

# **The Digital Market for Local Services: A one-night stand for workers? *An example from the on-demand economy***

**Willem Pieter De Groen, Ilaria Maselli  
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## **Abstract**

This case study provides a snapshot of the dynamics in the digital market for locally provided personal services. Based on a case study for a Belgium platform with 14,113 identified workers and 9,459 posted tasks, the findings suggest that the current intermediation is inefficient. Only a limited share of the tasks posted on the platform are being completed, whereas the characteristics of the not-completed tasks are fairly limited. Moreover, just a small share of the workers participating in the platform is actually performing the completed tasks. Their average earnings per hour are in most cases above the minimum wage and even above the median wage in the offline market. At the present time, however, the limited earnings for individual workers prevent this mode of working from becoming an alternative to a conventional job. In addition to the standard determinants of workers' earnings (e.g. gender, age, occupation, etc.), the characteristics and evaluation mechanism of the platform have a large influence on the distribution of tasks and earnings.

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# The Digital Market for Local Services: A one-night stand for workers?

## *An example from the on-demand economy*

Willem Pieter De Groen, Ilaria Maselli and Brian Fabo\*

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### Introduction

The on-demand economy is growing and potentially becoming important in more and more sectors. It is currently already disruptive in transport (e.g. Uber and BlaBlaCar) and hotel services (e.g. Airbnb). But it goes well beyond its most famous cases: there are many small and medium-scale digital platforms that are trying to get a stake in the intermediation of goods and services. The fundamental change in the middle man may have profound socio-economic consequences, including changes in the labour market, which can lead to quests for revisions in the existing policies. At the present time, however, there is very limited unbiased and quantitative information on the topic, which would be required to make far-seeing policies to promote smart and sustainable innovation and grow.

The digital labour market is not homogenous. Platforms can be divided into at least two distinct groups: i) provider of virtual services that can be performed anywhere in the world and ii) providers of physical services that inevitably need to be performed locally.

Virtual services can be both high- and low-skilled. One can find, for example, via Upwork a helping hand for an academic literature review or launch a contest for interior designers via CoContest and graphic designers via 99Design. But it is possible to outsource low-skilled micro-tasks, such as checking for restaurant reviews via Amazon Mechanical Turk.

Both high- and low-skilled physical services are also available, although the platforms for low- skilled services dominate. The spectrum is vast. A common request consists of seeking help to move, pickup or deliver furniture. But also pet sitters and babysitters can be easily found. The most famous platform for this type of services is the American TaskRabbit.

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Figure 1. A conceptualisation of the digital labour market



Source: Authors' elaboration.

Platform work is a revolution for virtual services, as it creates a true globalisation of work in which a worker can find a job at any point in time in a remote location and a company can hire a contractor to perform a specific task drawing from a huge crowd of workers (Huws, 2015). This freedom, however, does not apply to a physical service that needs to be performed locally. Nonetheless, the digital labour market does have an impact. It is a two-sided market that operates by making information more easily accessible and transparent and by lowering transaction costs (Rochet & Tirole, 2004), which is likely to benefit consumers (Goudin, 2016).

What is less clear, however, is whether it will also benefit workers and society as a whole. Harris & Krueger (2015) argue that it is important that these platforms succeed thanks to their superior technology and efficiency, and not because of regulatory arbitrage. On the one hand, platform work creates opportunities to work more flexibly, providing an incentive for people of working age, but currently not active, to enter the labour market. Moreover, new forms of demand may benefit unemployed workers. On the other hand, working conditions could deteriorate as a result of crowd work, eventually turning all employees into self-employed workers,<sup>1</sup> which could reduce the bargaining power of workers considerably.

This paper marks an attempt to look inside the black box by carefully studying a platform that intermediates local services. Called ListMinut.be, the platform is the Belgian version of TaskRabbit, matching time-poor users with time-rich workers (see Box 2 in section 1 for a comparison between the two platforms). In other words, it can be used to find help, for instance, to maintain the garden, assemble furniture or take care of pets.

The analysis reveals, using a web-crawled database with observations on 14,113 workers and 9,459 posted tasks, that most of the primarily young workers who subscribed to the platform have not performed a single task to date, while the workers who secured jobs in this fashion managed to earn a decent wage per hour, often in line with or higher than the legal minimum. Nevertheless, the number of hours that are currently intermediated on the platform are insufficient to make it a substitute for conventional work. A large majority of workers, in fact, only completed one task via the online platform, essentially rendering it a

<sup>1</sup> According to the data, a long-term trend towards greater precariousness in the workplace does exist. In the EU, the share of contingent workers (self-employed, temporary and involuntary part-time workers) increased from 27.4% in 2002 to 32% in 2014 (Maselli et al., 2016).

marketplace for ‘one-night stands’. In turn, the platform shows that there is potential for growth if certain design issues are accommodated in order to improve the likelihood of a successful match.

The following sections provide an extensive analysis of the characteristics of this platform. The first section presents the data gathered and methodology used for the analysis of both workers and tasks. In section 2, we assess the remuneration of the tasks, the distribution of earnings and the mismatch in supply and demand of services. In the third and final section, conclusions are drawn.

## 1. Data and methodology

The ListMinut.be tries to match demand and supply for locally provided personal services (see Box 1). In order to bring supply and demand together, the people willing to provide services (workers) and the demanders of the services (tasks) need to successfully complete the various steps involved.<sup>2</sup> This case study focuses on the main steps in which information is publicly disclosed, namely: the profile of the worker, which the demander and the platform use to assess whether the worker would be suitable for the task, the description of the task that is requested and the level of remuneration. While this information is made public, information specifying which workers the platform approaches to express an interest in a task is kept confidential. Once a match is made, however, and the task is successfully completed, the name of the worker and the date of completion are disclosed.

The information disclosed in this paper has been obtained through web crawling, i.e. essential information on the workers and the tasks was systematically downloaded from the ListMinut.be website and copied into a database. In total, the database collected information on 14,113 workers and 9,459 tasks posted between 23 December 2013 and 22 December 2015.<sup>3</sup> The total number of observations is consistent with the total number of registered workers reported by the platform, and the cumulative earnings based on the tasks are almost identical to the earnings that the platform provides for the working. It is very likely, therefore, that the database captures all or almost all the completed tasks during the sample period on the platform.

The subset on the workers includes information such as name, age, skills, location, etc.<sup>4</sup> In turn the information on tasks includes the name of the poster, date of the post, time to respond, price, type of the task, number of hours<sup>5</sup> required and location. Moreover, information is provided on the worker, if the task has been completed. See Annexes 2 and 3 for a detailed overview of the indicators used for the analysis.

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<sup>2</sup> See Annex 1 for an extensive description of the ten steps in the matching process.

<sup>3</sup> A total of 1,369 tasks were performed before 23 December 2013, when the website was substantially changed, or that were posted after 22 December 2015, to account for the period that it normally takes to perform a task from posting to sending the evaluation form.

<sup>4</sup> Besides the information that is visible on the public part of the platform, the source-code of the public pages provided for some of the workers’ more personal details (e.g. full name, address, email, telephone number, etc.), which the workers might not want to have disclosed publicly.

<sup>5</sup> In order to obtain the number of hours for all tasks, it was assumed that a week has 38 working hours and a day 7.5. The number of hours spent in pet-sitting is adjusted for purposes of comparison, i.e. it is assumed that pet-sitting takes approximately 0.5 hours a day once it is for a longer period than one day.

