

OVERVIEW OF ATTEMPTS TO MEASURE THE GIG ECONOMY WITH CONSIDERING THE ROLE OF DATA IN MAKING MANAGERIAL DECISIONS

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Abstract: Gig economy, in the 21st century, defined as an economy model based on digital platforms, is a concept that has been present in the economy for at least a dozen years. Nevertheless, there are still many difficulties in measuring the actual size of this market. Finding a proper method of measuring the gig economy market that has as few weaknesses as possible is a must-have for analyses of the freelance economy and use of this data for the managing team or company. The main purpose of this study is to present various ways of measuring the scale of the gig economy market and to specify – based on the literature, reports, and author's own research – the advantages and weaknesses of described methods, taking into account the possible causes. A review of available methods and their comparison allows to conclude that there is currently no concept of gig economy measurement that makes it possible fully reliable assessment of the scale of this part of the market. Currently used concepts (e.g., surveys and tax data analysis) allow for an approximate assessment of the scale of the market but are not without limitations.

Keywords: gig economy, freelancing economy, measurement of gig economy.

JEL Classification: D11, D23, M13, M31.

1 Introduction

Changes taking place in the global economy in the 21st century are also having a strong impact on the modern labor market. These changes are reflected in the growing interest in alternative forms of work to the traditional full-time job, which include, for example, gig economy. Despite the fact that gig economy has been used in business practice for many years, a particularly dynamic growth of this model of cooperation has become possible thanks to development of modern technologies (Zakrzewska, 2022, pp.233-249).

Gig economy is a part of the market where on-demand work model prevails (Roy and Shrivastava, 2020, pp.14; Lobel, 2017, pp.1-15). Within the gig economy, it is assumed that service providers connect with customers through digital platforms, although this is not a prerequisite, and ad hoc cooperation can also be initiated without the mediation of platforms. Within this model:

- independent contractors (gigers) sign contracts to provide services; such contracts usually are short term (Koutsimpogiorgos, et al., 2020, pp.525-545);

- contracting entities (which can be both businesses and individuals) agree to compensate the freelancer not for the time spent on the activities performed, but for the actual result of their work;
- cooperation is irregular and incidental (Stewart and Stanford, 2017, pp.402-437), boiling down to short-term cooperation and sometimes even a one-time activity; and
- communication between the parties to the contract increasingly takes place through a digital platform, although this is not a sine qua non condition (Kalleberg and Dunn, 2016, pp.10-13; Minter, 2017, pp. 438-454; Gandini, 2019, pp.1039-1040).

Growing interest in the gig economy in recent years is evidenced by, among others, analysis conducted by Batmunkh, Fekete-Farkas and Zoltan. As part of this study, a systematic review of the literature regarding gig economy was performed (the research method of bibliometric analysis was used). Online databases were searched using Google Scholar, Scopus, and Web of Science (documents created from 2014 to 2022 were examined). The articles were searched using the keyword "gig economy" in titles, abstracts, etc. This keyword yielded 732 results in Scopus, 827 results in Web of Science, and 738 results in Google Scholar, for a

total of 2,297 documents found. The result decreased to 686 documents after applying the exclusion criteria. The following were excluded: duplicates, unscientific papers, duplicate articles, books, book reviews, conference papers, and letters to the editor (Batmunkh, Fekete-Farkas and Zoltan, 2022, pp.1-15).

The main hypothesis prepared by the author is as follows: There is currently no universal method of measuring gig economy that allows for full describing scale of market. This is due to, among others, market diversity and differences in the way of classifying gigers. Moreover, the author hypothesizes that currently used methods of measuring gig economy – even if these analyses are not unreasonable – provide only a general overview of the state of the market due to limitations. Validity of this thesis will be confirmed by comparing selected measurement methods that are currently used.

The weaknesses of various measurement methods (including the subjective attitudes of respondents or the use of various online platforms by one freelancer) make it difficult to assess the scale of gig economy, and managers are aware of this, regardless of age, level of professional experience, or the size of the companies they represent. Managers interested in working with gig workers are aware of the difficulties in measuring the gig economy market, even though managers generally agree on the features that characterize freelancing. The author intends to confirm this through his own research.

Despite these limitations, the author believes that the results of gig economy measurements can still help managers make decisions, such as establishing cooperation with freelancers or negotiating salaries.

Aim of this study is to describe and compare various ways of measuring the gig economy market. Comparing various measurement methods and presenting their advantages and weaknesses will be supplemented by discussing the factors that make it difficult to measure gig economy and indicates in which areas data – despite their imperfections – can be used by managers.

The considerations undertaken in this paper will make it possible to find answers to the following questions:

How is the gig economy market developing on a global scale?

- What are the ways of measuring the gig economy?
- What are the advantages and disadvantages of different ways of measuring the gig economy?
- What are the potential benefits for managers using gig economy data?

To find answers to these questions, domestic and foreign literature, as well as reports showing size of the market and level of gig economy activity in various European Union (EU) countries were analyzed. This makes it possible to compare different approaches for measuring this phenomenon and indicate their advantages and limitations. In addition, our own research was conducted to examine the opinions of entrepreneurs and managers as to whether, in their opinion, it is possible to objectively measure the scale of gig economy market and to indicate reasons that enable or hinder the implementation of this task.

2 Gig economy – theoretical aspects: Development of global gig economy market

In the literature, one can find various definitions describing what the gig economy is and what cooperation between parties, that is, procurers, digital platforms, and independent contractors, looks like. In these definitions, attention is paid to various aspects of the issue.

Gig economy is an interdisciplinary concept, reflecting the impact of this model from the managerial, organizational, and technological points of view (Kim, 2019, pp.39-41). Treated as a form of cooperation based on short-term orders, gig economy relies mainly on digital platforms. These digital platforms can be an alternative to the traditional relation between manager and subordinate (Dokko, Mumford and Schanzenbach, 2015, pp.1-8; Manyika, et al., 2016, p.20). Gig economy should not be treated as an entirely new phenomenon, but rather as an evolution of practices already used decades ago, with the inclusion of innovations – digital platforms (Kalleberg and Dunn, 2016, pp. 10-13).

Activities related to the performance of tasks included in the so-called gig economy can be:

- an additional, complementary source of earnings or
- the main or only form of income (Skrzek-Lubasińska, 2019, pp.32-50).

