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Crowdworking in France and Germany

Executive Summary

Crowd work refers to the practice of assigning tasks and projects undertaken for payment to online contributors via digital platforms. We use data from a recent survey among companies in Germany and France to explore the economic relevance and potential barriers of this phenomenon from the demand side. In particular, companies from the information economy and the manufacturing industry have been surveyed in Germany and companies from the manufacturing, construction, and services and trade industries were surveyed in France.

Specifically, we provide evidence on the share of companies using crowd work and investigate what incentivises or hinders companies' decisions to hire online contributors on digital platforms. Despite some differences between both countries, we identify the following trends for Germany and France:

- Crowd work is a widely known concept among the national industries analysed and especially among service providers and the information economy.
- However, the number of clients of the platforms among the sampled industries is rather limited.
- Crowd work appears to be more appealing to smaller companies.
- Potential areas for using crowd work often include administrative tasks, technical/IT support and creative work activities. Most companies use crowd work for tasks that require more advanced skills, compared to activities such as data work.
- Finally, the companies' belief that their work tasks are not suited to crowd work is the main barrier to a potential use of digital labour platforms. Other relevant concerns are the risk of a leak of internal knowledge, uncertainty over the legal framework, and difficulties in controlling the quality of the work performed by online contributors. In addition, a sizeable share of companies does not want to support such a form of work.

In this study, we elaborate on these results and provide an interpretation of common figures and main differences in light of the sample differences in the two countries. Our results on the use of crowd work in Germany and France contribute to the emerging literature studying the so-called gig economy from the employer's perspective. Finally, our results may provide interesting insights for platform managers and policymakers.

Acknowledgements

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1. Introduction

Technological developments have been expanding the outsourcing possibilities available to firms. Digital platforms facilitate alternative work arrangements and allow the interaction of employers with a generally global pool of independent workers. These new work arrangements are often discussed under the term "gig economy". The gig economy is usually understood to include mainly two forms of digital platforms allowing for "crowd work" or "location-driven services". Instead of location-driven services platforms, such as Uber or Deliveroo, we focus on crowd work arranged on digital platforms where the work content is delivered directly via a platform website or a phone application. Via those online platforms, tasks and projects traditionally performed in-house can be assigned to external workers, who carry out these tasks for payment. Examples of such crowd work platforms include Amazon Mechanical Turk, Fiverr, or Upwork.

Using responses to a targeted survey among German and French companies, this study provides evidence on the share of companies using crowd work and investigate what incentivises or hinders companies' decisions to hire online contributors on digital platforms. Despite some differences across industries and countries, we identify relevant common trends.

The remainder of this study is structured as follows. After introducing the subject and defining our contribution to the existing literature (section 2), we describe our methodology (section 3). We report the results of our descriptive analysis in section 4. We conclude in section 5 by summarising and interpreting the main findings.

2. Context and Literature

Growing literature on the worker perspective

Digital labour platforms range from start-ups to multinational enterprises (Corporaal and Lehdonvirta, 2017). While many of them are open to a worldwide crowd of contributors, others restrict subscriptions to a defined geographic area. For instance, the micro-working platform FouleFactory limits usage only to contributors located in France. Moreover, crowd work platforms range from qualified freelancing platforms (e.g. Upwork) to microwork platforms (e.g. Amazon Mechanical Turk, Microworkers.com) that provide piece-work and involve "fragmented data tasks that myriad providers execute on online platforms" (Tubaro et al. 2020). A number of platforms, like Fiverr, are in-between. Likewise, skills range from very basic on most micro-working platforms to high, wherever freelancers need to have specific experiences and competences in a certain domain or activity, for which they are often paid on an hourly or milestone basis.

The literature on crowd work and "platformised" labour has primarily focused on digital workers and their working conditions. Multi-homing, little visibility and the geographic dispersion of the workers are crucial obstacles for researchers interested in identifying and mapping platform workers. Studies such as Tubaro et al. (2020) and Kässi et al. (2021) designed a methodology to overcome these barriers. Another growing stream of the literature has been focusing not only on the demographics of online workers but also on their motivation and behaviour on the platform (e.g. Ipeirotis, 2010; Brabham, 2010; Seifried et al., 2020). Moreover, some authors study the potential of online labour markets for the socio-economic progress of developing countries (Kuek et al., 2015) or as a particularly beneficial option for unemployed individuals (Laitenberger et al., 2021; Huang et al., 2020).

