenjuanxing in 2019. A total of 2,148 questionnaires were issued. The distribution targets included five types of platform workers: platform enterprise employees, employees of third-party agencies dispatched to carry out platform work (such as online car hailing drivers, couriers, etc.), platform-based individual store owners, platform-based individual store staff, and other platform workers (such as WeChat public account operators, webcasters, etc.)²².

Another study (Liu and Chen 2020) used a mixed approach with online recruiting and interviewing and more traditional snowballing recruitment and face-to-face interviewing. They applied a three-month survey,²³ to four types of e-employees (food delivery workers, couriers, ride-hailing drivers and e-commerce workers) in three cities in China (Beijing, Hangzhou and Chengdu). The research was carried out from July to September of 2018. Since most platform workers did not have a fixed workplace, it was difficult to use a random sampling method. Instead, they searched for respondents by placing orders on the phone and online, and explained to them the purpose of the research. The first 12 people (one person in each occupation within each city) who agreed to fill in the questionnaire then became the first respondents. Subsequently, a snowball approach was adopted, aimed at achieving diversity in social protection levels among respondents. In each city, 30 respondents were selected for each e-employment category, for a total of 360 respondents; 344 completed the questionnaire face-to-face and 16 completed it online at the request of the participants for their convenience.

Another report commissioned by the ILO also started with online survey combined with snowballing technique. Aleksynska, Bastrakova, and Kharchenko (2018) recruited digital platform workers in the Ukraine using three strategies: a) advertising the survey online on the three most prominent online labour platforms in Ukraine (Kabanchik.ua, Freelancehunt.ua and Upwork.com's Ukrainian branch) and in a Facebook group for freelancers, b) selecting participants from a directory of internet users called InPoll, and c) snow-balling (with respondents providing referrals to other potential participants). Overall, 1,009 observations were retained, and the survey questionnaire was a version of the ILO Crowdworker Survey adapted to the Ukrainian context.

Semi-targeted surveys

Other surveys lie between traditional, large surveys and targeted surveys in that they do focus on the digital economy but also aim to be representative at least of the working age internet users of the country. The COLLEEM survey, a behavioral study on extending social protection for all types of employment commissioned by the European Commission, and the gig economy surveys of Chartered Institute of Personnel and Development (CIPD) are further examples of large-scale, online circulated surveys with the specific aim to gather information on the digital economy, including (but not limited to) DPE.

The COLLEEM survey was commissioned by the European Union to fill data gaps on the incidence and characteristics of digital platform employment (Pesole et al. 2018). It used a sampling from a commercially available list of internet users in 14 EU member states and collected information from over 32,389 respondents in 2017 (Brancati et al. 2019; Pesole et al. 2018). The COLLEEM survey takes an income-based approach to singling out platform employment, using an open reference period (*have you ever*) and differentiating between different activities that can be

²² https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo-beijing/documents/briefingnote/wcms_769026.pdf

²³

https://www.researchgate.net/publication/340736995_The_disembedded_digital_economy_Social_protection_for_new_economy_employment_in_China/link/5e9eafd6a6fdcca7892beb70/download

performed via apps. While questionnaire does list activities such as selling and renting out goods and property, the analysis only considers those providing services (including financial services) and performing tasks as digital platform employment (Tinonin forthcoming).

The survey of this study applied a non-proportional stratified randomized sampling to better capture the people in non-standard employment, and specifically compared the differences in access to social protection for people in unemployment, standard employment, and NSFE, including DPE and self-employment. The survey gathered information from over 8,000 respondents in 10 European countries, including questions as the knowledge on social protection policy, decision between job selection and social protection coverage and so on. The results show that young people and people in NSFE are more disadvantaged in social protection coverage than their counterparts. A second survey COLLEEM II (Urzi Brancati, M.C., Pesole, A., Fernández-Macías, E. 2020) implemented in 2018 gathered a total of 38,022 responses from internet users aged between 16 and 74 years old in 16 EU Member States. A longitudinal component was added to COLLEEM II that allowed to analyse individual transitions in and out of platform work. By focusing on those who were platform workers in 2017 and were re-interviewed in 2018, it found that 41.4% remained platform workers as opposed to 58.6% who dropped out; the drop-out rates are therefore rather high and suggest that many people may just be trying out platform work, but do not find it rewarding enough to do it for a long time. By digging deeper in the longitudinal sub-sample, the survey found that platforms mediating transportation services have a higher turnover rate than those who mediate professional online services or mediate microwork.

CIPD, a human resources organization located in the United Kingdom, sent out a survey questionnaire to a nationally representative sample of working age adults. To overcome the sample size limitations discussed with regards to traditional representative surveys, CIPD boosted the size of the sample group that works in the *gig economy*²⁴ (CIPD 2017). This allowed them to do a more detailed analysis on the characteristics and trade-offs of digital platform employment. CIPD's survey uses a job-based approach to identify platform workers.

Lessons learned from targeted surveys

Targeted surveys, especially those administered online, have various advantages over traditional, representative statistics to carry out more in-depth studies regarding the situation and characteristics of workers in DPE. Targeting at DPEs resolves problems of sample size caused by the small share of this group in the overall labour force. Reaching crowd-workers through the platforms they already use is also practical and convenient²⁵, and likely to be more cost- and time-efficient. Popular platforms can facilitate access to a large pool of potential respondents, for example, Amazon Mechanical Turk has an estimated 100,000 monthly active workers that can be reached by researchers (Difallah, Filatova, and Ipeirotis 2018). It comes as no surprise that several other studies have targeted AMT workers with different objectives: to understand the demographics of workers (Difallah, Filatova, and Ipeirotis 2018; Ipeirotis 2010), to analyze labour relations (Irani 2015), to understand workers' motivation (Gupta et al. 2014) or to measure job satisfaction (Brawley and Pury 2016).