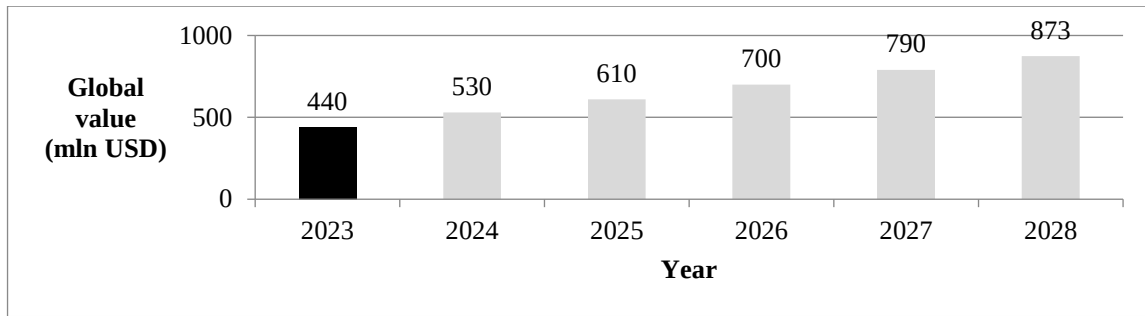


Figure 1. Current and expected value of the global gig economy market in 2023–2028 (in USD billions)
(Source: Own compilation based on Business Research Insights data¹)

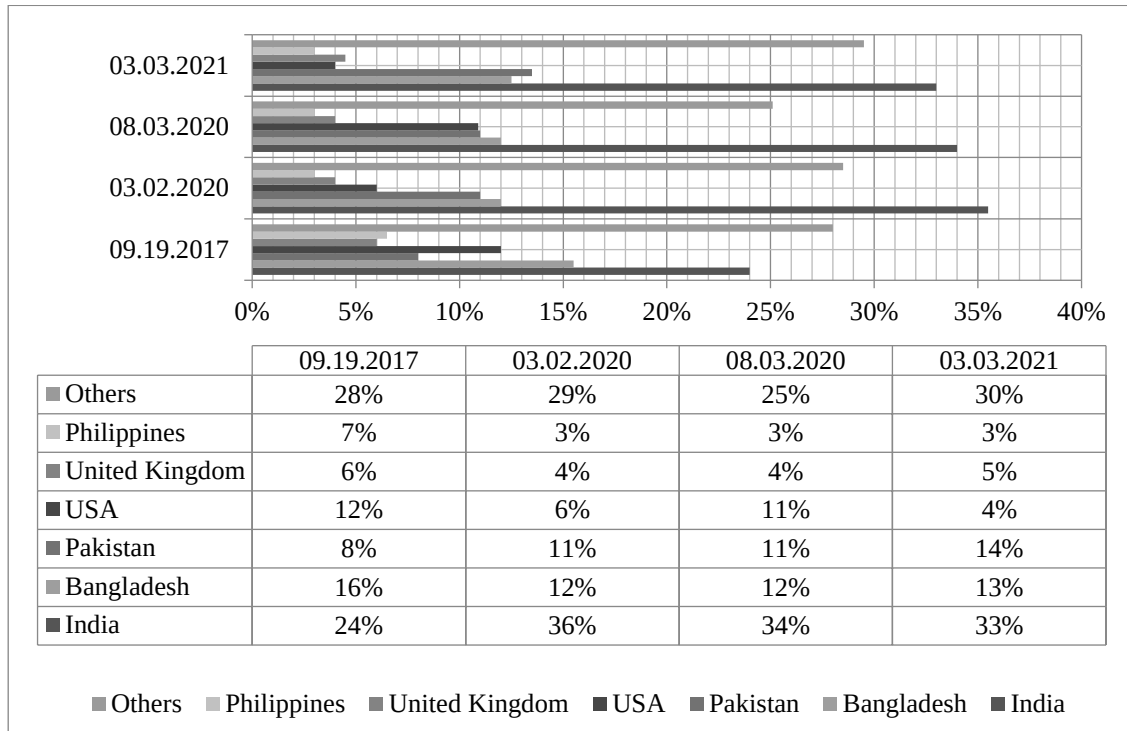


Figure 2. Chosen countries' share of employee participation in the global platform economy (2017–2021)
(Source: Own compilation based on Ostoj, 2020, p.350)

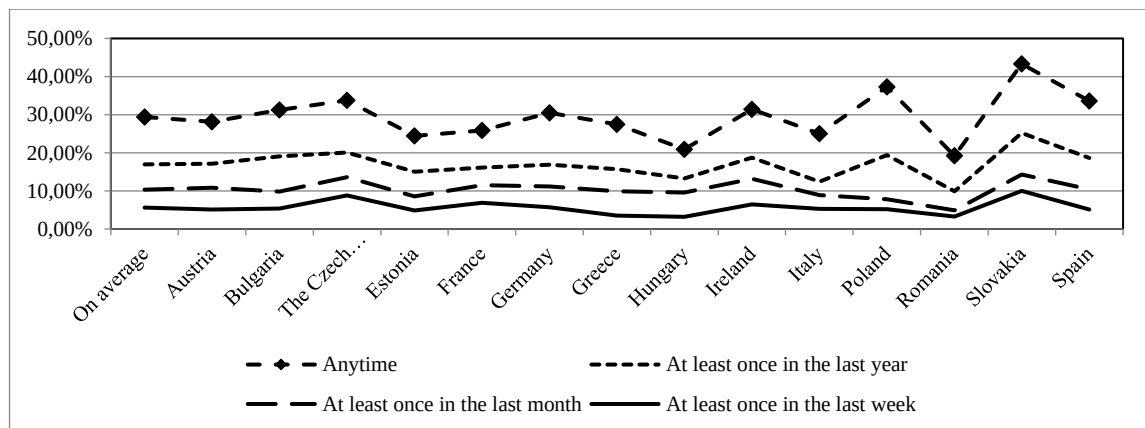


Figure 3. Activity of giggers in chosen European countries (ever, during the last year, month, and week)
(Source: Own compilation based on Piasna, Zwysen and Drahokoupil, 2022, p.16)

¹ Source: <https://www.businessresearchinsights.com/market-reports/gig-economy-market-102503>

Gig economy benefits are probably the reason for optimistic forecasts regarding global value of this market (as shown in Figure 1)

Forecasts regarding the value of gig economy indicate a constant upward trend. In 2025, the global value is expected to be approximately USD 610 billion, and in 2026, USD 700 billion. This trend will continue: USD 790 billion in 2027 and USD 873 billion in 2028.

For this reason, scientists and policymakers should develop programs to balance incomes and foster entrepreneurship for the benefit of society (Batmunkh, Fekete-Farkas and Zoltan, 2022, p.3).

As for countries dominating in global gig economy market, only two belong to the Organization for Economic Cooperation and Development (OECD) – Great Britain and the USA (Figure 2). It is worth noting that population differences between these countries affect the interpretation of the chart, which may make China's lack of participation among the gig economy leaders seem unusual.

In addition, it is important to note that other countries also play a significant role in the global platform economy, such as Ukraine, Indonesia, Sri Lanka, Australia, and Canada. Nevertheless, the share of these countries in the global gig economy market, measured by the number of contractors, does not exceed only a few percent (2%-3%) (Ostoj, 2020, p.350).

Another interesting information about the activity of freelancers can be found in the report prepared by the European Trade Union Institute in 2022 (Figure 3, Table 1).

Generally, low level of variance proves that in respect of

- percentage of people who have performed gig economy work in the past and
- share of gig economy activities earnings in the total income,

there are no significant differences.