Scarce evidence about client behaviour

Knowledge of crowd-workers and intermediaries business models has been growing significantly. We still know relatively little about the crowd-working phenomenon from the client's side though. Below, we summarise the main contributions to the literature exploring platform work from the client's perspective:

According to Corporaal and Lehdonvirta (2017), start-ups and small and medium enterprises were early adopters of online freelancing platforms, but recently platform work has started being incorporated in the business model of an increasing share of large and multinational enterprises. In particular, their study examines the adoption of what they call "platform sourcing" by Fortune 500 enterprises. By conducting nine case studies, the authors identify three distinct motivations to hire online freelancers: 1) access to a scalable source of labour, skills and expertise, 2) a reduction of start-up and transaction costs, and 3) a reduction of hiring barriers. They also identify major challenges faced by large firms that decide to adopt this outsourcing channel and, finally, they provide some guidelines for companies hiring and working with online freelancers.

Stanton and Thomas (2019) find that experience of the platform is another key determinant of online labour demand. Exploiting exogenous variation in workers' wage bids on a popular online freelancing platform, the authors find that companies value for hiring in the market increases as a form of learning-by-doing.

Thuan et al. (2016) study the phenomenon from a managerial perspective. Drawing from a comprehensive literature review, they build a conceptual framework of factors underlying the decision to outsource on online labour platforms. Employers take into account companies' work content characteristics, such as divisibility in tasks, feasibility online, required level of confidentiality of the information to be shared with the worker. Crucial risks considered in a decisional framework deal with the quality of work results and the potential loss of intellectual property. Other elements considered are the budget, the availability of workers on the platforms, and suitable infrastructures. Differently, Burke and Cowling (2015) investigate the perception of firms' executives of a set of heterogeneous firms in the UK, with regard to freelancing benefits to the business. The study sheds light on the relatively high value attributed to online contributors, in particular in dynamic and innovative business environments.

Stephany et al. (2020) study the impact of the COVID-19 pandemic on online labour demand. Drawing on data from the Online Labour Index, the authors find that after a rapid decline of outsourcing requests by platform clients in early March 2020 the demand for platform workers was subject to an equally rapid recovery in the following months. This paper is particularly relevant for our study in light of the fact that our surveys took place after the outbreak of the COVID-19 pandemic.

The present study aims at contributing to this recent literature, moving the geographic focus to Europe. Based on a targeted survey in Germany and France, we describe which firms and sectors make use of digital labour platforms and elicit their goals and purposes as well as barriers that prevent companies from using crowd work. The design of our questionnaire is inspired, among others, by the results of the above-described literature. Finally, the most similar empirical works to this study, in terms of scope and methodology, is the paper by Van Belle et al. (2020) on the attitudes of Belgian companies towards outsourcing microwork to Africa and the study by Erdsiek et al. (2018) on the crowd work phenomenon in Germany in 2018.

3. Methodology

We designed a targeted questionnaire in order to collect information on the attitude of companies towards crowd work in Germany and France. We provide respondents with the following definition of crowd work: "Crowd work describes the assignment of tasks and projects via online platforms. These assignments are carried out by external workers against payment". In addition, we asked firms in Germany and France the same set of four questions:

- Does your company use crowd work?
- What are the possible uses of crowd work in your company?
- What would be your main goal with a possible use of crowd work?
- What are the barriers to the use of crowd work in your company?

In Germany, the questionnaire was added to the quarterly ZEW Business Survey in the Information Economy conducted in September 2020. All respondents who answered the online version of the questionnaire were asked the additional questions focusing on crowd work. In total, the analysis is based on survey responses from 786 managers, such as the firm's CEO, CIO, or head of HR, and provides representative results for the German information economy and manufacturing industry. In the German survey, the sectors ICT services, media services, knowledge-intensive providers of professional, scientific & technical services, and ICT hardware manufacturers are subsumed under the term "information economy". See Table A1 in the Appendix for more details.

In France, we integrated the questionnaire in the "72nd Half-yearly SMEs Business Climate Survey" of the French Bank of Public Investment (BPI). Our questions were included in the online survey or a link to them was incorporated in the paper version of the BPI's questionnaire. The sample of respondents consists of 3,323 companies among the following industries: manufacturing, construction, services and trade. See Table A2 in the Appendix for more details.