The crawled data has been extended with statistics on the gender of the workers. The gender of more than 90% of the observations in the sample could be identified using the first name database of the Belgium Statistics as of 2013. This database provided all the male and female first names as well as the number of men and women who hold this name. Most of the first names are uniquely defined for either male or female and of the names that can be both male and female one gender is mostly dominant. The gender was only attached to the worker at the moment that there was at least 95% certainty about the gender. An additional complication to determine the gender was that the first name of a limited number of workers was not provided, e.g. the worker provided a fictitious name or a few self-employed provided the name of an entity.

In addition some geographical indicators were added. The distance between the location of the task and the worker has also been estimated based on the geographical coordinates of the postal code. For the estimated distance between the geographical coordinates of the postal codes have been retrieved from Google Maps. Moreover, also the province in of the activity has been determined using the information from the Belgium postal services bpost.

#### *Box 1. About Listminut.be*

ListMinut is a platform for matching supply and demand for locally provided services. To a large extent, requests fall into the group of low- and medium-skilled services, such as home repair, gardening, delivery, cleaning, pet-sitting and babysitting. But one can also find a photographer, a Dutch or French teacher and a web designer on ListMinut.

The Belgium digital platform allows both self-employed and non-professionals to request and supply services throughout the entire country in both Dutch and French. The platform was launched in 2012 by four students from the Université catholique de Louvain in Louvain-la-Neuve. According to the description provided on the website (as of January 2015), more than 14,000 individuals are registered. This is in line with the 14,113 accounts of workers that were identified. On the demand side, 10,850 tasks have been identified, of which 2,849 or 26%, were successfully matched and completed.

ListMinut obtains its revenues from a fee charged to the demander of the task once the service is successfully completed and from the sale of insurance to the demander. The fee depends on the total price of the task, varying between 15% for tasks up to €30, 13% for tasks up to €100 and 10% for tasks with a price above €100 and a minimum of €3 per task. In addition, the platform sells insurance products from a large Belgium insurer to demanders to protect themselves against potential complications.

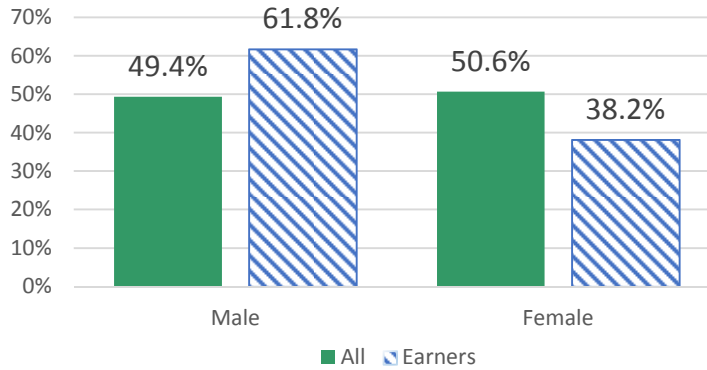
## 1.1 Defining characteristics of the workers

A very large fraction of the workers who are registered on the platform have not completed a single task. In fact, the dataset counts 14,113 workers, of which only 764 or 5.4% have recorded earnings. This is in line with the results of Mihai (2015), who finds for O’Desk that about 85% of the registered users haven’t managed to earn a single dollar. To understand the differences between the workers who performed at least one task (‘earners’) and the other workers, we assess the characteristics of the workers are in this section across both dimensions.

The labour force of ListMinut is well-balanced from the point of view of gender. Of the workers whose gender could be identified, 49.4% are male. As shown in Figure 2, however, when one considers only the subset of earners on the platform, the balance is shifted in

favour of male workers. Some 62% of the earning-workers are male and 38% are female. For comparison, 54% of the Belgium labour force is composed of men.

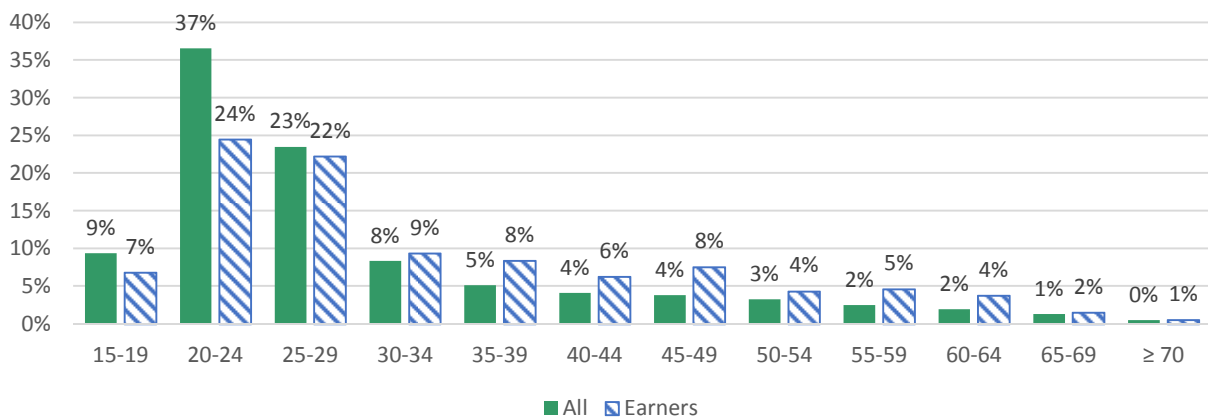
Figure 2. Gender balance of ListMinut labour force



Source: Authors' elaboration.

The majority of workers on the platform are relatively young, which indicates that they might still be following education or in the early stages of their career. Data on the age of the workers, available for 78.5% of the sample, reveal that the age profile of the ListMinut labour force is strongly skewed towards younger cohorts. Figure 3 shows that workers below the age of 30 form 69% of the workers who registered their age. The younger cohorts are less dominant amongst the earners, but the majority of the workers recording earnings are still below 30 years in age. In turn, only 1.4% of the registered workers and 1.7% of the earning workers have reached retirement age.

Figure 3. Distribution across age cohorts of ListMinut labour force



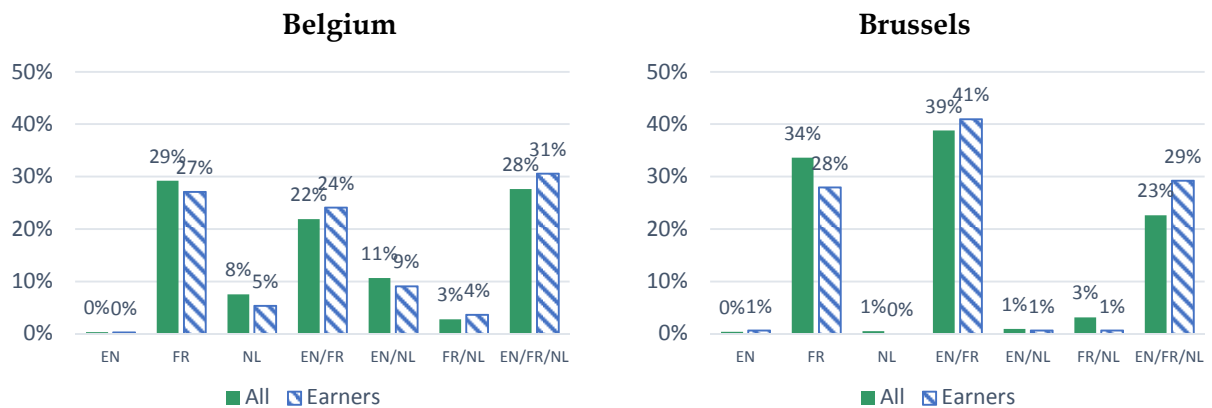
Source: Authors' elaboration.