Data regarding gig economy market and its participants (contracting companies, digital platforms, and freelancers) may be a valuable information resource, which is crucial when managers make strategic decisions for the company and its employment policy. Data

analysis allows to understand market dynamics, trends, and expectations of freelancers. Gig economy is under analysis from a theoretical and practical point of view (Bakalarz, 2019, p.9-20). Especially, managers should take into account the specific nature of gig economy work because it affects the labor market, competition, organizational culture, and employee motivation. Managers should adapt their strategies to the needs and expectations of gigers (Webster, 2016, p.56-64).

3 Measuring the gig economy

Research in economics is based on data measurement. Correctly performed measurement is the sine qua non of the cognitive process in science. This approach allows the researcher to gain in-depth knowledge of a specific issue.

As for scale of the gig economy market, its potential impact on the labor market and the economic system, as well as further growth of platform economy, analyzing data on freelancers' activity becomes essential (Abraham, et al., 2021, p.259). An approach based on the measurement of numerical data supplemented with qualitative methods should allow us to understand the development of freelance economy and its relationship with the traditional solutions based on full-time employment.

As the freelancing market develops, it becomes increasingly necessary to use analytical tools to assess its various aspects. One of the key tools in this matter is the Online Labor Index (OLI), an index that monitors the global development of the freelancer market. Even though the concept was presented in 2016, it is considered a key point of reference, for example, for economic analysts and scientists studying the impact of freelancing on various aspects of the labor market and the functioning of enterprises (Stephany, et al., 2021, pp.2-3). Using this index also allows researchers to obtain detailed information – the number and structure of people working in the gig economy, taking into account, for example, area and location of activity (continents, countries, and territorial units).

Table 1. Data regarding gig economy in Europe – variance
(Source: Own compilation based on Piasna, Zwysen and Drahokoupil, 2022, p.16)

Country	Antytime (a)	At least once during the last year (b)	At least once during the last month (c)	At least once during the last week (d)	Part of total income €
Austria	28.10%	17.10%	10.80%	5.10%	2.30%
Bulgaria	31.20%	19.10%	9.80%	5.40%	2.90%
The Czech Republic	33.80%	20.10%	13.60%	8.80%	3.60%
Estonia	24.40%	15.00%	8.60%	4.90%	2.30%
France	25.90%	16.10%	11.50%	6.90%	2.60%
Germany	30.50%	16.90%	11.20%	5.70%	2.30%
Greece	27.50%	15.70%	9.90%	3.50%	2.50%
Hungary	20.90%	13.30%	9.60%	3.20%	4.60%
Ireland	31.40%	18.70%	13.20%	6.50%	4.30%
Italy	25.00%	12.40%	8.90%	5.30%	2.40%
Poland	37.30%	19.40%	7.80%	5.20%	4.10%
Romania	19.20%	9.90%	4.90%	3.30%	1.50%
Slovakia	43.30%	25.20%	14.30%	10.00%	3.60%
Spain	33.60%	18.60%	10.40%	5.10%	2.50%
-	-	-	-	-	-
Average	29.44%	16.96%	10.32%	5.64%	2.96%
Variance	0.0041481	0.0014172	0.0006074	0.0003756	0.0000839
Std deviation	0.0644057	0.0376453	0.0246457	0.0193812	0.0091619

Generally, approaches for measuring the scale and structure of gig economy can be divided into several categories. The first is standard survey research, that is, computer, telephone, or personal surveys. However, this method of measurement is time-consuming and exposed to the risk of inaccuracy related to subjective answers provided by respondents.

Another potential way to research the gig economy market is big data analysis, that is, the analysis of large data sets that may come from, for example, the Internet (data made available by digital intermediary platforms and collected with using Web-scraping strategies). Such data may include, for example:

- average working time,
- structure of freelancers by age, gender, amount of income, etc.

Another method is to analyze tax data collected by public administration. Data on taxpayers' income statements can be used to analyze the freelancers' market, although in this case also, the difficulties related to the classification of people working under civil law contracts must be taken into account. It is also important

that tax data do not include income generated in the gray zone (nontaxable activities).

A brief description of selected methods for measuring the scale of gig economy market is presented in Table 2.

3.1 Data regarding gig economy in making managerial decisions

Managers are able to use data about gig economy to, for example, improve recruitment processes and develop a way of cooperation with freelancers. Thanks to this, companies are able to adapt their business strategy to flexible forms of employment, minimize legal and financial risks, and better adapt their resources to changing market conditions.

By analyzing this data, companies can become more flexible and respond faster to new challenges.

One of the digital platforms for gigers is Useme. Useme not only makes it easier for gig workers to find and fulfill orders for freelancers, but also conducts research on the gig economy market in Poland.

Useme prepares reports that present information with characteristics of freelancers, such as their age, gender, education, experience, specialization, rates, motivations, and preferences. These reports may be a valuable source of knowledge both for contractors and gig workers.

Of course, Useme is not the only entity that analyzes the gig economy market; such research is also carried out by companies operating in other market segments, nongovernmental organizations, or governments.

Table 3 shows examples of areas in which information obtained from the above-mentioned sources can be used.

Table 2. Selected methods for measuring the scale of activity in the gig economy
(Source: Own compilation based on: Murtin, 2021)

Research method	Short description	Strengths	Weaknesses
Information and communication technologies (ICT) research (ICT usage surveys)	Computer, personal, or phone surveys	• Good data comparability • Research conducted mainly in countries where the gig economy market is highly developed	• Small size of the research sample • Much of the existing data comes from the USA, which is quite unique in terms of its labor market, characterized by relatively low levels of employment stability and a large number of gig workers. As a result, attempting to apply the results obtained for the USA to the global labor market may lead to incorrect conclusions • Research implementation is limited to a few selected countries • Risk of subjective replies from freelancers
Web scraping	The process of data extraction which involves collecting information from online resources for later analysis. This data can be processed using big data techniques	• Possibility of collecting data in real time • Possibility of comparative analysis of data in time	• The issue of ethics is debatable • Legal data collection via web scraping requires consent from individual users. This means that research conducted using this method may not include freelancers who do not consent to the analysis of their data
Tax data	Analysis of data collected by public administration, which is facilitated by the use of ICT systems	• Generally, the study applies to all participants earning income in a given country (although it does not include people operating in the gray market)	• Focusing solely on numerical data, completely disregarding qualitative data. Such a study does not take into account, for example, issues related to the type of platforms used or technological development • Differences between countries resulting from different tax solutions. This factor may seriously hamper the comparative analysis of data between individual countries
Big data analysis	Analysis of large data sets enables <i>ex post</i> research and <i>ex ante</i> estimation of future phenomena, thanks to usage of forecasting methods and technique known as data science	• Wide possibilities of data analysis and prediction	• Difficulties in obtaining complete data • The data analysis process may be time-consuming • Focus on quantitative data, difficulty in analyzing qualitative information

Table 3. Data regarding gig economy and gigers in making managerial decisions

(Source: Own compilation based on: Freelancing w Polsce 2023, Usume Report; UK HM Government, The experiences of individuals in the gig economy; Ernst&Young, GIG on, Nowy Ład na rynku pracy)