On the other hand, targeted surveys (especially those administered via the platform or other online arrays) come with their own challenges. They are not representative of the working age population, nor do they provide a random sample of those engaged in digital platform employment. Selection biases are two-fold: first, only workers from the selected platforms will be

²⁴ CIPD used the term gig economy, but they conceptualizes this as digital platform workers except for those who use platforms solely to sell goods or to rent their property.

²⁵ Key Informant Interview with a Senior Economist from the ILO.

included in the sample; second, certain subgroups of workers may be more or less likely to complete short, non-specialized tasks such as the completion of a research survey. There are two contradictory findings regarding the biases. Aleksynska et al (2018) warn that earnings estimates should be interpreted as a lower bound because workers charging higher rates might be less inclined to participate. However the COLLEEM study already mentioned found the opposite: authors argue that it over-represents high frequency internet users and over-samples professional (and thus more privileged) platform workers (Brancati, Pesole, Fernández-Macías, 2020:6). Although the survey was conducted online, the authors considered this appropriate as internet use is a prerequisite for being a platform worker. Potential self-selection bias was corrected for 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, the authors found that the reliability of the answers and quality of the online panels used to conduct the survey were not always as good as they had hoped for (Brancati, Pesole, Fernández-Macías, 2020:6).

Experience from the ILO Surveys of Crowdtwork (Berg 2016; Berg and Rani 2018) illustrates potential challenges with the quality of responses²⁶. First, respondents in an uncontrolled environment may pay limited attention or even use a bot to complete the questionnaire. Berg and Rani (2018) introduced several ways to test whether respondents are paying attention to the survey, which indicates the quality of responses. These tests were questions where the correct answer would be obvious to any attentive respondent. Observations with incorrect answers to these questions were removed from the sample. Chen (forthcoming) added fake digital platforms in their questionnaires as an attention check where respondents could select the platforms they are aware of or have worked with. Second, the payment offered for the survey may incentivize the same worker to complete the questionnaire more than one time. Individuals who provided multiple submissions were identified based on similarities in e-mail addresses, the web browser used, demographic data and their textual answers in the ILO Surveys of Crowdtwork. Aleksynska et al (2018) regularly checked participants' IP addresses to identify multiple submissions.

Administrative data

There have also been efforts to use administrative data to observe the incidence of digital platform employment or the behaviors of workers. Whilst administrative data offer a less onerous solution to data collection, there are important limitations to using such data. A generic limitation for policy is that administrative data usually contains information on those groups of the population that are covered but not on those who are not covered. While, combined with survey data it can be used to estimate the extent of coverage, it usually does not provide any insights on the causes and effects of non-coverage. Eligible non-recipients usually are not captured²⁷. It may also not be possible to identify DPE in registers because their income is below certain thresholds. Another major difficulty is that tax or social security administrative data records do not usually tag individual data records as working in platform mediated activities or in flexible employment, and this is an area that could be improved. Abraham et al (2018) note that tax data on self-employment could theoretically be used to triangulate information gathered from survey data,

²⁶ The ILO also conducted an online survey on web-based platforms in August 2019 that included 1,174 samples from the country's top-three online platforms, as determined by their Alexa ranking and Baidu weight: ZBJ.com, EWPK.com and 680.com. The ILO also conducted an online questionnaire on 711 Meituan food delivery riders in Beijing in June and July 2019. See Flexible Labour to "Sticky Labour": A Tracking Survey of Workers in the Food-delivery Platform Economy of China (ILO 2020) and Online Digital Labour Platforms in China: Working Conditions, Policy Issues and Prospects (ILO 2020).

²⁷ https://www.ilo.org/wcmsp5/groups/public/---americas/---ro-lima/---sro-port_of_spain/documents/presentation/wcms_304853.pdf

but estimates between administrative and survey data are more often than not inconsistent. Katz and Krueger (2019) also find discrepancies between tax records and survey estimates. Partnerships with online platforms to improve tax collection have the potential to improve administrative data sources but workers represented in tax registers exclude information of those below tax thresholds. There is also need to obtain consent from tax payers to share their data, which can lead to selection bias.

Administrative data can also be collected from the specific platforms themselves. This has been done with Uber's data on surge pricing and worker supply by Chen and Sheldon (2015) and on drivers' demographics by Hall and Krueger(2017) (see section on surveys administered through platform companies above). Company administrative data have shortcomings that may affect the measurement of platform workers. For example, there may be double counting as one same person may be registered in different companies. The objectives of the administrative data sets are not always useful for statistical purposes and monitoring social and work conditions, and some critical information data may not be collected unless negotiated with the companies. It is also only made available subject to company policies and their agreement to release the data.

Alternative sources and big data

Finally, the OECD (2019) highlights the potential of alternative, large datasets to fill knowledge gaps in digital platform employment and the characteristics of workers. JPMorgan Chase Institute published "The Online Platform Economy in 2018 "report (Farrell, Greig, and Hamoudi 2018), based on a sample of 39 million checking accounts, and their 38 million payments through 128 online platforms from October 2012 to March 2018 in 23 states and 16 cities from the USA. The study classified the online platform economy into four categories, transportation, non-transportation work, selling and leasing sectors²⁸. From the documented transactions, it shows that the online platform economy has been growing between 2013 to 2018, however, not considered large enough to replace the traditional sources of household income. During the observed period, the average platform earnings represented only 20 percent of total take-home income of the sampled families that have participated in the Online Platform Economy, while the top earners are in the leasing sectors, not considered as platform employees by most standards. As for the freelance driving sector, the study found that it is merely a part-time job for most participants. What is more, the growing participation in transportation sector increased the competitiveness among drivers and resulted in dropping in average earnings, from \$ 1,500 in 2013 to \$762 in 2018. As a result of the flexible platform employment commitment and the decrease in income reward, the turnover rate of Online Platform Economy engagement is very high and while participating in Online Platform employment, 20 percent of the drivers also sign up on multiple platforms simultaneously to generate more income (Farrell and Greig, 2016; Mishel, 2018). These findings shed a new light on the complexity of the situation and the need for any definition of platform work to be relevant in different national contexts.