Another interesting variable from the point of view of the labour market is the number of languages any worker commands. Workers who are able to speak multiple languages might be able to respond to more tasks, in particular in the bi-lingual and internationally-oriented region of Brussels, and the capacity to speak foreign languages might signal a higher level of education. Of the 69% of workers who indicated their language skills, about two-thirds claim to speak more than one language. These workers were more represented among the earners,



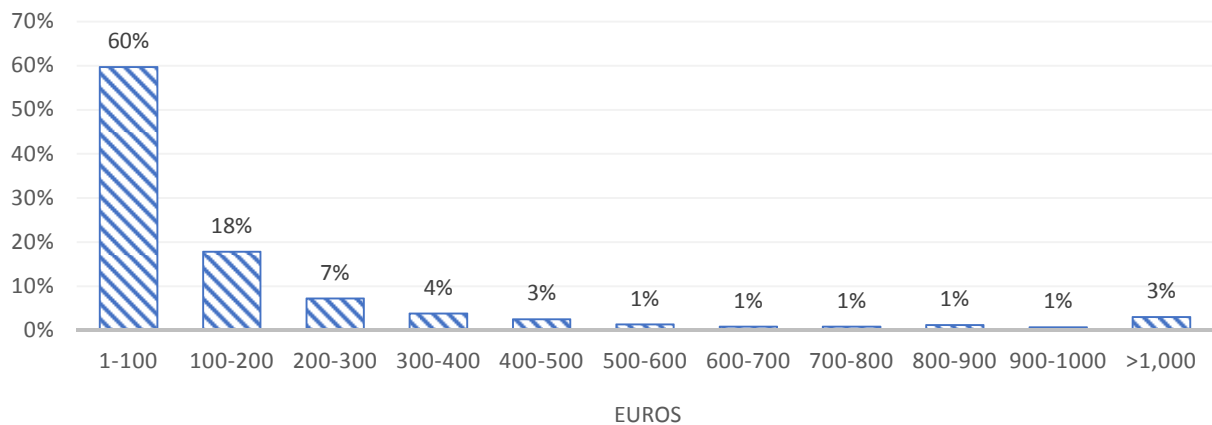
as long as the languages they spoke also included French. Looking at Brussels region, the French language is dominant, with one-third of the workers speaking only French and the share of workers speaking only Dutch close to nil. The share of workers speaking all three languages, however, is substantially higher among the earners and relatively more than for the entire country.

Figure 4. Language skills of the ListMinut labour force



The earnings from the platform alone during the two-year sample period were clearly insufficient to make a living. On average, the 764 earning workers received €200 after the deduction of fees on the tasks intermediated through the platform. About 60% of the workers earned up to €100, while another 32% earned between €100 and €500. All in all, only 9% earned more than €500. The maximum amount earned is €5,663.

Figure 5. Distribution of earnings after fees on the platform (€, Dec. 2013-Dec. 2015)

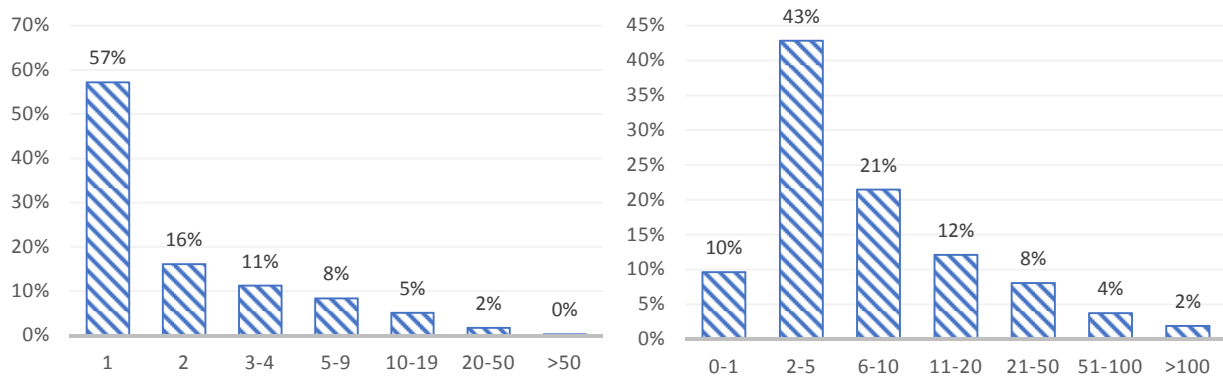


Source: Authors' elaboration.

Most of the workers made these earnings by performing a single task. In fact, 57% of the workers completed just one task during the two years, 16% completed two tasks and 27% worked on three or more tasks. Those with a very high number of tasks – completing between 20 and 78 tasks – represent only 2% of the earning workers. The number of hours worked is also fairly limited for most of the workers. Approximately one-half of the workers performed tasks requiring up to five hours. Again, only 2% counts more than 100 hours of work on the platform.



Figure 6. Number of tasks completed (lhs) and number of hours worked per worker (rhs)



Source: Authors' elaboration.

What emerges from the analysis of the ListMinut data is that the platform is surely not a source of income that is comparable to a full-time job, but rather is a source of complementary income. One limiting factor could be the size of the platform itself, which also was a key finding in another case study on an on-demand platform, called CoContest (see Maselli et al., 2015). It too did not generate sufficient assignments to allow the interior designers whose work it intermediates to make a living. This might be a feature of the early stages of development of the on-demand platforms, but it may also be a consequence of the flexibility demanded by part of the workers.

Recent studies show that the digital labour market forms the primary source of income for only for a fraction of workers. For instance only 10% of the workers (also known as taskers) run tasks through the TaskRabbit platform as a full-time job (TaskRabbit blog, 2014). Some 29% of the freelancers surveyed in the latest RFS 1099 Report,<sup>6</sup> affirm that sharing economy jobs account for 75 to 100% of household income (see Bloomberg, 2015). Similarly, Hall & Krueger (2015) argue that more than one-half of UberX drivers choose to drive for less than 15 hours a week, and 85% chose to drive less than 35 hours a week.

Another possibility could be that the connection is first made through the platform and that the relationship is then continued afterwards out of sight of the platform. For example, in the case of ListMinut, if the demander likes the gardener the first time, s/he might not use the platform the second time to find a gardener, but would just call the same worker who performed the task the first time.

<sup>6</sup> Survey conducted in May 2015 by the group Requests for Startups (RFS) of so-called '1099 workers', which is a reference to the '1099'-form that businesses, non-profits and government agencies must complete and submit to the US Internal Revenue Service when they pay someone \$600 or more a year in non-employee compensation. The term has become synonymous with the on-demand economy – at least in the US.

*Box 2. Lessons from TaskRabbit*

The ListMinut portal is comparable to its larger American rival TaskRabbit. Although there are many similarities, there are also some important differences. Founded in Boston in 2008, the US platform, with 1.25 million users and over 30,000 workers, is substantially larger than ListMinut, which recorded 14,113 workers as of the beginning of 2015.