Entity	Where data can be used by management staff?
Usume	HR planning, adaptation to project requirements Analysis of employment costs, adjustment of salary strategies Identification of market areas, analysis of potential clients Assessment of employee competencies Evaluation of marketing effectiveness, analysis of the job market
Ernst&Young	Information useful for shaping the company's legal strategy Identification of areas for technology investment Better understanding of gig workers' expectations Analysis of the employment structure in the company Anticipation of market trends Financial planning, adjustment of compensation strategies Assessment of cost-effectiveness of employing gig workers
UK Government	Evaluation of gigers' skills HR planning, adjustment of recruitment strategy Identification of market areas for expansion Analysis services cost Understanding the expectations of gig workers Assessment of the effectiveness of recruitment platforms Adjustment of compensation and employment condition strategies

4 Measuring the gig economy – limitations

Measuring the scale of gig economy, although extremely important in the context of analyzing this issue, encounters difficulties. Such limitations result largely from the fact that every civil contract or B2B agreement with freelancing/gig economy cannot be treated unconditionally as cooperation with gigers. Characteristics of such cooperation allow the contractor to perform the assigned tasks without the supervision of a superior and without the restrictions typical of an employment contract (Chen, Liu and Wang, 2020, pp.1-14).

Difficulty in analyzing this market area results from the inability to clearly define gig economy as a separate form of cooperation. Statistics kept, for example, by public institutions do not take into account the division into "traditional" economy sectors and those based on digital platforms, and classifying a given activity into the gig economy category creates potential difficulties. Moreover, measuring the scale of activity of those freelancers who obtain orders without the participation of digital platforms appears to be an even more difficult task.

It means that research conducted in individual countries focuses on a limited area of the gig economy, for

example, on a specific sector of the economy (Murtin, 2021).

While assessing an individual situation should not be particularly complex, measurement is more difficult in the case of collective, aggregated data. Various approaches used over the last dozen or so years are presented in Table 4.

Unfortunately, due to the diversity of gig economy, it is extremely difficult to estimate the size of the described phenomenon and precisely determine what part of the gig economy market is occupied by the platform economy (although there are many indications that its share is significant).

Many factors prevent individual proposals from optimally measuring the gig economy; such difficulties may result from

- problems comparing data between different countries,
- the specificity of the platform economy, especially its dynamic nature, and
- difficulties in obtaining complete data that could then be compared, for example, by year (Ostoj, 2020, pp.34-36).

Table 4. Examples of measuring the size of the gig economy
(Source: Own compilation based on: Ostoj, 2020, pp.34-35)

Year	Research subject	Research area	Pros and cons of the chosen method
2009–2010	Activity of freelancers registered on a selected digital platform (Amazon Mechanical Turk)	Amazon Mechanical Turk (digital platform)	Amazon Mechanical Turk (digital platform)
2010	Individual interviews conducted with analysts, journalists, managers, entrepreneurs	Gig economy in IT and internet marketing	Pros: In-depth individual interviews Cons: Exclusion of freelancers themselves, focusing on managers', etc. point of view
2009–2012	Activity of freelancers registered on a selected digital platform (Upwork)	Upwork (digital platform)	Pros: Study conducted in different countries Cons: Limited exclusively to one digital intermediary platform (Upwork)
2013	Expert interviews with representatives of firms offering online outsourcing services	Freelancers working online	Pros: Interviews conducted with experts Cons: Limited emphasis on obtaining opinions from freelancers
2012–2015	Study of large datasets from various online platforms	30 English-language digital platforms	Pros: Large research sample (study included about 1 million service buyers and about a quarter of a million performers) Cons: Lack of in-depth expert interviews
2015	Survey conducted on freelancers as part of Research AND Development (RAND) the Rise and Nature of Alternative Work Arrangements in the USA)	Freelancers	Pros: Coverage of offline work in the study; Cons: Relatively small research group (just under 4000 respondents)
2015	Activity of freelancers registered on a selected digital intermediary platform (Upwork)	Upwork (digital platform)	Pros: Big data analysis Cons: Limited analysis exclusively to one digital intermediary platform (Upwork)
2016–2017	Survey of freelancers from seven European countries	Digital platforms	Pros: Analysis covering gig workers engaged in both online and offline activities from various countries Cons: Focusing only the highly developed countries

Taking into account diversity of gig economy market and the fact that many digital platforms operate on it, analyses based solely on the functioning of a specific sector or one platform may be insufficient. Some of these platforms operate in one country, while others have international or even global reach.

As for existing research on the scale of the gig economy market, another potential limitation may be the method of obtaining data for analysis. The point of some research is to focus on in-depth individual interviews with experts, including managers and analysts. Such interviews allow for obtaining qualitative opinions. However, this type of research does not always take into account the perspective of freelancers themselves.

Another potential weakness of research related to assessing the scale of the gig economy market is the discretion of entities responsible for measurement. For example, in the study "New evidence on platform workers in Europe" (Urzi Brancati, Pesole and Fernández-Macías, 2020, pp.6-10) have been listed:

- occasional platform workers – freelancers who have provided platform labor services less than once a month for the past year;
- marginal platform workers – they provide platform labor services on a regular, monthly basis, but spend less than 10 h a week doing so and earn less than 25% of their income from it;
- secondary platform workers – they provide platform labor services every month, spending between 10 and 19 h a week or deriving between 25% and 50% of their income from it; and
- core platform workers – they provide platform labor services on a regular, monthly basis, working at least 20 h per week on the platforms or deriving at least 50% of their income from them.

Regardless of the validity of such a division, it should still be borne in mind that limits regarding, for example, the number of hours or part of income, are discretionary assumptions; other entities conducting research in the gig economy area may adopt different thresholds, which makes it difficult to compare data. This is an additional limitation for managers, which makes it difficult for them to make decisions on issues related to establishing cooperation with managers.

It is significant that the authors of some analyses report themselves are aware of its potential weaknesses. In their opinion, this report contributes to the ongoing discussion about digital work platforms by presenting statistics on the prevalence of platform work. According to the authors, in some cases, the report provides clear answers, but in others, it indicates the need for further research. For example, COLLEEM overrepresents high-net users, and therefore, generalization of the results to the entire population, including those independent contractors who acquire clients off the Web, should be avoided. Second, it is possible that COLLEEM also overrepresents professional (and therefore more privileged) platform workers. Finally, it is still necessary to bear in mind the limited reliability of the responses, as well as the quality of the online panels used to conduct the survey (Urzi Brancati, Pesole and Fernández-Macías, 2020, pp.6-10).

As you can see, objectively measuring freelancing is a difficult task. Meanwhile, gig workers already constitute a significant part of the labor market, which is important not only from the point of view of market analysis, but also in terms of the government's decision-making regarding the introduction of legal regulations regulating the rights of freelancers, their obligations, etc. To providing freelancers with the same rights as those provided for traditional employees, but also conducting analytical work – it is necessary to clearly determine what criteria must be met to be a freelancer. Based on the literature presented in this article and the answers provided by respondents, the following factors should be taken into account when determining the status of a freelancer (as shown in Table 5).