While the survey questions on our subject were identical, the study differs in the countries regarding some aspects. Responses in Germany were collected during September 2020, while in France collection took place one quarter later. Samples between countries differ as the German survey targets companies in the information economy and companies in manufacturing, while the French sample of respondents is broader. To ensure a representative sample and simplify comparability, we grouped French companies into three main industries: manufacturing, construction, services and trade.[1] Also, both samples included slightly different firm size classes, which were adapted to ease comparability.[2] Finally, there were some differences in the programming of the online version of the questionnaire.[3]

[1] This last cluster also includes companies in the tourism and transport sectors.
[2] The French survey restricts the target to only small and medium enterprises (SMEs) and includes in the sample also firms with a number of employees below 5 units that are not included in the German sample, which on the contrary does not restrict only to SMEs.
[3] In Germany, companies could proceed to the next question without indicating any response to a given question. In contrast, the French survey forced respondents to give at least one answer to each question.

4. Results

Crowd work awareness and usage

Analysing the familiarity of respondents with the crowd work concept, we find that 75% of companies in the German information economy and 67% of companies in the German manufacturing industry indicated that they were aware of the term crowd work (Figure 1). In France, around half of the companies in the surveyed industries already had some knowledge about crowd work. Similarly to Germany, the concept of crowd work is more often familiar to services firms than to manufacturing firms in France. Moreover, large firms with at least 100 employees are in general most likely to know the term crowd work in both countries (Table 1).

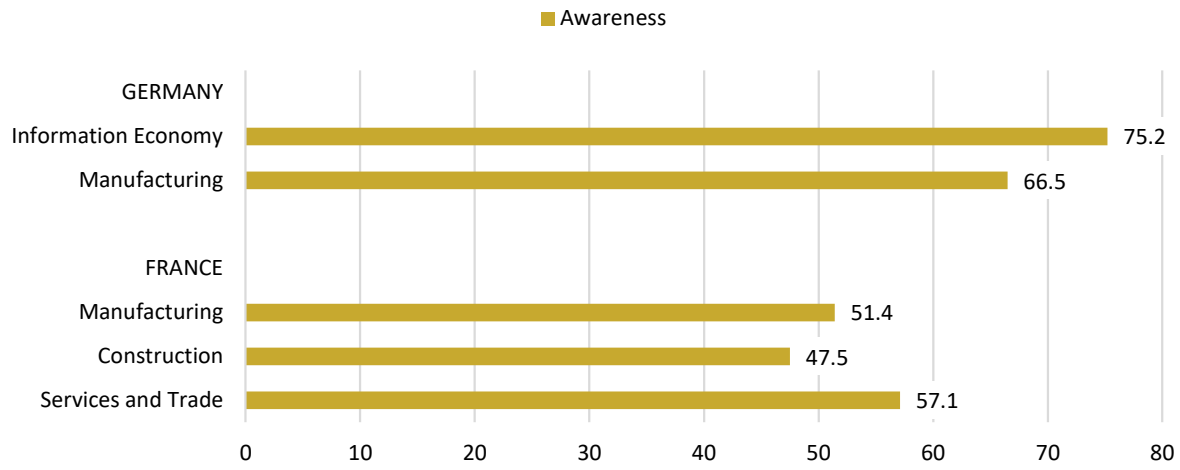
Although many companies know about this outsourcing channel, the number of those using digital platforms to assign tasks and projects is rather limited. Within the industries targeted in this analysis, the share of French companies using crowd work varies from almost 16% in services and trade to 12% among companies in manufacturing (Figure 2). In contrast with the findings on awareness, the share of German companies using crowd work is considerably lower in the information economy (8%) and the manufacturing industry (6%). With the exception of the French manufacturing industry, small firms with less than 20 employees are most likely to use crowd work (Table 2).

Among crowd work users, the percentage of companies satisfied by this outsourcing channel to the point of planning to enhance its potential in the future is small and reaches a peak of 3.3% of companies in the services and trade industry in France. In the German information economy, the share of companies currently not using crowd work but planning to hire online contributors by the end of 2021 amounts to 1.2%. In the French industries, this share amounts to around 2%. Comparing the shares of new users and existing/intensifying users allows to approximate the growth rate of the adoption. For instance, the share of users in the French Service sector is expected to grow by 16 percent (2.5 / (12.3+3.3)).