What is interesting about its short history is that in mid-2014 the company reorganised its business model after observing a decline in the percentage of completed tasks, despite the large supply and demand for services (Isaac, 2015). Design issues were interfering with the potential success of the model. On the side of the users, complaints concerned the time it took for contractors to bid on their jobs, together with setting a starting price. Workers reported taking a long time to find suitable matches (Isaac, 2015; Newton, 2014).

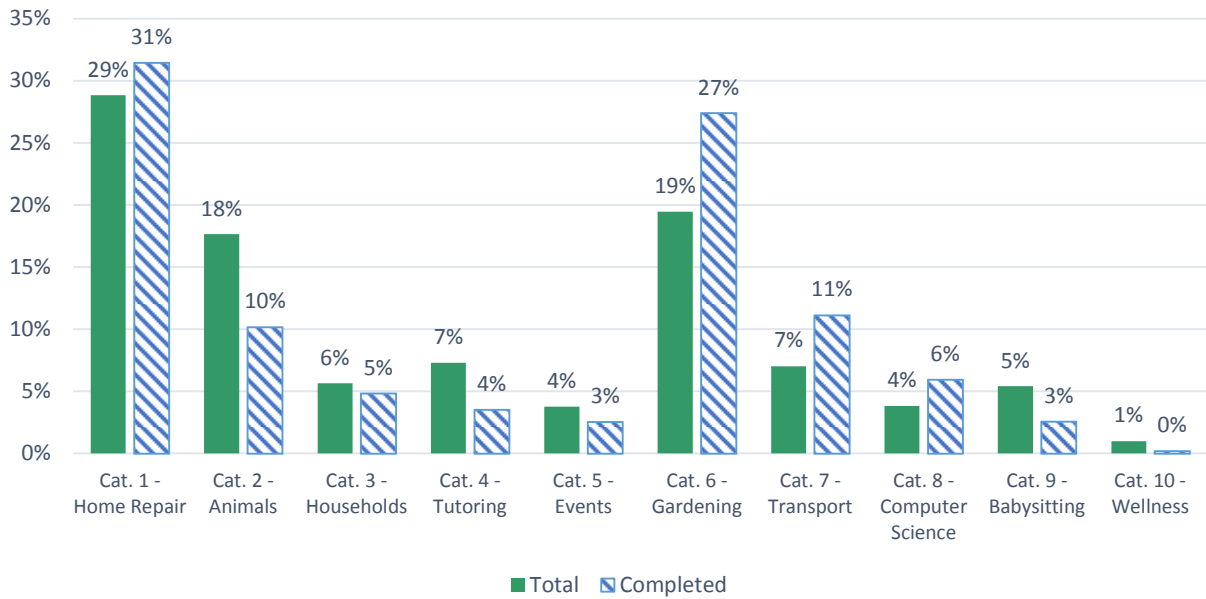
Major changes have since been implemented. An algorithm has been developed to assign tasks to workers with compatible skills. Taskers have to signal their availability to work via the in-app calendar and accept or refuse within 30 minutes. Moreover, Task Rabbit also promoted a stronger standardisation of its services by leaving less space to provide miscellaneous information in a worker's profile or in the task description and by replacing them with more detailed categories from which a user is obliged to select. The standardisation process includes the obligation for taskers to receive training and wear a uniform.

## 1.2 Distinguishing characteristics of the tasks

Only a minority of the tasks that have been posted during the sample period have been completed. In fact, between 23 December 2013 and 22 December 2015, 9,459 tasks have been posted on the platform, of which only 2,396 tasks or 25.3% have been matched and completed. To understand the differences between the tasks that have been posted and completed, this section examines the characteristics of both dimensions.

The database provides detailed information on the type of tasks demanded. These are grouped under 10 categories, of which the most popular, both among all and completed tasks are home repair, animal care and gardening (see Figure 7). Home repair and gardening form an even larger share of the completed tasks, while the substantial demand for animal care is only partially met. Of the less-demanded tasks, transport and computer science are relatively more often completed, while tutoring and babysitting are less often completed. The completed tasks seem to require more general or lower skills than the relatively less-often completed tasks.

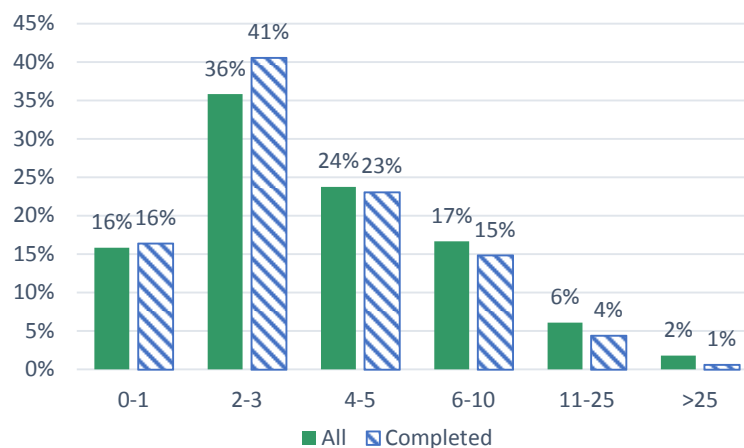
Figure 7. Distribution of tasks by category



Source: Authors' elaboration.

Turning to the characteristics of the tasks, the preference for tasks with a certain duration might indicate the contribution the task may make to the income of the worker. Hence, workers who use the on-demand platform to replace their income might, *ceteris paribus*, prefer to perform longer tasks, while workers who are trying to increase their income might prefer to have shorter tasks that can be more easily combined with other activities. As shown in Figure 8, the demanders indicate that most tasks take up to 5 hours. The time required for the tasks is fairly similar for the entire sample and for the completed tasks, although tasks requiring up to 3 hours account for more tasks than tasks of other durations.

Figure 8. Distribution of duration of tasks performed (hours)

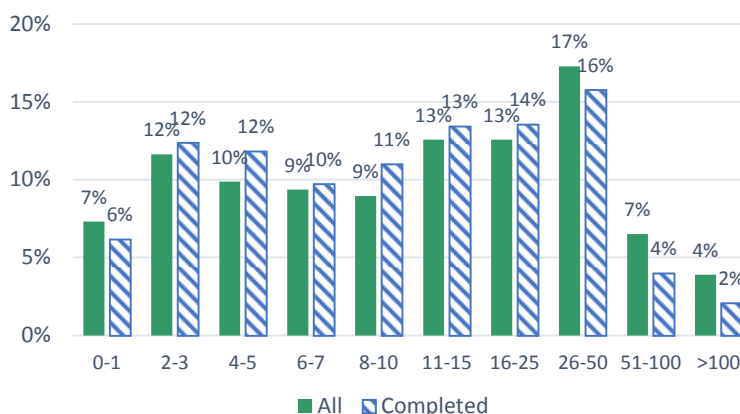


Source: Authors' elaboration.

The passage of time until the task can be performed might also make the task more or less attractive to workers. On the one hand, workers need response time to indicate their interest

in the task. On the other hand, the worker might not like to commit too long in advance, especially if s/he uses the platform to raise temporary earnings. Figure 9 shows the number of days between the posting of the task and the deadline the demander gave workers to respond, as a proxy for the performance of the task. Most of the tasks must be performed within one (38%) or two weeks (58%). The completed tasks record a similar response time, with a modest preference shown for more than one day, but within one week (40%) or two weeks (62%).