Of course, the adoption of specific threshold values is a matter of further discussion, for example, in relation to how much time a given contractor spends on digital platforms annually or what percentage of all income (including, e.g., income from an employment contract) in a given tax year is income from activity on digital platforms, work under civil law contracts, etc.

Currently, it is not possible to establish threshold values due to the lack of sufficient data. Another inflammatory problem is the potential need to establish different indicators for different professions (due to the specificity of individual professions).

Table 5. Criteria for freelancer membership: author's proposal
(Source: Own compilation)

Criterion	Description	Potential data sources
Average time of cooperation	Average time of cooperation with all ordering parties in a given time period (e.g., a year)	Data collected by tax offices
Number of ordering parties	The number of ordering parties in a given period of time exceeding a specified value (e.g., more than X ordering parties commissioning work in a year)	Data collected by tax offices
Activity on a digital intermediary platform	Activity on the digital intermediary platform may be considered, for example, in relation to • working time (e.g., activity for at least X months a year), • income level (e.g., income from activity on platforms exceeding X% of all income earned in a given tax year)	• Working time: activity reported by digital intermediary platforms • Income level: data collected by tax offices
Profession type	Qualifying a given contractor to a list of freelance professions created for this purpose	A catalog of freelance professions that would be developed and published in the form of a legal act
Contract type	Civil law contracts, B2B contracts	Data collected by tax offices

A serious difficulty in establishing optimal criterion values is also the specificity of freelance professions, including, for example, the lack of trade unions and industry organizations (while such organizations exist in the case of doctors or lawyers, the situation is different in the case of copywriters, internet marketing specialists, etc.); such strong fragmentation on the part of freelancers makes it difficult to conduct consultations with representatives of individual professions to develop a common position on establishing the criteria for belonging to this professional group. In any case, the effect of recognizing a group meeting the above-mentioned criteria as freelancers could be, for example, to provide independent gig workers with legal protection to counteract such weaknesses resulting from freelancing as, for example, the lack of entitlement to paid vacation leave. As shown in Table 2, data collected by tax offices would be of great importance in granting freelance status. Of course, this does not mean that academic centers or private sector entities would not be important; on the contrary, they could play an advisory role, supporting the analysis of market trends to update the criteria (e.g., to update the catalog of professions).

5 Own research

To gain a deeper understanding of the discussed issue, the author decided to conduct his own research. This study was conducted from April 4 to May 20, 2024. Survey questionnaires (online surveys prepared in MS Forms) were aimed at obtaining the opinions of entrepreneurs and managers from small, medium, and large entities (production and service enterprises). Respondents were asked, among others, to share their feelings about whether they think it is possible to clearly identify who is a freelancer, and if not, what is the reason for it. The survey included closed, single-choice questions as well as questions with a Likert scale. The study covered enterprises based in the Płock poviát, which were selected randomly based on the online database of enterprises on the websites <https://www.biznes.gov.pl/pl/znajrka-firm/>, <https://searcharkaregon.stat.gov.pl/>, using the search criteria (voivodeship – Masovian Voivodeship, poviát – Płock); 230 companies were selected from the generated register and survey questionnaires were sent to them. Responses were provided by 155 respondents, as 75 recipients refused to participate in the survey or did not respond at all (thus, the percentage of completed surveys in relation to all questionnaires sent was 67.4%).

Below is a list of questions that were included in the questionnaire:

1. *How old are you?*
2. *How big is the company you represent?*
3. *Please indicate your level of professional experience as a manager (in years?)*
4. *What is your education?*
5. *Has your company cooperated with freelancers in the last 5 years?*
6. *What is your opinion on this form of professional activity?*
7. *In your opinion, what is the minimum time that cooperation with a freelancer should last (please provide an answer in months)?*
8. *In your opinion, what is the maximum time that cooperation with a freelancer should last (please provide an answer in months)?*
9. *In your opinion, is it possible to make an objective, reliable, and complete assessment of the scale of the gig economy market in a given country?*
10. *Please assess to what extent individual factors influence whether the other party to the cooperation can be described as a freelancer (1 – strongly disagree, 5 – strongly agree)?*
11. *Is it possible to clearly define who is a freelancer (please assess on a scale of 1–5 how much you agree with the statements below)?*
12. *Which entities should be involved in measuring the scale of the gig economy market (1 – strongly disagree, 5 – strongly agree)?*
13. *What are, in your opinion, the difficulties in assessing the scale of the gig economy market (1 – strongly disagree, 5 – strongly agree)?*
14. *In what matters can knowledge about the scale of the gig economy market prove useful in making managerial decisions (1 – strongly disagree, 5 – strongly agree)?*

The answers given by the respondents are presented in Table 6.

Almost three-fifths of the respondents answered question 5: "Has your company cooperated with freelancers in the last 5 years?" As for respondents' opinions on cooperation with freelancers so far, opinions are quite positive – the dominant answer is 4 on a 5-point scale (question 6).

The answers to questions 7 and 8 are also noteworthy; these were requests to indicate the minimum and maximum duration (counted in months) of cooperation with freelancers in their opinion. As for the minimum time, vast majority of respondents considered it to be 1 month, and the average answer was only 0.68 (dominant answers are "1" and "0" month). As for the maximum duration of such cooperation, the average was 8.29 months, and the dominant and median were 6 months – so, in their opinion, cooperation with freelancers is quite short term (although the most extreme answer is 60 months).

Analysis of the answers to question no. 9 regarding possibility of making an objective, reliable, and complete assessment of the gig economy market scale shows that the majority of respondents (44.19%) claimed that it is not possible. A much lesser number, 23.26%, believed that such assessments are possible, among others, thanks to state institutions, because these entities have the appropriate data, including tax data. An even smaller group (16.28%) indicated that the measurement is possible only after the introduction of the act defining the gig economy. An equally large group (16.28%) of respondents believe that assessment can be made on the basis of existing data.

The answers to question 10 show that the majority of respondents perceived the factors included in the survey as important for assessing whether a given contractor is a freelancer. The relatively least important factor for assessing a freelancer is membership of trade unions or industry organizations (almost half of respondents considered this factor neutral). In contrast, for example, three-fifths of respondents fully agreed (a score of 5) that the existence of an appropriate legal act is important, one in four considered the short-term nature of cooperation to be very important, and almost one in three considered the performance of work via digital platforms to be a very important feature. None of the factors included in the question were considered to be unimportant at all (a score of 1); a score of "2" (not very important) was indicated by a small number of respondents (relatively the most in relation to the aforementioned trade unions).

Answers to question 11 show respondents' skepticism about whether it is possible to objectively determine who a freelancer is.