In the case of Germany, the current share of users can be compared to the results of previous surveys from the years 2016 and 2018 (Ohnemus et al., 2016; Erdsiek et al., 2019). As shown in Figure 3, the use of crowd work platforms has risen continuously in recent years. Compared to the current results, a smaller share of companies have used or planned to use crowd work in the past. In the information economy, this share was 4.3% in 2016 and 4.5% in 2018. In the manufacturing sector, the share of companies with a (planned) use of crowd work had so far increased from 2.0% in 2016 to 3.1% in 2018. Thus, there has been a considerable boost within the period from 2018 to 2020. A part of this increase might result from adjustments in the organisation of work due to Covid-19.

As the difference in the share of firms that are aware of crowd work and the share of firms using crowd work indicates, the majority of firms seems to be hesitant about using digital labour platforms. The share of companies that do not plan to adopt crowd work – while being aware of this concept – is around 10 times larger than the share of users in the German industries and around three times larger in the French industries.

Figure 1: Awareness of the crowd work concept (percentage of companies per industry)



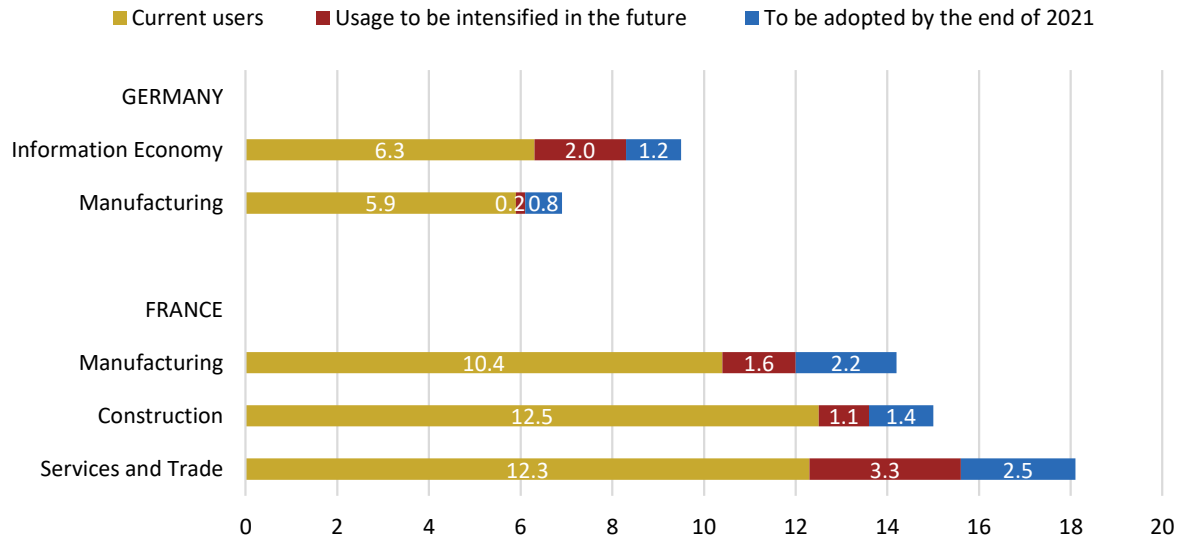
Reading guide: 75.2% of companies in the German information economy indicated that they knew the concept of crowd work.

Table 1: Awareness of the crowd work concept (percentage of companies per industry and size)

		Up to 19 Employees*	20–99 Employees	>= 100 Employees
GERMANY	Information Economy	74.5	77.7	74.9
	Manufacturing	60.8	73.8	70.9
FRANCE	Manufacturing	51.5	50	61.7
	Construction	47.0	48.4	53.9
	Services and Trade	56.9	58.6	63.5

Reading guide: 74.5% of companies in the German information economy with 5 to 20 employees are aware of the crowd work concept. *Note: *Excludes firms with 1–4 employees for Germany.*

Figure 2: Users and future adopters of crowd work (percentage of companies per industry)