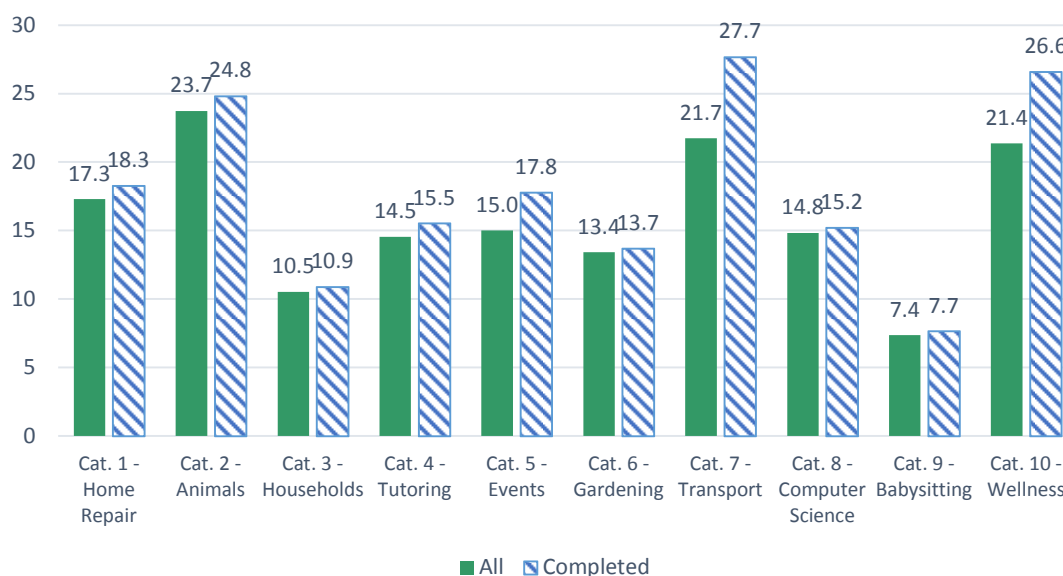
Figure 9. Distribution of response time (days)



Source: Authors' elaboration.

Looking at the earnings, one would expect that the tasks with the higher earnings would be more easily matched. Figure 10 shows the averages across the different categories, revealing that the earnings on completed tasks are in all cases above the hourly rates of not completed tasks. For most categories, however, the differences are fairly limited, except for transport and wellness, where the hourly earnings are more than €5 above the average for all posted tasks.

Figure 10. Average hourly earnings by category (€ per hour)



Source: Authors' elaboration.

## 2. Understanding the digital market for local services

This section assesses the profitability of the work contracted for via ListMinut. Possible explanations for the mismatch between supply and demand on the platform are also explored.

### 2.1 How profitable is it to work via the platform?

#### 2.1.1 *How do the earnings relate to the minimum wage?*

In Belgium, detailed legislation governs statutory minimum wages. The general legal minimum is €1,502 (gross per month), which is equivalent to an hourly wage of €9.12, if one considers a standard working week of 38 hours.<sup>7</sup>

When the legal minimum is compared with the remuneration on ListMinut, one should be aware of the fact that the minimum does not apply to freelance work, but only to employees. Nonetheless, the comparison is useful as it gives an indication of whether or not the minimum standards for a decent pay are being respected.

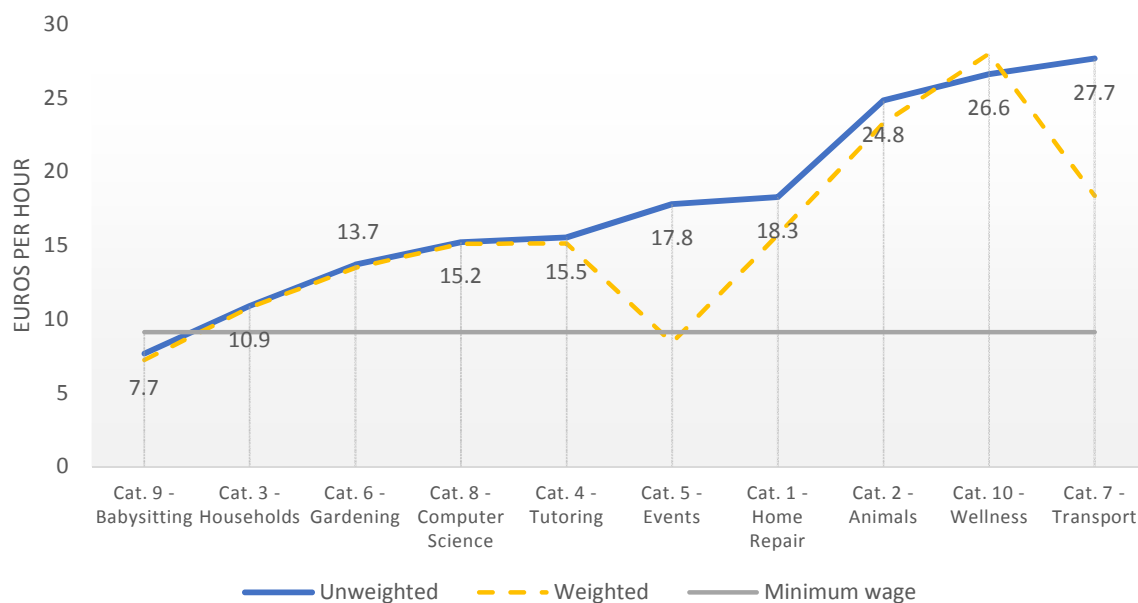
On average, workers are paid €17.8 per hour for completed tasks. The lowest-paid category is babysitting, with €7.7 per hour. The second-lowest is household services, such as cleaning and ironing. On the opposite end of the spectrum is transport, at €27.7 per hour. Tasks related to wellness (hairdressing, massage, etc.) and animal care are also relatively well paid, at more than €20 per hour. Hence, with the exception of babysitting activities, hourly compensation is constantly above the legal minimum.

To account for the fact that shorter tasks might be proportionally better paid, the dashed line in Figure 11 shows the average hourly remuneration weighted for the total number of hours. Even with this correction, the averages across all categories are above the minimum wage, except for babysitting and event planning. Overall, in more than 90% of the tasks the hourly earnings are above the minimum wage.

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<sup>7</sup> Students under 21 years of age can be paid at reduced rates. Detailed information is available at <http://www.werk.belgie.be/defaultTab.aspx?id=39004>.

Figure 11. Hourly earnings by category compared to minimum wage (€ per hour)



Source: Authors' elaboration.

The Belgian federal public service for work and social planning (SPF) also provides detailed information on the minimum wage in certain sectors. These rates depend on collective agreements, which can differ across the services in the category. For purposes of this study, the most common rates have been retrieved. The agreed amounts for 2015 are, for example, €11.75 for gardeners and €13.39 for builders (i.e. home repair). In all categories for which minimum hourly rates could be retrieved, the average earnings per hour on ListMinut are higher.

These findings suggest that platform work is not necessarily synonymous with exploitation.

### 2.1.2 How do the earnings relate to the traditional 'offline' labour market?

In a second step, the hourly remuneration by category is compared with its equivalent in the 'offline' labour market. Median wages for Belgium's offline market are taken from the Wage Indicator database, which contains wage data for more than 80 countries.<sup>8</sup>

The median wages for the ListMinut categories are matched with the equivalent in the Wage Indicator database. Whenever an exact match is not possible, a close equivalent in a subcategory was used. The number of observations for each corresponding category on Wage Indicator is reported in Annex 4. Finally, Wage Indicator allows one to group workers based on years of experience. Since the majority of the ListMinut workers are relatively young and presumably at the early stages of their career and the tasks are also performed by non-professionals, it is assumed that the workers have up to five years of experience. The comparison is thus not perfect. In particular, the comparison is made between the hourly pay of freelance workers and a much larger group of employees. Moreover, ListMinut uses a categorisation that does not match the international ISCO-08 standard, which makes it more difficult to find the corresponding offline wage for the various tasks.