Coming from a global perspective, the Oxford Internet Institute advocates that building an international Online Labour Index (OLI) is necessary to understand the way that gig economy functions (Kässi and Lehdonvirta 2016). Conventional labour market surveys have natural limitations in offering sufficient, timely information of the constantly changing digital platform employment that confines what researchers can study on the topic. The solution lies in the problem. By using application programming interfaces (APIs) and web scraping techniques, Kässi and Lehdonvirta (2016) show a way to collect real-time online labour market data to measure the

²⁸ Non-transport work includes services like dog walking, home repair, etc. Selling sector refers to the independent sellers who uses online marketplaces to find customers for their products. Leasing sector includes the lessors who rent homes, parking spaces and other types of assets via online platforms.

supply and demand of platform employment worldwide and establish the OLI²⁹. By doing so, researchers and policy makers can have more resources to better understand the skill-job matching mechanism and how the online labour market impacts international economies.

Why are standards on measuring new forms of employment and platform economy important?

The ILO Social Protection Floors Recommendation, 2012 (No. 202) advises States (Art 22) that in developing or revising the concepts, definitions and methodology used in the production of social security data, statistics and indicators, member countries should take into consideration relevant guidance provided by the ILO, in particular, as appropriate, the resolution concerning the development of social security statistics adopted by the Ninth International Conference of Labour Statisticians. The 2018 International Conference of Labour Statisticians identified the need to refine and harmonize statistical frameworks on work relationships. The proceeding agreement, Resolution 1, recognizes the importance of standards for monitoring new types of work relationships, with intermediated work³⁰ being one of the priority areas (ICLS, 2018). The resolution is an important step forward as the measurement of digital platform employment is hampered not only by slow progress in adopting statistical practices but also by the lack of common terminology.

A forthcoming desk review commissioned by the ILO notes that the absence of harmonized terminology undermines countries' ability to collect comparable and sound data since it is unclear what these concepts are supposed to measure (Tinonin, forthcoming). For instance, some statistical offices count only the provision of services (such as completing online tasks, driving etc.), while others consider selling goods (on virtual marketplaces like Etsy) or renting out assets (e.g. Airbnb) as digital platform employment.

ILO-EU-OECD Technical Expert Group Draft Handbook on the Measurement of Platform Employment

An ILO-EU-OECD Technical Expert Group on measuring platform work was created in September 2019 to provide guidance on concepts and measurement approaches. These organisations are currently developing a handbook on measuring digital platform employment, which will essentially be a guide to operationalizing Resolution 1's corresponding points. The conceptual work by the Technical Expert Group will inform the pilot testing planned by several European Statistical Offices in the context of the Eurostat Labour Market Statistics Task Force. The handbook will include a common conceptual framework and terminology to harmonize the work of statistical offices in participating countries and provide guidance based on international experience and best practices.

Source: key informant interviews.

Despite the increasing attention being paid to platform work, there is currently no agreed definition (O'Farrell and Montagnier 2019:130). Differences in concepts and definitions lead to little consistency of estimates between studies and geographical areas. The stability of definitions for comparability over time is also important. The COLLEEM II study kept the same definition of platform workers in both waves of the survey to ensure robustness in the analysis of trends.

²⁹ More to see on <http://ilabour.oii.ox.ac.uk/online-labour-index/>

³⁰ Where digital platform employment, or employment intermediated via a digital platform, is included.

Comparability of findings is also made difficult by the use of different sampling methods: use of platform company databases, or alternatively commercial databases established by professional surveying companies (such as COLLEEM) or recruiting participants through online postings and using snowballing techniques lead to different biases. Another source of discrepancy is the use of a definition or not to help respondents understand what is meant by platform work and in case it is used, the fact that the definition may vary. The terminology used in the question probing existence of platform work is important. For example, it was observed that inquiring if a participant had offered, or instead provided a service yielded significant variations in the size of platform workers. The COLLEEM Study II found that one of the reasons for this may be that many first time would be platform workers are soon discouraged and quit. Instead of a definition, most official surveys give respondents named examples of online platforms to aid understanding of work platforms. However, this may reduce comparability over time and across different countries. Another issue is whether the question is broad enough to include those who perform occasional platform work for secondary income or focuses on earnings from the main job. As already indicated in this review, the chosen reference period is also critical. Some surveys use one week, others twelve months, and others an open reference period (*Have you ever?*). The longer time horizons yield include more cases of occasional platform work.

As a result of different approaches, estimates may vary widely³¹. For that reason, as indicated, Eurostat, the European Commission's statistical directorate is planning to add an ad hoc module on digital platform employment to the European Labour Force Survey (EU-LFS). The module is currently under development by a dedicated task force and will be tested in a number of member states in 2020/21.

Application of survey good practices to the study on 'Assessing Coverage of Social Security for Platform Workers in China' by the Chinese Academy of Labour and Social Security (2020-2021)

The ILO initiated a survey at the request of MOHRSS and its Social Insurance Administration (SIA) as part of its Research assessing social security coverage of workers in NSFE. SIA was specifically interested in focusing on workers in the platform economy. The study is conducted by the Chinese Academy of Labour and Social Security (CALSS) of MOHRSS. This section describes existing research on platform industry and employment in China, some of its limitations and presents the CALSS research design. Finally, it compares it with the good practices of surveying platform workers identified in this review.