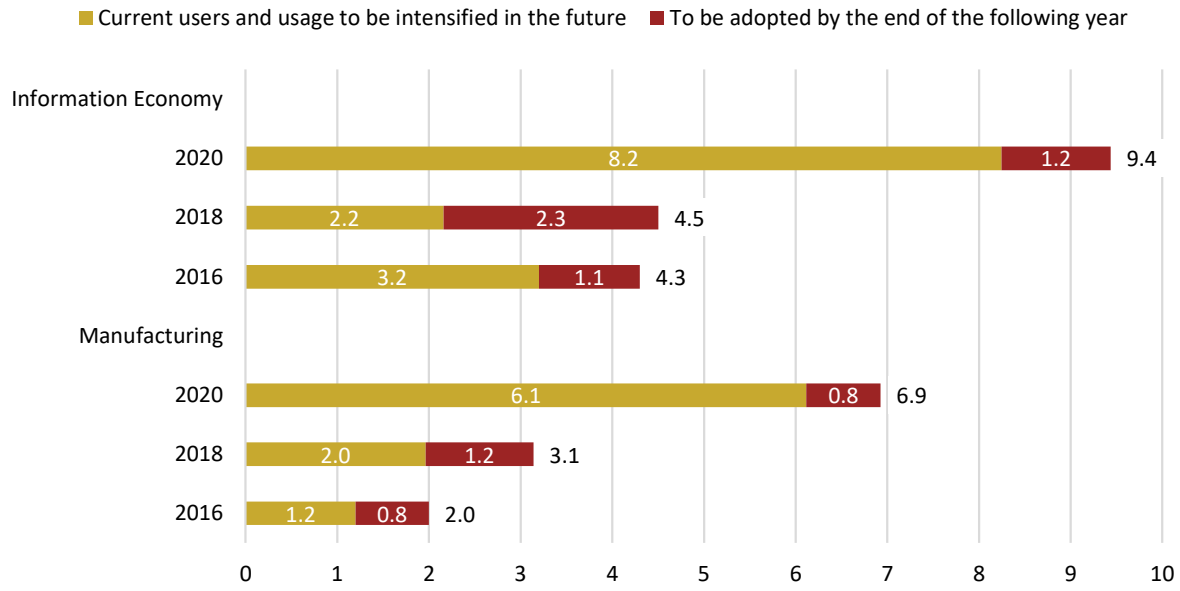
Reading guide: 8.3% of companies in the German information economy use crowd work. Out of these companies a share of 2 percentage points will intensify the usage in the future and 6.3 percentage points will not intensify the use of crowd work.

Table 2: Users of crowd work (percentage of companies per industry and size)

		Up to 19 Employees*	20–99 Employees	>= 100 Employees
GERMANY	Information Economy	9.4	5.6	3.8
	Manufacturing	7.0	6.8	1.9
FRANCE	Manufacturing	12.2	8.0	16.6
	Construction	14.5	10.2	7.7
	Services and Trade	15.8	13.5	9.5

Reading guide: 9.4% of German companies in the information economy with less than 20 employees use crowd work. In France, the share of companies in the manufacturing industry and with more than 100 employees with knowledge of this phenomenon is 16.6%. *Note: *Excludes firms with 1–4 employees for Germany.*

Figure 3: Users and future adopters of crowd work (percentage of companies)



Reading guide: 8.2% of companies in the German information economy used crowd work in 2020. In 2018, this share amounted to 2.2%.

Uses and Potential Uses of Crowd work

To elicit companies' potential incentives to use crowd work, we asked the companies the following question: "What are the possible uses of crowd work in your company?" The question was deliberately formulated in such a way that it allows users as well as non-users of crowd work to answer. As shown in Table 3, around 35% of companies in Germany and France use or would potentially use digital labour platforms to recruit specialists for technical and informatics needs (e.g. programming, data analysis and internet-related activities).[4] Despite this common figure, France and Germany differ in the ranking of potential uses as measured by the share of firms indicating each potential use. While among French companies, the outsourcing of administrative tasks (e.g. accounting, customer service, project management) is considered a potential use of crowd work by around 45–60% of companies, this share amounts to roughly 19% of companies in Germany. Except for the construction sector in France, about one third of companies in all other industries in Germany and France see a potential use of crowd work for creative work (e.g. graphic design, marketing, copywriting).

[4] Due to differences in the programming of the online questionnaires in Germany and France, relative frequencies are provided that do not adjust for missing values in order to increase comparability of the survey results.