Table 6. Criteria for freelancer membership: author's proposal
(Source: Own compilation)

Question	Replies		
1	Mean: 37.30 Standard error: 0.60 Median: 38 Kurtosis: -1.22 Minimum: 25 Maximum: 50 Mode: 32		
2	Micro enterprise (up to nine employees): 12.90% Small enterprise (10–49 employees): 32.26% Medium enterprise (50–249 employees): 41.94% Large enterprise (over 250 employees): 12.90%		
3	Mean: 5.58 Standard error: 0.25 Median: 5 Kurtosis: 1.15 Minimum: 1 Maximum: 15 Mode: 5		
4	Secondary: 3.23% Bachelor's degree: 32.26% Master's degree: 64.52%		
5	Yes: 58.06% No: 41.94%		
6	Mean: 2.35 Median: 2.00 Kurtosis: -1.70 Minimum: 0.00 Maximum: 5.00 Mode: 4.00		
7, 8	Mean: 0.68 Median: 0 Kurtosis: 1.07 Minimum: 0 Maximum: 3 Mode: 0	Mean: 8.29 Median: 6 Kurtosis: 12.59 Minimum: 2.00 Maximum: 60.00 Mode: 6	
9	Yes	Yes – this is possible through state institutions that already have the appropriate data (e.g., tax data)	23.26%
		Yes – but this will only be possible when a law is developed that clearly defines who is a giger	16.28%
		Yes – the scale of the market can be assessed based on existing data from the statistical office and private sector entities that research the labor market	16.28%
	No	It is not possible because it is impossible to clearly define who is a freelancer	44.19%

Question	Replies					
10	-	Response rate (in %)				
	Reply	1	2	3	4	5
	a. Short-term nature of cooperation	0	0	25.81	48.39	25.81
	b. The existence of a legal act regulating the work of this professional group	0	3.23	19.35	61.29	16.13
	c. Performing work via digital platforms (e.g., Uber)	0	0	29.03	41.94	29.03
	d. The existence of trade unions/industry organizations that bring together gig workers	0	16.13	45.16	29.03	9.68
	e. Flexibility in terms of working hours	0	0	25.81	38.71	35.48
	f. Regularity of income earned	0	3.23	25.81	35.48	35.48
	g. Being subject to state health and social insurance obligations	0	9.68	38.71	29.03	22.58
h. Type of contract concluded	0	9.68	38.71	32.26	19.35	
11	a. Yes – this is determined by the temporary nature of the cooperation	22.58	35.48	16.13	25.81	0
	b. Yes – it depends on the freelancer himself	19.35	38.71	19.35	22.58	0
	c. Yes – a freelancer is anyone employed under a civil law contract	22.58	35.48	16.13	25.81	0
	d. Yes – anyone registered on the digital intermediary platform is a freelancer	22.58	32.26	19.35	22.58	0
	e. No, because it is so fluid that it is difficult to define when you are a freelancer	6.45	16.13	6.45	45.16	25.81
	f. No, because there are no appropriate legal regulations that govern who is a freelancer	6.45	16.13	6.45	45.16	25.81
12	a. Public authorities (e.g., statistical offices or tax authorities)	0	3.23	9.68	45.16	41.94
	b. Private sector entities	0	3.23	6.45	54.84	35.48
	c. Academic centers	0	3.23	6.45	54.84	35.48
13	a. It is not really clear who is a freelancer	0	3.23	6.45	58.06	32.26
	b. Not every civil law contract means that its party is a freelancer	0	0	9.68	54.84	35.48
	c. Freelancers can also work in the gray zone	0	3.23	22.58	41.94	32.26
	d. Information on this topic is not needed	3.23	3.23	38.71	32.26	22.58
	e. Freelancers may not want to share information about their professional activity	0	9.68	16.13	41.94	32.26
14	a. Negotiating gig workers' salaries	0	0	6.45	58.06	35.48
	b. Choosing the type of agreement governing cooperation or the use of intermediary digital platforms	0	9.68	19.35	51.61	19.35
	c. Negotiating working hours	0	0	12.90	61.29	25.81
	d. Planning cooperation with giger, for example, regarding its duration	0	0	16.13	58.06	25.81
	e. Assessing whether you can find freelancers with specific qualifications	3.23	19.35	29.03	41.94	6.45

Relatively few respondents agreed with the position that it can be done – for example, 22.58% of respondents noted that decisive criterion for being a freelancer is the temporary nature of cooperation, activity on a digital platform, or employment based on a civil law contract.

None of the respondents strongly agreed with the fact (rating 5) that it is possible to unequivocally determine whether someone is a freelancer. In contrast, almost half of the respondents agreed with the fact (rating 4) that it is not possible to unequivocally recognize someone as a freelancer, because it is a fluid category and there are no appropriate legal regulations; a quarter expressed strong approval (rating 5).

Answers to question 12 indicate that there is a consensus on which entities (public bodies, private companies, academic centers) are able to measure the gig economy market. The vast majority of respondents expressed their approval of the fact that each of these entities can perform the measurement (approx. half of the respondents indicated a rating of "4," while over a third gave a rating of "5"). Only a small percentage of respondents were skeptical about the possibility of measurement – for example, the rating of "2" was indicated by only 3.23% of respondents (in relation to all three groups included in the question).

The vast majority of respondents identified with the potential difficulties indicated in question no. 13,

which make it difficult to measure the gig economy market. For example, four fifths agreed that it is difficult to clearly indicate who is a freelancer (58.06% – rating 4, 32.26% – rating 5). A similar distribution of answers was found in the case of whether a civil law contract determines who is a freelancer (54.84% – rating 4, 35.48% – rating 5). As for the remaining potential difficulties included in the question, significantly more than half of the responses indicated approval or strong approval of the respondents (only in the case of the answer "Information on this subject is not needed," 38.71% took a neutral position; however, still slightly over 54% agreed with this statement).

Respondents generally agreed on how information on the gig economy market can be useful from the point of view of managers and entrepreneurs – it can be observed that the vast majority of respondents appreciated the importance of this information. For example, as many as 58.06% of the respondents agreed (score 4) that this knowledge can be useful in terms of negotiating gig workers' salaries (while 35.48% of the respondents expressed very strong approval) and as many as 61.29% of the respondents considered that it can help in determining the working hours of gig workers (in addition, 25.81% expressed very strong approval). Relatively few respondents believed that knowledge on this subject could be useful in assessing the possibility of finding candidates with specific competences; however, 41.94% of respondents still expressed approval, and 6.45% expressed very strong approval with this statement.