In China, statistics on work in digital platforms are produced annually by the State Information Center of the National Development and Reform Commission in its annual Development of China's sharing economy Report³². However, the report focuses on technology and business indicators. Several platform companies including Didi, Meituan³³ and Alibaba³⁴ have their own research institutes that produce regular reports on developments in the platform economy. They use a combination of research methods and data sources. For example, the report "An insight report on the life and work of a small service shop owner" by Meituan Research Institute applied

³¹ <https://www.oecd.org/going-digital/mdt-roadmap-platform-workers.pdf>

³² <https://recordtrend.com/research-report/report-on-the-development-of-chinas-sharing-economy-in-2021-from-ministry-of-information-industry/>

³³ <https://about.meituan.com/research/home>

³⁴ <http://www.aliresearch.com/EN/index> See for example Measurement of Employment Opportunities Derived from Alibaba Retail Platform and Report on The Development of E-commerce: Experience from China Alibaba and World Bank <http://www.aliresearch.com/en/Reports/Reportsdetails?articleCode=21831> and <http://www.aliresearch.com/en/Reports/Reportsdetails?articleCode=52915780756574208>

9,342 questionnaires to grasp working conditions of small service shop owners and make policy recommendations. Based on records from its data base, the same institute produced the report “China's food delivery industry development report in 2019 and the first half of 2020”. Alibaba and the World Bank estimated the size of e-commerce employment and levels of income in the report “The Development of E-commerce: Experience from China” drawing on a variety of data sources, including a micro survey and aggregate transaction data from the Alibaba platform.

On the side of data specifically produced by or on behalf of policy makers in the field of labour and social insurance, China's National Bureau of Statistics of China adds recurrent questions on the platform economy to their main Labour Force Survey questionnaire.³⁵ However, the data on platform economy is not available on the annual Statistical Yearbooks that present labour statistics. Provincial governments and MOHRSS conduct surveys from time to time, but there is no harmonized methodology and comparable data is usually not available for results between provinces.

At the request of MOHRSS and ILO, CALSS developed a semi-targeted online circulated survey with the aim to gather information on NSFE, with specific questions but not limited to employment in the platform economy, an objective similar to COLLEEM II. The sampling method is also similar to COLLEEM II. First, CALSS uses a survey company specialized in offline and online survey methods to source the database. The entries to the database are sourced from stored data of past survey, other online surveying companies and data from platform companies. The database has a total 6 million data records to date. The attributes of records include gender, age, educational background, monthly income, city of residence, job and other information. A subset of the database was constituted by a series of filters that exclude full-time standard workers, as well as unemployed and retired who do not undertake any platform mediated activity. Based on those records and upon approval of the individuals, the information of targeted population is entered into the sample database. A non-proportional stratified sampling is used to obtain a higher representation of certain groups of workers in NSFE and platform workers including a good geographical representation.

According to good practices identified in the review, when asking whether a person is a platform worker, it is necessary that respondents have an understanding of platform workers that is robust to changes in legal rulings and the entry to or exit from platforms. The survey by CALSS rightly avoids a definition of platform work as this could evolve later according to changes in regulations. The survey can thus be more easily replicated over time. It also does not ask the participant if he is a platform worker, because of subjective differences in understanding of the term and the biases that it could introduce. It prefers a description of types of activities mediated by platform companies instead of providing actual names of companies as this ensures better comparability between provinces and even internationally.

The review identified that surveys tend to ask whether the worker provided effectively a service, implying the worker completed a commercial transaction. This is a preferred question to “offer” a service which leaves ambiguity as to whether a transaction was completed. That is the case in this survey. Specifically, the question used is: “Do you perform any of these work related activities?” referring not to an offer but to the provision of the service. In addition, the Canadian LFS asks whether the respondent offered a service (and not necessarily provided) but does not mention the earning of income, meaning the survey could include those who offered a service for

³⁵ Pages 9 (questions) and 29 (explanation): http://www.stats.gov.cn/tjsj/tjzd/gjtjzd/202006/t20200619_1769484.html

charitable reasons, and did not complete a commercial transaction. The current survey verifies that income was effectively earned from platform activities.

The coming Eurostat survey plans to combine job-based approaches (*do you provide ... as your main activity...*) and income-based approaches (*how much of your income is derived from...*) in their questionnaire, arguing that the two could meaningfully complement each other. This approach is also followed in the questionnaire by CALSS. Contrary to the French LFS that excludes those who perform platform work as a secondary job (by means of a series of filter questions), the CALSS survey adds a job-based approach to ask more detail about respondents' primary and secondary forms of employment, and does not restrict the possibility of platform work to primary employment.

Labour force surveys typically ask for a respondents' employment status in the past reference week. USA also used this reference period for measuring DPE while others decided to use a twelve months period (Canadian, Danish, and Finnish LFS). Digital platform employment during the reference week allows to link to employment rates etc. Digital platform employment carried out during the last 12 months gives 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. These are two complementary approaches.

Whilst COLLEM I did not use any reference period (*"What is your current employment status?" and "Do you actively participate in the online economy by using online platforms to help generate income?"*), COLLEM II uses an open reference period (*Have you ever*). CALSS however uses a more conservative approach. It does not have any reference period (*"Do you perform..."*). This may underestimate platform work, especially occasional gig work which would have been seen in larger time frame. However, it can also be argued that the number of hours dedicated to platform work is more relevant than then frequency someone works on a platform. The survey does evaluate the number of hours dedicated to platform work by asking: *"What percentage of your monthly working time do you spend on the platform work each month? (Working time on the platform refers to the time spent on selling or providing services on the platform, including that actual service delivery time and waiting time, etc.)"*. The survey also provides an estimate of the length of work in platform work.