Administrative tasks, technical support and creative work activities are usually outsourced through freelancing platforms (e.g. Upwork, Freelancer.com) where freelancers offer specialised skills to potential employers. In contrast, the outsourcing of data-related tasks such as data entry, labelling and categorisation often occurs on micro-work platforms (e.g. Amazon Mechanical Turk, FouleFactory). As our survey results indicate for both countries, companies are least likely to indicate the possibility of outsourcing supporting data work (e.g. training data for machine learning, categorisation, tagging) to crowd workers. The highest share of potential use of crowd work for data work is observed for companies in the German information economy (15%). Moreover, we observe in all the industries a positive correlation between company size and use or potential use of crowd work platforms for data work. This correlation may be interpreted in light of a higher internal (human and computational) capacity of large companies to leverage this type of work. Smaller companies might be less likely to outsource activities such data annotation of micro-work platforms, but make use of a full service from an AI provider (e.g. a chatbot).

Table 3: Uses and potential uses of crowd work (percentage of companies per industry)

		Administrative Tasks	Data Work	Tech/ Informatics Support	Creative Work
GERMANY	Information Economy	18.3	15.3	36.1	31.4
	Manufacturing	19.1	12.3	33.1	36.5
FRANCE	Manufacturing	49.1	7.3	36.9	29.7
	Construction	60.2	4.2	33.2	18.6
	Services and Trade	45.5	7.5	37.7	32.1

Reading guide: 18.3% of German companies in the information economy use or would consider using crowd work as a potential channel to hire staff for administrative tasks, 15.3% for data work, 36.1% for technical/informatics support and 31.4% for creative tasks.

Goals to achieve with crowd work

In addition to the type of tasks that could be outsourced to crowd workers, we also elicit the potential benefits for companies. Around 50% of companies in the German industries and 40% of companies in the French industries consider the access to specialised skills to be a potential goal of using crowd work (Table 4). The high prevalence of this potential goal is in line with our previous results on the high share of companies indicating a potential use of crowd work for technical support and creative activities.

In Germany, 46% of companies in the information economy and 37% in the manufacturing industry indicate that increasing the flexibility of their staff (e.g. by reducing peak loads or speeding up project processes) would be a goal of the potential use of crowd work. Among the French industries, this share of companies is considerably lower and ranges from 23% to 25%. Finally, a share of 33% (manufacturing industry) to 38% (construction) sees reducing costs as an important determinant of the choice to use crowd work. In Germany, this share amounts to 31% in the information economy and 41% in the manufacturing industry.

Table 4: Goals to achieve with adoption and potential adoption of crowd work (percentage of companies per industry)

		Increase flexibility	Reduce costs	Access specialised skills
GERMANY	Information Economy	45.5	31.1	54.8
	Manufacturing	37.1	40.6	56.4
FRANCE	Manufacturing	22.7	33.1	44.4
	Construction	24.7	38.2	37.2
	Services and Trade	25.4	34.0	43.3

Reading guide: Firms had multiple options for responding. Around 45.5% of companies operating in the German information economy adopt or would adopt crowd work to increase staff flexibility.

Barriers to the use of crowd work

Finally, companies were asked about the factors that might hamper the adoption of crowd work. In particular, companies were asked: "What are the barriers to the use of crowd work in your company?" In general, French companies appear more reluctant about adopting crowd work than German firms. In particular, between 48% and 55% of companies in the French industries indicated that "crowd work is a form of work that we do not want to support" (Table 5). In Germany, this share of companies amounts to roughly 23% to 25% of companies.[5]

Overall, the perceived incompatibility of companies' work content with this type of work is the main barrier to the adoption of crowd work for the sampled industries in France and Germany. In France, 73% to 82% of companies indicated that their work activities are not suited to crowd work. In Germany, this share is somewhat lower and ranges between 61% and 67%.

Many companies consider the risk of a leak of firm-specific internal knowledge to be a barrier to the potential use of crowd work. In both countries, companies in the manufacturing sector are most likely to indicate that a potential knowledge leak hampers the adoption of crowd work (63% in Germany and 54% in France). But also in the other industries, more than 40% of companies see the risk of knowledge leaks due to externalising online tasks and projects traditionally performed internally. Moreover, the fear of potential knowledge leaks grows with company size.[6] Larger firms could indeed be more likely to deal with a large amount of confidential information (e.g. patents, clients' data) or to have more structured and stricter non-disclosure and internal confidentiality regulations.