Table 7. Correlation and R² coefficients between replies
(Source: Own research)

Question	1	2	3	4	5	6	7	8	9
1	1.00	-	-	-	-	-	-		
2	0.14	1.00	-	-	-	-	-	-	-
3	0.06	0.69	1.00	-	-	-	-	-	-
4	0.13	0.44	0.29	1.00	-	-	-	-	-
5	0.03	-0.01	-0.08	0.00	1.00		-	-	-
6	0.02	-0.03	0.01	0.06	-0.92	1.00		-	-
7	0.08	0.01	-0.01	0.18	0.16	-0.15	1.00	-	-
8	-0.03	0.23	-0.01	0.16	-0.28	0.35	-0.02	1.00	-
9	0.05	-0.04	-0.06	-0.04	-0.27	0.25	0.13	0.40	1.00
R² coefficients									
1	-	-	-	-	-	0.00	0.01	0.00	0.00
2	-	-	-	-	-	0.00	0.00	0.05	0.00
3	-	-	-	-	-	0.00	0.00	0.00	0.00
4	-	-	-	-	-	0.00	0.03	0.02	0.00
5	-	-	-	-	-	0.00	0.03	0.02	0.00

In Tables 7-12, the correlation between general data of the research sample (age, size of the enterprise represented by respondents, etc. – questions 1-5) and respondents' feelings regarding the effectiveness of

measuring the gig economy market and the possibility of using this data is presented.

Table 8. Correlation and R^2 coefficients between replies
(Source: Own research)

Question	1	2	3	4	5	10a	10b	10c	10d	10e	10f	10g	10h
1	1.00	-	-	-	-	-	-	-	-	-	-	-	-
2	0.14	1.00	-	-	-	-	-	-	-	-	-	-	-
3	0.06	0.69	1.00	-	-	-	-	-	-	-	-	-	-
4	0.13	0.44	0.29	1.00	-	-	-	-	-	-	-	-	-
5	0.03	-0.01	-0.08	0.00	1.00	-	-	-	-	-	-	-	-
10a	0.02	0.15	0.09	0.08	0.27	1.00	-	-	-	-	-	-	-
10b	-0.02	0.25	0.32	0.24	-0.07	0.46	1.00	-	-	-	-	-	-
10c	-0.03	-0.10	0.04	0.00	0.17	0.77	0.43	-	-	-	-	-	-
10d	-0.05	-0.15	-0.37	0.20	-0.09	0.10	0.11	0.10	1.00	-	-	-	-
10e	-0.18	-0.08	0.15	0.01	0.06	0.46	0.44	0.71	0.05	1.00	-	-	-
10f	-0.05	0.06	0.21	0.16	0.27	0.68	0.39	0.64	0.16	0.57	1.00	-	-
10g	0.09	0.04	0.03	0.17	0.04	0.48	0.30	0.63	0.30	0.40	0.50	1.00	-
10h	0.05	0.02	0.06	-0.11	0.29	0.35	0.30	0.33	0.16	0.05	0.35	0.49	1.00
R^2 coefficients													
1	-	-	-	-	-	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.00
2	-	-	-	-	-	0.02	0.06	0.01	0.02	0.01	0.00	0.00	0.00
3	-	-	-	-	-	0.01	0.10	0.00	0.13	0.02	0.05	0.00	0.00
4	-	-	-	-	-	0.01	0.06	0.00	0.04	0.00	0.03	0.03	0.01
5	-	-	-	-	-	0.07	0.00	0.03	0.01	0.00	0.07	0.00	0.08

Table 9. Correlation and R^2 coefficients between replies
(Source: Own research)

Question	1	2	3	4	5	11a	11b	11c	11d	11e	11f
1	1.00	-	-	-	-	-	-	-	-	-	-
2	0.14	1.00	-	-	-	-	-	-	-	-	-
3	0.06	0.69	1.00	-	-	-	-	-	-	-	-
4	0.13	0.44	0.29	1.00	-	-	-	-	-	-	-
5	0.03	-0.01	-0.08	0.00	1.00	-	-	-	-	-	-
11a	-0.05	-0.22	-0.36	-0.35	0.01	1.00	-	-	-	-	-
11b	-0.02	-0.24	-0.29	-0.31	-0.05	0.95	1.00	-	-	-	-
11c	-0.02	-0.22	-0.34	-0.30	-0.05	0.95	0.95	1.00	-	-	-
11d	-0.09	-0.12	-0.01	-0.24	0.19	0.70	0.63	0.73	1.00	-	-
11e	0.01	0.08	0.15	0.15	0.28	-0.77	-0.84	-0.82	-0.53	1.00	-
11f	0.01	0.08	0.15	0.15	0.28	-0.77	-0.84	-0.82	-0.53	1.00	1.00
R^2 coefficients											
1	-	-	-	-	-	0.00	0.00	0.00	0.01	0.00	0.00
2	-	-	-	-	-	0.05	0.06	0.05	0.01	0.01	0.01
3	-	-	-	-	-	0.13	0.09	0.11	0.00	0.02	0.02
4	-	-	-	-	-	0.12	0.10	0.09	0.06	0.02	0.02
5	-	-	-	-	-	0.00	0.00	0.00	0.03	0.08	0.08

Table 10. Correlation and R^2 coefficients between replies
(Source: Own research)

Question	1	2	3	4	5	12a	12b	12c
1	1.00	-	-	-	-	-	-	-
2	0.14	1.00	-	-	-	-	-	-
3	0.06	0.69	-	-	-	-	-	-
4	0.13	0.44	0.29	1.00	-	-	-	-
5	0.03	-0.01	-0.08	0.00	1.00	-	-	-
12a	0.01	-0.31	-0.08	-0.22	0.14	1.00	-	-
12b	0.06	0.01	0.12	-0.19	0.10	0.55	1.00	-
12c	0.12	0.01	-0.10	-0.19	0.03	0.60	0.36	1.00
R^2 coefficients								
1	-	-	-	-	-	0.00	0.00	0.01
2	-	-	-	-	-	0.10	0.00	0.00
3	-	-	-	-	-	0.01	0.01	0.01
4	-	-	-	-	-	0.05	0.04	0.04
5	-	-	-	-	-	0.02	0.01	0.00

Table 11. Correlation and R^2 coefficients between replies
(Source: Own research)

Question	1	2	3	4	5	13a	13b	13c	13d	13e
1	1.00	-	-	-	-	-	-	-	-	-
2	0.14	1.00	-	-	-	-	-	-	-	-
3	0.06	0.69	1.00	-	-	-	-	-	-	-
4	0.13	0.44	0.29	1.00	-	-	-	-	-	-
5	0.03	-0.01	-0.08	0.00	1.00	-	-	-	-	-
13a	0.13	0.20	0.13	0.20	0.33	1.00	-	-	-	-
13b	0.07	0.21	0.07	0.10	0.28	0.79	1.00	-	-	-
13c	0.15	0.07	-0.21	0.17	-0.03	0.56	0.62	1.00	-	-
13d	-0.06	-0.25	-0.21	0.01	0.01	0.38	0.36	0.46	1.00	-
13e	0.02	-0.02	-0.08	0.23	0.10	0.51	0.57	0.55	0.46	1.00
R^2 coefficients										
1	-	-	-	-	-	0.02	0.00	0.02	0.00	0.00
2	-	-	-	-	-	0.04	0.05	0.00	0.06	0.00
3	-	-	-	-	-	0.02	0.01	0.05	0.04	0.01
4	-	-	-	-	-	0.04	0.01	0.03	0.00	0.05
5	-	-	-	-	-	0.11	0.08	0.00	0.00	0.01

As can be seen, the correlation coefficient for answers to individual questions generally had low values. Although correlation between some questions is 0.60 and higher, in principle, however, correlation between the age of respondents, their professional experience, etc. and feelings about measuring the gig economy market is not significant. In the author's opinion, this means

that the analyzed problem is universal and applies to market participants regardless of their age, whether they belonged to different generations on the labor market, their level of professional experience in a managerial position, etc. Due to such low obtained Pearson correlation and R^2 coefficients, the author decided not to conduct linear regression analysis.