<sup>8</sup> Two sub-websites exist for Belgium, one in French and one in Dutch. We consulted <http://www.votresalaire.be/main/salaire/comparezvotresalaire>.

Nonetheless, even taking these approximations and limitations into account, what emerges is the finding that workers in the digital labour market are not necessarily less well paid than those in the offline market. Remuneration is comparable in sectors such as event management and computer science. Home repair, animals, household services, tutoring, gardening, transport and wellness are paid better via ListMinut, while the median hourly rates for babysitting are below the payments on standard forms of labour.<sup>9</sup>

Table 1. Median gross hourly earnings by category (€)

Category	ListMinut (completed tasks)	Offline labour market	Difference
1. Home repair	17.50	12.70	+4.8
2. Animals	26.00	10.82	+15.18
3. Households	10.50	8.20	+2.3
4. Tutoring	15.00	13.06	+1.94
5. Events	13.00	12.12	+0.88
6. Gardening	13.00	11.35	+1.65
7. Transport	17.50	10.94	+6.56
8. Computer science	14.00	12.51	+1.49
9. Babysitting	7.67	10.78	-3.11
10. Wellness	26.00	10.29	+15.71

Source: Authors' elaboration based on data from Wage Indicator.

### 2.1.3 Can the platform compete with special arrangements for household services?

Besides the collective agreements, Belgium has some special fiscal arrangements for certain services,<sup>10</sup> one of which is household services for which it has a voucher system. The so-called 'titres-services' were introduced in 2004 with three objectives: reacting to the increase demand for household services, promoting better working conditions for the workers engaged in these activities and rescuing the sector from the shadow economy (Gerard et al., 2014).<sup>11</sup>

The sector counted in 2013 almost one million users and 150,000 workers (equal to 4.2% of total employment). These workers are employed with permanent (approximately one-third) or temporary contracts (approximately two-thirds) from authorised agencies (Gerard et al., 2014). Users currently pay €9 per hour, but this type of expenditure can be reported in tax

<sup>9</sup> The match between the babysitting category on ListMinut and a potential equivalent in ISCO is not perfect. The "child care workers" category in ISCO includes for instance also crèche or after-school care workers. The actual hourly wage is likely to be lower, looking for example at the remuneration for babysitters recommended by the Belgium parenting association "League of Families" of €4-6 per hour (Laligue.be).

<sup>10</sup> These special arrangements are intended to encourage formal employment in several European countries. Finland, France, Germany and Italy, for example, provide schemes for household services and/or personal services like cleaning, gardening, child and residential care as well as home repair (European Commission, 2015).

<sup>11</sup> In 2013, the latest full year in which household vouchers were a federal competence, about 951,000 people or about one-fifth of Belgian households used the vouchers and employed around 150,000 workers. The total gross public cost of the scheme was about €1.9 billion (Gerard et al., 2014).



declarations to receive a reimbursement, which makes the actual cost per hour €7.65.<sup>12</sup> At the same time, however, each worker receives a higher payment per hour, calculated by Gerard et al. (2014) at €11.06 per hour (gross) in 2013.

Looking at ListMinut, the demand for household services is relatively limited and the services are also less often completed. Only 534 tasks, or 5.6% of the total, fall in the category of “household services”, of which 116 or only 21.7% have been completed (25.3%). This was the case notwithstanding the fact that some 4,128 (or 29.2%) of the workers reported that they possessed the skills needed to perform at least one of the household tasks, which includes cleaning, ironing and cooking.

Interestingly the demanders of household services are willing to pay more than the vouchers would have cost them. In fact, the demanders of household services were willing to pay €12.27 on average per hour including fees, €4-6 above the after-tax costs of the titres-services. Given the administrative burden associated with enrolment in the system, a user might prefer ListMinut for occasional services and the titres-services for more regular ones.

In turn, the worker received €10.90 per hour for the completed work, which is roughly the same compared to the amount the worker receives under the voucher system (€11.06). The standard labour contract with the agencies, however, ensures not only a slightly higher remuneration, but also social security, such as sickness and maternity leave, pension and unemployment benefits.

The special arrangement for household services gives the platform a competitive disadvantage compared to the conventional offline labour market.

## 2.2 Who earns more on the platform?

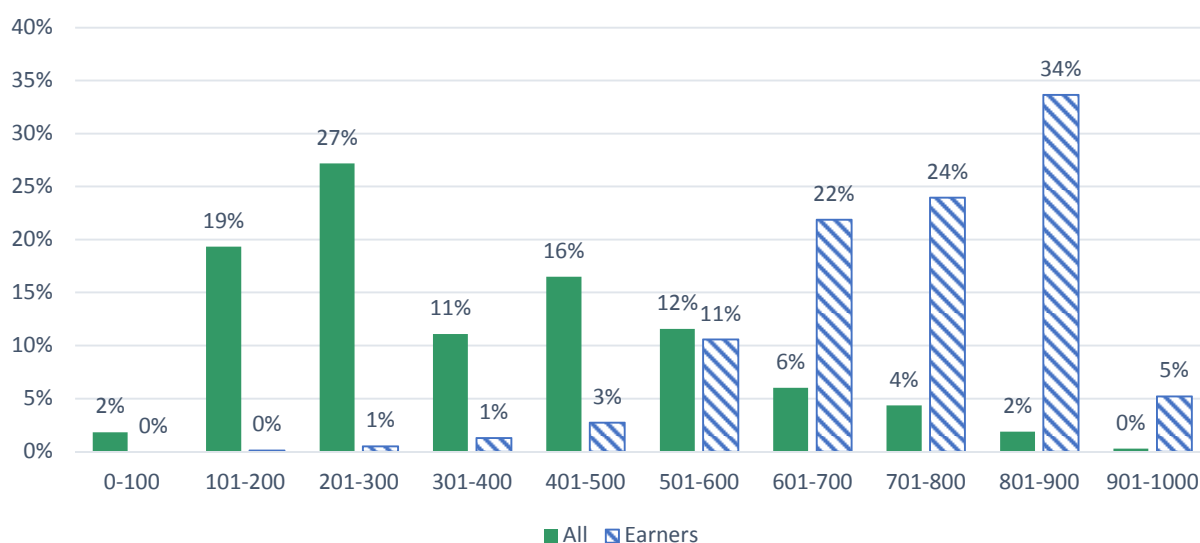
Detailed records on the workers and the quality of the work performed bring the digital labour market closer to a system characterised by perfect information. Reputation is key for the survival of a system where physical interaction is limited or impossible and therefore trust has to be established in alternative ways. In such system, reputation is an important determinant in the allocation of a task to a certain candidate.

While analysing UpWork, however, Lehdonvirta et al. (2015) noticed that the reputation system might amplify and to a certain extent even distort reputation. Profiles with good ratings tend to be disproportionately awarded more jobs. A ‘Matthew effect’, in which the “rich become richer”, might be produced in the digital labour market.<sup>13</sup> Such a dynamic seems to obtain also on ListMinut, where the earners have substantially higher confidence scores than the sample average (see Figure 12).