The survey includes questions that are specific to China such as if there is coincidence of the place of residence and the place of employment. This helps identify the number of internal migrant workers engaged in platform work and their origin. COLLEEM 2018 data also collects data on the nationality of platform workers which can help identify if they are working in another country of the EU or are originally from a third country.

In summary, the CALSS survey template provides a very good basis for collecting data on employment and social security on platform workers that meets many good practices identified in the international review of surveying instruments.

Contribution of the research 'Assessing Coverage of Social Security for Platform workers in China' to a monitoring framework on social security coverage of non-standard forms of employment and platform workers

This section focuses on the different instruments used as part of the research 'Assessing Coverage of Social Security for Platform workers in China' as a source of data and information contributing to

a monitoring framework on social security coverage of workers in non-standard forms of employment and in platform work.

For the ILO, social security covers all measures providing benefits whether in cash or in kind, to secure protection, inter alia, from (a) lack of work-related income (or insufficient income) caused by sickness, disability, maternity, employment injury, unemployment, old age, or death of a family member; (b) lack of access or unaffordable access to health care; (c) insufficient family support, particularly for children and adult dependants; (d) general poverty and social exclusion. China's legislation identifies particularly 5 social insurance branches (medical care, employment injury, unemployment benefits, maternity health care and cash benefits and old age benefits) + housing benefits. In addition China has a number of social assistance instruments which are available for poor people such as Dibao (the minimum living guarantee programme). During the epidemic some unemployed workers benefited from protection by Dibao. To thoroughly and comprehensively assess social security coverage of workers in NSFE the monitoring framework should ideally apply at least to all social security branches legally covered in the country. This means that it would also include core social assistance instruments. In addition, in the case of China, it should specifically include housing benefits. Although not constituted as a branch under social security legislation. Paid sick leave is provided under labour law as an employer liability and its enjoyment could also be monitored. CALSS survey adopts a comprehensive approach to social security trying to identify cover of a broad set of risks but does not include social assistance and paid sick leave. Extensions of the survey undertaken for this particular project could therefore be considered for a comprehensive monitoring instrument.

The following table describes the definitions of core indicators contained in the 0 version monitoring framework tried in 2020³⁶ in European member states. For comparison, ILO definitions and indicator guidelines are added.

Table 7 Social security performance indicators

	EU	ILO
Legal coverage	"Situation in a specific social protection branch (e.g. old age, unemployment protection, maternity or paternity protection) where the existing legislation or collective agreement states that the individuals in a group are entitled to participate in a social protection scheme covering a specific branch."	Number of branches of social security by which – according to existing legislation – a population or its specific groups is covered. The list of the nine branches covered by ILO Convention No. 102 may be used as a comparator.
Effective coverage	"A situation in a specific social protection branch where the individuals in a group have an opportunity to accrue benefits and the ability, in the event that the corresponding risk materialises, to access a given level of benefits."	Share of employed persons who contribute to social insurance for a specified contingency, and are thus likely to receive benefits when needed, e.g. an old-age pension on reaching retirement age. Disaggregation: Male/female; Urban/rural; status in employment Number of beneficiaries of - Disability benefits - Maternity benefits - Sickness

³⁶ <https://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=8358&furtherPubs=yes>

		benefits - Employment injury benefits - etc.
Adequacy of benefits	"Where a risk insured by social protection schemes for workers and for the self-employed occurs, Member States are recommended to ensure that schemes provide an adequate level of protection to their members in timely manner and in line with national circumstances, maintaining a decent standard of living and providing appropriate income replacement, while always preventing those members from falling into poverty. When assessing adequacy, the Member State's social protection system needs to be taken into account as a whole."	Average monthly benefit collected for each individual branch/scheme.
Weight of contributions	"Member States are recommended to ensure that the contributions to social protection are proportionate to the contributory capacity of workers and the self-employed."	Contributions are not harmful for people of lower means.

Source: Authors' elaboration

The legal coverage of social security includes a detailed description of the conditions for entitlement such as exclusions of categories of workers, and qualifying conditions such as waiting periods³⁷.

Analysing the social security law in France, Germany, Belgium, Netherlands and the United Kingdom in 2018, against the EU Council Recommendation of 8 November 2019 on access to social protection for workers and the self-employed, Shoukens et al (2018) note that: "When setting the different approaches off against the proposed Council Recommendation, countries seem to incorporate platform workers in their existing systems, but omit to fine-tune the existing schemes around the specific working conditions of platform work, which are, by nature, flexible. The main adaptation so far has been the creation of income thresholds for determining the professional character of activities performed as platform work".

Source: Shoukens, Barrio and Montebovi (2018:238)

The effective coverage includes two indicators. The first measures numbers of contributors. Not all of these end up not receiving benefits when needed if the eligibility conditions are not fulfilled. So it is important to assess those who are effectively receiving a benefit if they are affected by a risk.

Often forgotten but very important is the dimension of Benefit Adequacy. For the ILO, universal coverage includes necessarily a dimension of adequacy of coverage³⁸. The European Commission (2018)³⁹ also suggests that the "pension adequacy triangle" should include three dimensions,

³⁷ https://socialprotection-humanrights.org/wp-content/uploads/2018/07/wcms_629864.pdf

³⁸ <https://www.social-protection.org/gimi/RessourcePDF.action?id=55517>

³⁹ European Commission. Pension Adequacy Report 2018: Current and Future Income Adequacy in Old Age in the EU (Volume1); Publications Office of the European Union: Luxembourg, 2018
<https://www.eubusiness.com/topics/social/pension-adequacy-1>

income maintenance, poverty prevention, and pension duration. For indications of benefit adequacy, replacement rate levels can be obtained from the rules applying to schemes to which eligible workers have legal entitlement to. However, in practice, practical barriers to accumulating rights (instability of jobs, volatility of income), mean that in practice they may not enjoy the same levels of benefits as a typical full-time employee. It is difficult to assess these without using administrative data sets. Administrative data sets unfortunately do not always tag individual records to various categories of non-standard form of employment and platform employment.