In both countries, roughly every second company in the surveyed industries indicated that difficulties in terms of monitoring and controlling the quality of the work constitute a barrier to a potential use of crowd work. In particular, roughly 54% in the German industries and between 43% and 49% in the French industries see a lack of quality control as a factor hampering the potential use of crowd work. Finally, between 44% and 52% of companies in both countries indicate that the uncertainty over the legal framework is a barrier to using crowd work.

[5] With few exceptions at the industry level, distrust is particularly more common within large companies. Results are available upon request.
[6] Results are available upon request.

Table 5: Barriers to the use or potential use of crowd work (percentage of companies per industry)

		Work content not suitable	Risk of knowledge leak	Legal uncertainty	Difficulties in quality control	No support for crowd work
GER-MANY	Information Economy	67.2	46.4	50.4	55.4	22.6
	Manufacturing	60.9	62.8	52.1	54	24.7
FRANCE	Manufacturing	80.7	53.6	50.3	47.2	55.4
	Construction	81.9	41.2	49.5	49.2	55.5
	Services and Trade	73.0	43.7	43.8	43.4	48.4

Reading guide: Firms could select multiple options simultaneously. Around 67.2% of German companies in the information economy consider their work content not suitable for crowd work, 46.4% are concerned by the risk of internal knowledge leak, 50.4% by legal uncertainty, 55.4% by difficulties in quality control, while 22.6% claim to be against crowd work per se.

5. Conclusion

Summary of Main Results and Interpretation

Finding 1: Crowd work is a widely known concept

We find that around half of the French companies belonging to the manufacturing, construction or services industries are familiar with the concept of crowd work. Awareness of this phenomenon is even higher among German companies operating in manufacturing and, especially, in the information economy. A potential reason for the higher awareness of companies in Germany might partly stem from the fact that some of the companies had already participated in earlier waves of the ZEW survey focusing on the topic of crowd work in 2016 and 2018. Moreover, the companies subsumed under the term information economy are likely to have a higher level of digitalisation and are, thus, more likely to know about crowd work.

Finding 2: Companies' use of crowd work is quite limited, though higher in France than in Germany

Even though many companies know about crowdworking, the share of companies that use crowd work in 2020 is still limited to around 12–16% in the French industries analysed and 6–8% in the German industries analysed. However, it is unclear to what extent these figures may be interpreted as a signal of distrust specifically towards digital labour platforms or as reflective of a general low usage of outsourcing channels, even offline.

In terms of differences between countries, the following explanations might be valid. First, the survey was delivered to respondents in Germany during the summer of 2020 in an intermediate period of relative recovery from the COVID-19 pandemic. In contrast, the French survey was conducted during the second country-level confinement, which could have led to a greater need for specialised figures to cope with specific necessities driven by the remote-working modality. Second, the German information economy is a relatively digitised industry. Therefore, one could assume higher in-house availability of technical and informatics skills, usually offered by online freelancers, in those German companies which might partly explain their lower demand of crowd work compared to France.

Finding 3: Crowd work is more attractive to micro-companies rather than larger ones

As our survey results indicate, the share of companies using crowd work is higher among small firms than in large firms. Moreover, smaller companies appear to be less worried by the potential risk of knowledge leaks when outsourcing on digital platforms. In line with the learning-by-doing results of Stanton and Thomas (2019), small firms are likely to be early adopters of digital labour platforms (Corporaal and Lehdonvirta, 2017) and may have acquired sufficient experience and familiarity with this hiring tool to increase their willingness to use crowd work to fill vacancies. One potential reason why companies with less than 20 employees are more likely to be clients of online labour platforms may be a reduced access to specialised skills in-house, that have to be outsourced. Compared to other outsourcing channels, crowd work guarantees certain flexibility and simplifies the hiring process, lightening the bureaucratic burden, and therefore may appear particularly attractive to companies with a smaller administrative capacity.

Finding 4: A sizeable share of companies sees potential areas for using crowd work

Both in Germany and France, potential areas for using crowd work often include administrative tasks, technical/IT support and creative work activities. The preferential use of crowd work for tasks that require more advanced skills than activities such as data-work resonates with the findings regarding the main objective of the platforms users: access to qualified workers and skills. However, an additional explanation might be that data work, such as training data for machine learning, categorisation, or tagging, is just not relevant for a sizeable share of companies.