<sup>12</sup> Since July 2014, the household vouchers have become a regional competence, and the price varies across regions (i.e. €6.30/hour in Flanders, €7.65/hour in Brussels and €8.10/hour in Wallonia). The discount only applies up to a certain number of vouchers.

<sup>13</sup> There are two key consequences of this potential type of distortion: i) a strong disparity in the earnings of workers or simply wage inequality and ii) re-intermediation is created by those who are allocated many tasks as a result of their past performance and to cope with them ‘hire’ an army of helpers, a phenomenon observed especially in developing economies (Gray et al., 2016).

Figure 12. Distribution of the confidence scores, earners and non-earners compared



Source: Authors' elaboration.

To test the importance of the confidence score, a zero inflation Poisson regression<sup>14</sup> was performed with earnings and tasks as the dependent variables and a series of explanatory variables, using different specifications for the workers. See Table 2 for the results and Annex 2 for a description of the variables. Workers with a stronger confidence score are awarded more tasks. If the confidence score is squared, the relation is even stronger, suggesting that the relative benefits are higher when the confidence score increases.

Another element influenced by the platform, the number of offers sent to workers, is also positive and significant. Hence, the more offers a worker receives, the higher his/her earnings and the more tasks s/he is likely to complete.

Age also repeatedly stands out as a significant variable across different specifications, with the expected sign. The results confirm that youth pays a penalty in the labour market due to their lack of experience. Hence, older workers have significantly higher earnings and more tasks than younger workers.

The results further indicate that female workers have lower earnings and fewer completed tasks. The results for the number of tasks are significant at the 1% level, while the results for earnings are not all significant.

<sup>14</sup> This technique is used to address the many zeros and the fact that the dependent variables are counted. For the same reason it was also not possible to use the natural logarithm of the earnings (WKR\_EARNS) as the dependent variable.

Table 2. Results zero inflation Poisson regressions for worker earnings and tasks

Variables	EARNINGS (WKR_EARNS)		TASKS (WKR_TASKS)	
	1	2	3	4
Confidence score (WKR_CONF)	0.003***	0.006***	0.009***	0.012***
Age of the worker (WKR_AGE)	0.021***	0.022***	0.021***	0.020***
Dummy for Gender [1=female] (WKR_FEMALE)	-0.121	-0.468***	-0.491***	-0.743***
Dummy for language skills [1=speaks Dutch] (WKR_NL)	0.142	0.088	-0.033	-0.070
Number of offers received (WKR_OFFERS)	0.019***		0.015***	
CONSTANT	1.926***	-0.122	-7.416***	-9.236***
	Inflate			
Number of days active on the platform (WKR_DAYS)	0.000***	0.002***	-0.001***	-0.001***
CONSTANT	1.869***	1.737***	-0.014	-0.071
Observations	5,743	10,158	5,743	10,158
Non-zero observations	651	659	601	604
Wald chi2	242.48	153.07	929.89	796.42
Prob > chi2	0.000	0.000	0.000	0.000

Notes: The asterisk signs indicate the significance levels at 1% (\*\*\*), 5% (\*\*) and 10% (\*) respectively. WKR\_EARNS: Total earnings; WKR\_TASKS: Total number of days required. See Annex 2 for the detailed description of the variables.

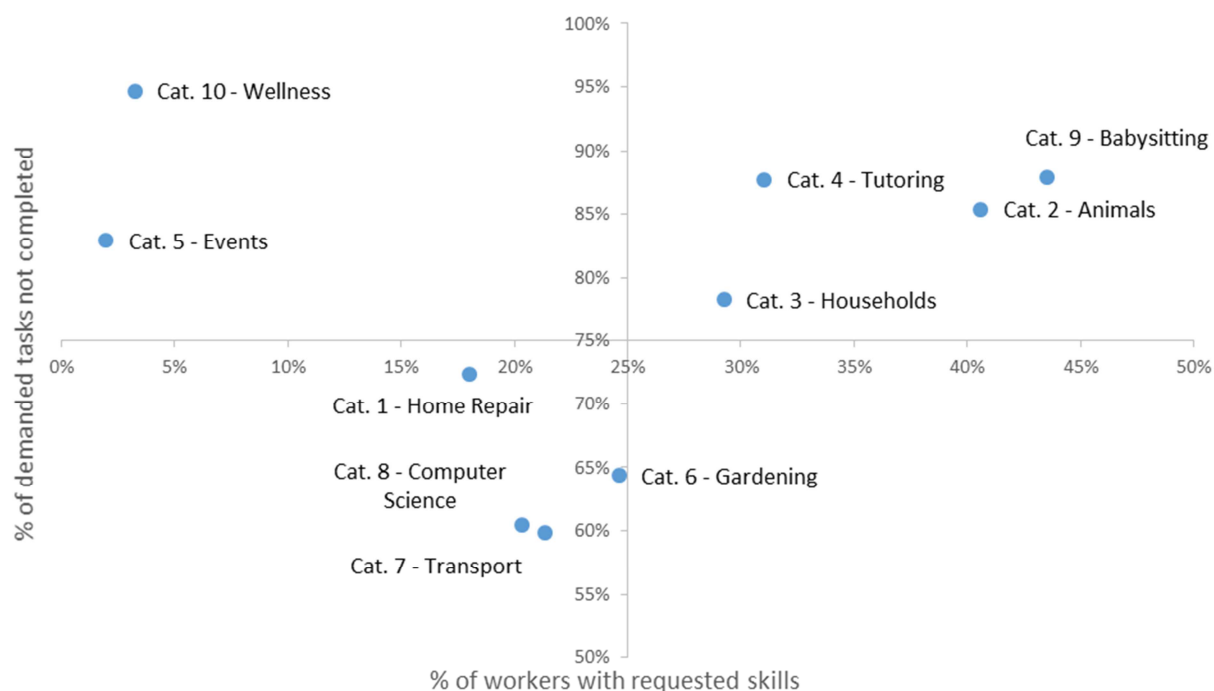
Source: Authors' elaboration.

### 2.3 Why is there a large unmet demand?

One of the findings that emerged in this analysis is that the intermediation through the platform is very inefficient: only one in four tasks posted is completed. This section tries to explain why so many tasks are not intermediated.

The level of completed tasks varies across categories. Figure 13 shows a scatterplot with the share of tasks not completed by category (vertical-axis) and the share of workers available for the same category (horizontal-axis). In six out of ten categories, on average more than 75% of the tasks are not matched or completed. For wellness and event planning, this may be explained due to a lack of supply of workers, while for tutoring, babysitting, household services and animal care, only a limited share of the tasks is completed despite the fact that a large share of the workers have indicated that they possess these skills.

Figure 13. Matching demand and supply of tasks



Source: Authors' elaboration.

A simple economic explanation for the mismatch might be that the price offered for the tasks is below the amount demanded by the worker. Based on the previous discussion, this might for example be the case for babysitters, tutors and household services, where remuneration is below the traditional labour market. However, the same might not be true for pet-sitters.

To disentangle which factors are mostly influential in terms of the probability that a service will be completed, we ran a Probit regression. The dummy variable for completion of a task was regressed over the hourly earnings for the worker, the duration of the task in hours, the time to respond to the task, the share of the workers indicating that they possess the skills and the number of tasks demanded by the users.