The following table 8 provides possible data sources for a possible monitoring framework, using the CALSS survey combined with other data sources and suggested research methods. The last column indicates whether the data has been sourced in the research “*Assessing Coverage of Social Security for Platform workers in China*”.

Table 8 Basic performance indicators and related sources for monitoring framework

Indicator	Source	Question	Sourced?
Characterisation of platform workers and workers in NSFE	CALSS Survey	What is your current main form of employment? (employee private owner, self-employed, other flexible) Dispatch or not? Full time or part time Do you perform any of these work related activities (description of several online platform mediated activities) Platform main job or secondary or both? Number of platform companies worked for	√
Legal coverage	Legislation and regulations	Collection done by questionnaire to the provincial administration	√
Effective coverage and Effectively received compensation	CALSS Survey	Which of the following social insurances are you currently enrolled? Needs for coverage? What are the main reasons why you have not participated in social insurance? Have you ever had a work injury accident? Which of the following job did you perform when the accident happened? How did you get compensation for the work-related accident?	√
Adequacy	Regulations and	Replacement rates = Theoretical Level of benefits	Administrative data does not

	Administrative data	Effective replacement rates = Study [affected by principle of equivalence, according to which a longer and more continuous working career and contribution history should be rewarded with higher benefits or a longer duration of benefits] Duration of payment Administrative data? see study	have that information See study ⁴⁰ Zhao, Li, Wang 2019
Weight of contributions	CALSS Survey	What is the proportion of your pension insurance contribution to your income? What is the level of your pension insurance contribution? Do you think the current social insurance payment burden is heavy?	√

Source: Authors

There is no readily available compilation of provincial social insurance regulations. The research team sent a questionnaire requesting information on local regulations concerning coverage of flexible workers to respondents at MOHRSS in the 10 participating provinces of the study.

Effective coverage in the survey is measured by those contributing and those not contributing to different schemes. The survey also measures the priority needs of coverage by social security branches (a dimension of intention of coverage due to the fact most of insurance schemes available for platform workers are voluntary). However the perception of risks can be improved in future editions with questions such as *"During the last twelve months has one of these risks affected the household..."* and *"Have several of the events listed below seriously affected your household's ability to pay the most necessary expenses?"*⁴¹ Effective coverage measured by having benefited from actual cover is assessed in the case of employment injury (*Have you ever had a work injury accident?* and *Which of the following job did you perform when the accident happened?* and *How did you get compensation for the work-related accident?*). These could be expanded to other risks in future editions.

A lesson learned for measuring digital platform workers' social protection internationally is that being covered does not automatically mean that the coverage is related to DPE, as workers may obtain social security coverage through other activities. CALSS survey assesses the existence of other secondary forms of employment but it does not attribute social security coverage to the primary or secondary employment. Therefore an area for improvement in the future might be to be more specific asking whether the coverage of social security is derived from platform work or not.

Finally, measuring benefit adequacy requires specific questions that were not incorporated in the data set. But more reliably, it would make use of administrative data sets that would have to be

⁴⁰ <https://ideas.repec.org/a/gam/jsusta/v11y2019i24p7196-d298355.html>

⁴¹ https://www.ilo.org/wcmsp5/groups/public/---americas/---ro-lima/---sro-port_of_spain/documents/presentation/wcms_304853.pdf

provincially specific. Indeed, In China, policies on contribution bases are not consistent, and there are huge differences in the determinants of contribution bases and entitlement conditions from province to province. To do an analyses of effective replacement rates for different forms of employment under the fund, Zhao, Li, Wang 2019 use the administrative data provided by a local social insurance agency containing all participants' historical contribution and benefit records and compute the effective replacement rate. Administrative data also allow to measure levels and duration of benefits for example for different categories of workers.

Summary and conclusions

Digital platform employment constitutes approximately 1-2% of the labour force of the European Union and the United States but is increasingly prevalent in low- and middle-income countries⁴². Both statisticians and policymakers have dedicated growing attention in the past years to learning about this phenomenon. Overall, four major strategies exist for collecting data on DPE:

- Traditional representative surveys of a larger population, within which those engaged in platform employment can be identified,
- Targeted surveys delivered online, potentially through the digital platforms themselves,
- Administrative data collected by governments or platforms,
- Alternative data sources such as bank checking accounts and web scraping.

Each of these strategies have their own strengths and weaknesses (summarized in Table 99). Countries that wish to understand and monitor the phenomenon of digital platform employment in their workforce should combine insights from traditional and targeted surveys, administrative data and alternative sources that may be at their disposal.

Representative surveys such as Labour Force Surveys aim at estimating the size of workers engaged in NSFE and in employment mediated by digital platforms (online and location-based) but may not be suited for the detailed inquiry about the nature and conditions of those types of work. On the contrary, the targeted surveys are not geared towards estimates but understanding the working conditions of the digital platform workers.

Table 9 Overview of data collection strategies

Data source	Good for	Challenges
Large statistical surveys (labour force surveys, household surveys, ICT usage surveys)	<ul style="list-style-type: none"> • Estimating the incidence of digital platform employment • Identifying key characteristics of digital platform workers 	<ul style="list-style-type: none"> • Cross-country comparability (due to lack of international definitions) • Low statistical power (due to low number of DPE observations) • Not suitable for detailed inquiry about the nature and conditions of DPE • Cognitive challenges (respondents may not fully understand the concept of DPE)
Targeted surveys	<ul style="list-style-type: none"> • Generating in-depth knowledge on characteristics and working conditions of digital platform workers 	<ul style="list-style-type: none"> • Not representative of the total workforce nor the digital platform workforce • Selection bias

⁴² According to key informant interviews and the US Bureau of Labour Statistics (2018).