Table 12. Correlation and R^2 coefficients between replies
(Source: Own research)

Question	1	2	3	4	5	14a	14b	14c	14d	14e
1	1.00	-	-	-	-	-	-	-	-	-
2	0.14	1.00	-	-	-	-	-	-	-	-
3	0.06	0.69	1.00	-	-	-	-	-	-	-
4	0.13	0.44	0.29	1.00	-	-	-	-	-	-
5	0.03	-0.01	-0.08	0.00	1.00	-	-	-	-	-
14a	-0.01	0.26	0.27	0.35	0.25	1.00	-	-	-	-
14b	0.05	0.10	0.46	0.11	-0.04	0.37	1.00	-	-	-
14c	0.02	0.47	0.48	0.25	0.14	0.53	0.29	1.00	-	-
14d	0.02	0.42	0.47	0.29	-0.03	0.71	0.44	0.71	1.00	-
14e	-0.07	-0.34	-0.04	0.09	0.15	0.14	0.42	-0.18	0.06	1.00
R^2 coefficients										
1	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00
2	-	-	-	-	-	0.07	0.01	0.22	0.18	0.12
3	-	-	-	-	-	0.07	0.21	0.23	0.22	0.00
4	-	-	-	-	-	0.12	0.01	0.06	0.08	0.01
5	-	-	-	-	-	0.06	0.00	0.02	0.00	0.02

6 Discussion and conclusions

As a model of cooperation, gig economy is an effect of managerial, economic, social, and technological transformations taking place in the 21st century. Despite some differences in definitions, researchers agree on several key aspects, such as:

- irregular employment,
- gigers' independence, and
- freelancers involvement in one-time projects of an incidental nature (Ostoj, 2013, pp.239-252).

In general, entrepreneurs, researchers, and employees are optimistic about the gig economy concept, but measuring this trend is still a difficult task. Although the growth of gig economy is expected to continue, lack of consistent definition standards, flexibility (Oyer, 2020, p.2; Kuek, 2015, p.4) and variability of working conditions complicate data collection, making it difficult to accurately estimate the scale of the gig economy. The lack of information about informal transactions and difficulties in including gig economy areas exacerbate these problems. Technological changes observed over recent years and the growing role of online platforms make traditional methods of measuring employment obsolete. Still, understanding these challenges is a key to effectively adapting social

policies and regulations to ensure fair working conditions in the era of the gig economy.

The specificity of this type of work means that managers have to change their approach and instead of long-term cooperation, opt for the services of freelancers. This poses new challenges for both the workers and the employers, such as how to ensure the quality, timeliness, and security of the work, how to manage the communication and feedback, and how to deal with the legal and ethical issues involved.

Based on the considerations discussed in this paper, the following conclusions can be drawn:

- Gig economy (freelance economy) is a cooperation model based on short-term orders, in which the functioning of digital intermediary platforms plays an important role.
- The dynamic development of the gig economy market is confirmed by forecasts according to which the global value will reach approximately USD 610 billion in 2025 and then increase to USD 873 billion in 2028.
- Measuring the scale and structure of gig economy is challenging due to the lack of a uniform data collection methodology and difficulties in identifying active users on digital platforms. For example, there is a risk associated with the so-called "ghost accounts," that is, a situation in which one user has

accounts on more than one digital platform and, in addition, conducts gainful activity outside the platforms.

- There are many initiatives to assess the scale of the gig economy, but they suffer from serious weaknesses. Some studies ignore, for example, the contractors or freelancers themselves, and others are based on analyses of only one platform.
- The lack of precise methods for measuring the gig economy makes it difficult not only to assess the scale of development of this market sector, but also to make managerial decisions. As a result, it may be difficult to assess this sector on the labor market and employment conditions.
- Too general or outdated data about the gig economy market makes it difficult for management staff to, for example, assess the competences of freelancers. This, in turn, may affect the efficiency and profitability of projects for which freelancers' services are used.

In turn, based on our own research, we can draw the following conclusions:

- Respondents unanimously point to the temporary nature of freelance cooperation. The maximum duration of such cooperation was given as 6 months (the average was only 8.29 months), while in the answers to the question about the minimum duration of cooperation with freelancers, 0 or 1 month was indicated (the average was 0.68 month).
- According to almost half of the respondents, it is not possible to make a full, reliable assessment of the scale of the gig economy market. Only one in six claims that it is possible to do this based on existing data.
- It is unanimously recognized that many factors influence whether a given contractor can be considered a freelancer, including, for example, ad hoc nature of cooperation or activity on digital platforms.
- Despite skepticism about the possibility of making a reliable gig economy market measurement, respondents agree that this task should be carried out by all groups of entities included in the survey questionnaire (private enterprises, public bodies, academic centers). Moreover, most respondents found

the data on this subject useful when making managerial decisions, for example, in relation to negotiating the terms of cooperation with freelancers.

These considerations confirm the validity of the hypothesis presented in the introduction.

Inaccurate data makes it difficult to negotiate adequate remuneration for freelancers, which may affect their motivation and commitment to work. This may reduce the quality and timeliness of services, as well as increase the risk of losing employee loyalty and trust.

In the opinion of the author of this paper, measurements of the gig economy often do not take into account one of the key features of this employment model, which is low entry barriers (Gherardi and Murgia, 2013, pp.75-103). As for platforms, there are no special requirements on candidates. Instead of formal requirements, such as education or professional qualifications, the key are skills that are verified during the freelancer's cooperation with subsequent clients, who have the right to assess the quality of the work of individual freelancers. Low entry barriers can significantly contribute to the increase in interest in this model and the dynamics of development of entities from this market segment. It seems that the potential in this case is greater compared to the traditional employment model, and scalability is a feature that allows creators of digital platforms to quickly adapt to current market conditions, including changes in the labor market. Scalability is one of the most important features of the gig economy. Because digital platforms are easy to scale, they can quickly adapt (increase or reduce) to changing labor market conditions. It means they can quickly respond to changes in demand and supply, which is crucial for maintaining competitiveness in the market (Broughton, et al., 2018, p.8). The scalability of the gig economy is an opportunity for managers because they can quickly increase their team if necessary.

These considerations can be further developed to better understand the discussed issue, that is, the role of the gig economy in making managerial decisions, taking into account what needs to be done to reliably measure this market segment. The effect of further considerations may be the creation of a research proposal that will allow for a reliable measurement of the gig economy market, while eliminating the weaknesses characteristic of already used concepts.

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