In light of the COVID-19 pandemic, the need for technical/IT support on digital platforms might have also increased since the beginning of 2020 because of a strong shift in working from home.[7] Working from home indeed creates a greater need for technical support in order to guarantee the continuity of work activities in remote mode, maybe especially for companies that are less digitised.

Finding 5: The main barrier for using crowd work is companies' beliefs that their work tasks are not suited to crowd work

Between 61% and 82% of companies in Germany and France indicate that their work content is not suitable for crowd work. In addition, the companies often consider the risk of knowledge leaks and uncertainty over the legal framework to be crucial barriers to the potential use of crowd work. Moreover, potential users are concerned about controlling work quality and possible moral hazard by online contributors. This is more severe in an anonymous setting, such as on the micro-working platforms. Therefore, platform managers may want to consider reinforcing or introducing a monitoring system or a quality verification system. Finally, many firms are reluctant to use crowd work because they do not want to support such a form of work. This share of firms is considerably higher in the French industries (48–56%) than in the German industries (23–25%).

This study aimed to assess the economic relevance of crowd-working in Germany and France. We plan to update these results by continuing this survey regularly, which will allow us to track the evolution of companies' awareness and the use of platform labour over time.

[7] For the German information economy and manufacturing industry, Erdsiek (2021) provides empirical evidence on the shift towards working from home due to the COVID-19 pandemic.

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Appendix

Table A1: Classification of industries, Germany

	NACE Rev. 2 Code	Section
Information economy		
ICT hardware		
Manufacture of electronic components and boards	26.1	C – Manufacturing
Manufacture of computers and peripheral equipment	26.2	C – Manufacturing
Manufacture of communication equipment	26.3	C – Manufacturing
Manufacture of consumer electronics	26.4	C – Manufacturing
Manufacture of magnetic and optical media	26.8	C – Manufacturing
ICT services		
Software publishing	58.2	J – Information and Communication
Telecommunications	61	J – Information and Communication
Computer programming, consultancy and related activities	62	J – Information and Communication
Data processing, hosting & related activities; web portals	63.1	J – Information and Communication
Media services		
Publishing of books, periodicals and other publ. activities	58.1	J – Information and Communication
Motion picture, video and television programme production, sound recording and music publishing activities	59	J – Information and Communication
Programming and broadcasting activities	60	J – Information and Communication
Other information service activities	63.9	J – Information and Communication
Professional, scientific, and technical activities[a]		
Legal and accounting activities	69	M – Prof., Scien., and Tech. Activities
Management consultancy activities	70.2	M – Prof., Scien., and Tech. Activities
Architectural and engineering activities; technical testing and analysis	71	M – Prof., Scien., and Tech. Activities
Scientific research and development	72	M – Prof., Scien., and Tech. Activities
Advertising and market research	73	M – Prof., Scien., and Tech. Activities
Other professional, scientific and technical activities	74	M – Prof., Scien., and Tech. Activities
Manufacturing industry		
Manufacture of chemical products and pharmaceuticals	20, 21	C – Manufacturing
Manufacture of machinery and equipment	28	C – Manufacturing
Manufacture of motor vehicles, trailers and semi-trailers, and of other transport equipment	29, 30	C – Manufacturing
Other manufacturing	10-33[b]	C – Manufacturing

Note: [a] Out of the NACE Rev. 2 Section "M - Professional, scientific and technical activities" the following subsections are not included in our analysis: Activities of head offices 70.1; Veterinary activities 75. [b] Other manufacturing includes the NACE Rev. 2 Section "C – Manufacturing" (Codes 10-33) except for the codes already covered by before mentioned industries.

Table A2: Classification of industries, France

	NACE Rev. 2 Code	Section
Services and Trade		
Services		
Business to business (B2B)		
Business to consumer (B2C)		
Accommodation	55	I – Accommodation and Food Service Activities
Travel agency, tour operator and other reservation service and related activities	79	N – Administrative and Support Service Activities
Trade		
Motor Vehicles Trade and Repair	45	G – Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles
Retail Trade	47	G – Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles
Wholesale trade	46	G – Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles
Transportation	49-51	H – Transportation and Storage
Construction		
Buildings	41	F – Construction
Public work	42	F – Construction
Manufacturing industry		
Food products	10-11	C – Manufacturing
Capital, Consumer and Intermediate goods	12-33	C – Manufacturing