Administrative data	<ul style="list-style-type: none"> • Estimating the incidence of DPE • Data triangulation with survey data • Observing market shares and tax/social security compliance of platforms 	<ul style="list-style-type: none"> • Difficult to access • Platform workers cannot always be identified
Alternative data (big data, web scraping etc.)	<ul style="list-style-type: none"> • Estimating the incidence of DPE • Observing transactions related to the digital economy • Filling data gaps on specific issues 	<ul style="list-style-type: none"> • Challenges and limitations depend on the data source.

Source: Authors' elaboration

China's platform workers are growing, with diversified forms of employment and complex labour relations, but there is a lack of robust, representative and comparable data. Without the information including contract types, working hours, income levels, social security status or work in platform employment, it is impossible to make accurate assessments on the labour protection needs and provide targeted policy support. It is recommended to establish an accessible integrated monitoring and policy framework, that includes different forms of work, considering for example that many platform workers combine their work on the platform with more traditional forms of work, or move between platform work and other forms of work.

The National Bureau of Statistics is well placed to collect representative periodic data. In partnership with the Ministry of Human Resources and Social Security, NBS could collect and continuously monitor key data, and provide authoritative data support for policy making on platform employment and labour protection. This approach could be complemented by targeted surveys using a common methodology and design to provide a more detailed, comprehensive and accurate mapping of platform employment.⁴³

The CALSS Survey provides a sound methodological basis for inquiring in finer detail the working and social security conditions of workers in NSFE and platform work based on international good practices. Combined with other data source and methods, it provides key information for a continuous monitoring framework that responds to key questions. Finally, the development of disaggregated data in the data base of social insurance administrations, tagging work in NSFE and DPE would greatly increase the power of the monitoring framework.

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⁴³ Interviewee.

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Annexes

Annex 1: Glossary

Table 10 Glossary of selected concepts

Term	Definition
Crowdwork	A specific type of internet-mediated platform employment in which specific tasks are outsourced from a business or institution to an undefined mass of people through an internet application. This process is referred to as 'crowdsourcing'.
Digital economy	The application of internet-based digital technologies to the production and trade of goods and services.
Gig economy	The term is frequently used to refer to less structured work arrangements mediated through an internet platform. This term can also apply to a broader group of workers who may be engaged on a daily or single short task basis, including day labourers who obtain work by waiting at a particular place where employers pick up people to help with short-term tasks, and freelance workers in entertainment who may be engaged for a single performance or 'gig'.
Internet mediated work, or 'platform employment'	Internet mediated work, or 'platform employment' refers to employment that is organized or mediated through an internet platform when the worker is not an employee of the enterprise that operates the platform.
Microtask platforms	Microtask platforms are a type of web-based labour platform that provide businesses and other clients with access to a large, flexible workforce (a "crowd") for the completion of small, mostly clerical tasks, that can be completed remotely using a computer and Internet connection.
Online platforms	These can be conceived as digital 'locations': online spaces where users can obtain information or interact socially or economically. They are, in a way, the digital version of public squares, social clubs or marketplaces.
Platform economy	As the underlying phenomenon is the use of online platforms, which decreases the transaction costs of labour outsourcing and temporary access to goods and services.
Digital platform employment	Platform employees (or workers) are individuals who use an app (such as Uber) or a website (such as Amazon Turk) to match themselves with customers, in order to provide a service in return for money. They offer a diverse range of services including transport, coding and writing product descriptions.

Source: Tinonin (forthcoming)

Annex 2: Key informant interviews

Table 11 List of key informant interviews

Name	Position	Organization
Janine Berg	Senior Economist	ILO
Michael Thye Frosch	Head of Department of Labour Statistics	ILO
Riccardo Gatto	Labour Statistician	Eurostat
Uma Rani	Senior Economist	ILO

Annex 3: Tables on survey tools to measure DPE

Table 12 Overview of measurement approaches in national representative surveys

Country	Year	Income-based approach	Job-based approach	Number of questions	Definition of IPW in question	Examples of platforms given
National Labour Force Surveys or Household Income/Budget Surveys						
Canada	2016	X		2	-	+
China						
Denmark	2017	X		3	-	+
France	2017		X	1	-	-
Finland	2017	X		2	-	+
Italy	2019		X	3	-	+
Russia	2019		X	3	-	-
Singapore	2018		X	Entire module added	-	-
Switzerland	2019	X		4	-	+
United States	2017		X	4	+	+
Other representative surveys						
Germany: DIW Socio-Economic Panel Survey	2020		X	Entire module added	+	-
United States: Rand-Princeton American Life Panel Survey	2018		X	2	-	+

Source: based on Tinonin (forthcoming)

Table 13 Variables to identify non-standard forms employment, working conditions and social security coverage in selected standard LFS and household survey questionnaires

Survey	Available years	Target group	Region
European Union Structure of Earnings Survey (SES)	2002, 2006, 2010, 2014 (4-yearly microdata)	All types of employees and self-employees in both private and public sectors. Excluding wholly remunerated by way of fees or commission, are not on the payroll, or are self-employed; persons whose remuneration wholly takes the form of a share in profits, family workers, own-account workers and unpaid voluntary workers.	EU Member States, Candidate Countries and EFTA countries (Iceland, Norway and Switzerland)

Objective:

To provide accurate and harmonised data on earnings in EU Member States and Candidate Countries, for policy-making and research purposes. The SES is a large enterprise sample survey providing detailed and comparable information on the relationships between the level of remuneration and individual characteristics of employees (sex, age, occupation, length of service, highest educational level attained, etc.) and those of their employer (economic activity, size and location of the enterprise).

Relevant questions included (M: Mandatory; O: Optional):

1. Length of service in enterprise (in years) (M)
2. Full-time or part-time employee (M)
3. % share of a full-timer's normal hours (to 2 decimal places) (M)
4. Type of employment contract (M)
5. Identification key of the local unit the employee belongs to (M)
6. Compulsory social contributions and taxes paid by the employer on behalf of the employee (O)
7. Compulsory social security contributions (O)

Survey	Time	Target group	Regions
European Union Statistics on Income and Living Conditions (EU-SILC)	2004-2018, cross-sectional; 2005-2018, longitudinal.	All private households, and all persons aged 16 and over within the household. Persons living in collective households and in institutions are generally excluded from the target population.	EU countries, Iceland, Norway, Switzerland; some other countries participated on the voluntary basis.
		Four data files per year: household register, household data, personal register, personal data.	

Objective:

The European Union Statistics on Income and Living Conditions (EU-SILC) aims at collecting timely and comparable cross-sectional and longitudinal multidimensional microdata on income, poverty, social exclusion and living conditions.

Relevant questions included:

1. Actively looking for a job
2. Available for work
3. Self-defined current economic status
4. Status in employment
5. Occupation (ISCO-88/ISCO-08)
6. Number of hours worked per week in main job
7. Number of months spent at full-time work as employee
8. Number of months spent at part-time work as employee
9. Number of months spent at full-time work as self-employed (including family worker)
10. Number of months spent at part-time work as self-employed (including family worker)
11. Type of contract
12. Employee income or near cash income
13. Cash benefits or losses from self-employment
14. Pension from individual private plans
15. Flag-pension from individual private plans
16. Old age benefits
17. Survivor benefits

Survey	Time	Target group	Region
European Labour Force Survey (LFS)	Quarterly& annually, 1983-2018	Persons aged 15 years and over, living in private households. People carrying out obligatory military or community service, persons in institutions/collective households are excluded in the target group.	EU member states, the UK, EFTA countries, Montenegro, North Macedonia, Serbia, Turkey.

Relevant questions included:

- Labour status

1. Labour status during the reference week
2. Professional status
3. Continuing receipt of the wage or salary
4. Occupation
5. Supervisory responsibilities
6. Number of persons working at the local unit
7. Time (Year/month) which person started working for this employer or as self-employed
8. Full-time/Part-time distinction
9. Reasons for the part-time work
10. Permanency of the job
11. Reasons for having a temporary job/work contract of limited duration
12. Contract with a temporary employment agency
13. Atypical work/ Shift work/ Evening work/ Night work/ Saturday work/ Sunday work
14. Number of hours per week usually worked
15. Paid/Unpaid overtime in the reference week in the main job

-Second job

16. Existence of more than one job or business
17. Professional status
18. Number of hours worked during the reference week in the second job

Other than the above regular questions asked in the survey, each year there is also an ad hoc module designed to collect information on the latest and emerging labour market issues. The information is thus cross-sectional. The relevant year and information could be⁴⁴:

1. Work organisation and working time arrangements (2019)⁴⁵

Relevant questions:

- 1.1 Variable working time (Who can decide working time)
- 1.2 Freedom to take hours off (1-4 levels, from very easy to very difficult)
- 1.3 Freedom in taking leave
- 1.4 Expected flexibility in working times
- 1.5 Available for work in free time
- 1.6 Recording of presence or working hours (automatically/ manually by whom)
- 1.7 Working under time pressure
- 1.8 Job autonomy (influence on order and content)
- 1.9 Main place of work (office, non-fixed, etc.)

⁴⁴ [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU labour force survey %E2%80%93 main features and legal basis#Main features of the EU-LFS](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_labour_force_survey_%E2%80%93_main_features_and_legal_basis#Main_features_of_the_EU-LFS)

⁴⁵ https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2017.340.01.0035.01.ENG

2. Self-employment (2017)⁴⁶

Relevant questions:

- 2.1 Organisational dependency (Influence over deciding working hours)
- 2.2 Main reason for becoming self-employed
- 2.3 Main difficulty as self-employed
- 2.4 Working with business partners (Working with a co-owner and/or in a network of other self-employed)
- 2.5 Preferred professional status for the main job

Survey	Time	Target group	Region
School-to-Work Transition Survey (SWTS-ILO) ⁴⁷	2012 to 2015	Youth aged between 15 to 29 years.	Armenia, Bangladesh, Benin, Brazil, Cambodia, Dominican Republic, Egypt, El Salvador, Former Yugoslav Republic of Macedonia, Jamaica, Jordan, Kyrgyzstan, Lebanon, Liberia, Madagascar, Malawi, Moldova, Montenegro, Nepal, Peru, Republic of the Congo, Russian Federation, Serbia, Sierra Leone, Tanzania, Togo, Uganda, Ukraine, Viet Nam, West Bank and Gaza Strip, Zambia.

Objective:

To collect labour market information on young people and background characteristics of those young people, and to identify features of labour market demand in developing countries.

Relevant questions included:

1. Employment contract (temporary, no or oral contract, etc.)
2. Hours usually worked per week
3. Preferred trade-off between more income and more hours or less income and fewer hours
4. Working less than normal hours per week (to test time-related underemployment or inadequate employment related to too few hours)
5. Status in employment
6. Benefit entitlements (wage/salary, access to pensions, healthcare)
7. Likelihood of employment at same place in one year (Perception of job insecurity)

Source: Authors' compilation



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⁴⁶ https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=uriserv:OJ.L_.2016.003.01.0035.01.ENG

⁴⁷ https://www.ilo.org/employment/areas/youth-employment/work-for-youth/WCMS_191853