The results of the regression in Table 3 show that a higher price per hour positively influences the probability of a task being completed. Another more remarkable result is that when a larger share of the workers indicate that they possess the requested skill, it is less likely that the service will be completed. We acknowledge that currently any explanation for this phenomenon would be a guess, but it might be found in the design of the platform. In fact, a limited number of workers receives a request to provide the task. Moreover, the results confirm the observations from the discussion of the task characteristics, namely that workers have a preference for shorter tasks and response-time, although the impact is limited on whether a task is completed or not. In addition, the more often the user posts tasks, the more likely it is that these tasks are completed. Besides a learning curve, this might also signal that demanders who have positive experiences in having their tasks completed are more likely to remain active on the platform.

The overall explanatory power of the model, however, signals that some important elements are not being captured or that the platform is inefficient.

Table 3. Results Probit regressions for completed tasks

Variables	TASKS COMPLETED (TSK_COMP)		
	1	2	3
Price per hour received by worker (TSK_PRCHR)	0.007***	0.008***	0.009***
Time required for the task (TSK_HRS)	-0.012***	-0.011***	-0.012***
Number of days to respond to offer (TSK_RESP)	-0.00043***	-0.00044***	-0.00046***
Share of the workers who possess required skill (WKS_SKL)			-1.512***
Number of tasks posted by user (USR_TSK)		0.09***	0.081***
CONSTANT	-0.67***	-0.873***	-0.487***
Observations	8920	8920	8920
Pseudo R2	0.008	0.027	0.038
Prob > chi2	0.000	0.000	0.000

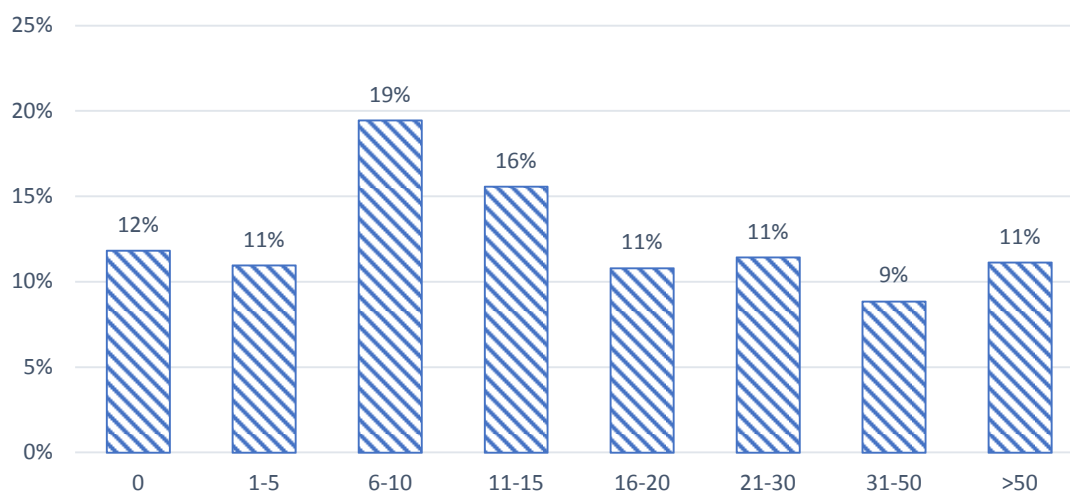
Notes: The asterisk signs indicate the significance levels at 1% (\*\*\*), 5% (\*\*) and 10% (\*) respectively. TSK\_COMP: Dummy for completion [1=task completed]. See Annex 3 for the detailed description of the variables.

Source: Authors' elaboration.

A variable that merits further study in order to understand the likelihood of a successful match is the distance between the demander and the worker. This has also been found to be relevant on TaskRabbit. Cullen & Farronato (2014) observe that the geographical distance between the user and the worker is one of the two main factors influencing the likelihood of a task being completed, the other being the specificity of the task. These two factors also explain why matches are more common in one city than in another. Hence, even though the price and type of task are suitable for a worker, s/he still might not respond because of the time and costs necessary to undertake it.

The distance variable cannot be used for the estimation given that it is only observed for completed tasks (meaning a dummy TSK\_COMP is equal to 1). Figure 14 shows the estimated distance between the worker and the location of the task. It reveals that 12% of the tasks are performed by workers from the area with the same postal code, while another 57% of workers are based within 20 km from the task location. In turn, workers living more than 50km from the task posted perform 11% of these tasks.

Figure 14. Estimated distribution of the distance between the workers and tasks (km)



Source: Authors' elaboration.

### 3. Conclusions

Today's digital labour market might be best described as a 'one-night stand', with more than half of the earning workers completing no more than one task. At its current stage, the platform does not provide sufficient income to be a credible substitute for an offline job. The maximum amount earned by a single worker during the two-year sample period is €5,663, but the majority of the earning workers received only between €1 and €100. Moreover, 95% of the workers did not earn a single euro.

There are three possible explanations for these low earnings. One is that the platform is simply too small to be able to provide individuals willing to work with a sufficient number of tasks to generate the equivalent income of a full-time job. A second explanation is that the true nature of on-demand work is as a complement to and not a substitute for a full-time income. Finally, it may be the case that the platform is only used to get in contact with potential new demanders who might generate more tasks outside the platform.

The on-demand economy, however, maybe tomorrow's land. This analysis of ListMinut reveals that the supply of work is dominated by young workers, who are destined to become the prime-age workers of tomorrow. The cohort below 30 years of age constitutes 69% of the workers and 54% of those who undertook at least one task via the platform. This could reflect the fact that they are 'digital natives', as well as the difficulty of finding a job in today's regular labour market. The same, however, cannot be said for female workers: their supply is equal to male workers but the demand less so. This might be a consequence of the fact that the most demanded services via ListMinut are typically male-dominated: such as home repair, transport and gardening.

One could fear that the on-demand economy will trigger a race to the bottom of remuneration and working conditions. Or in the words of Robert Kuttner (2013): "That's what makes it a metaphor for the new economy, a dystopia where regular careers are vanishing, every worker is a freelancer, every labour transaction is a one-night stand, and we

collude with one another to cut our wages.” According to our analysis, this fear is not justified, at least not for the services which are locally provided. The hourly remuneration on ListMinut varies according to the category, but works out on average at €17.8/hour after fees. A gardener receives on average €13.7/hour, compared to the €27.7/hour earned by someone who helps with transport. In all cases, however (except for babysitters), remuneration is in line with or above the Belgian minimum wage. Moreover, in four out of ten sectors (home repair, transport, dog sitters and wellness), the pay is also above the median equivalent salary of an employee in a similar category. Computer sciences, events planning and gardening are in the same pay range. In contrast, babysitting, tutoring and household services are more generously rewarded among basic forms of labour. The latter category deserves special mention since it faces the competition of the titres-services. Although hourly remunerations are roughly the same, the government initiated voucher system offers better conditions to the workers.

Another important point that emerges from the analysis is that the reputation plays an important role in the success of all participants in the platform. This does not come a surprise: reputation is key for the survival of a system where physical interaction is limited or impossible and therefore trust has to be established in other ways. The creation of indicators to rate the quality of the work and (more or less) detailed descriptions of the performance are useful tools to signal reputation. However, our analysis confirms that they can also be a source of distortion in the market via the so-called ‘Matthew effect’, whereby the rich become richer and the poor become poorer. The more projects are completed, the more projects are assigned to the worker with a high rating, more than proportionally given his/her quality and prices. Thanks to this type of system, information becomes more transparent but it is still not perfect. If one imagines that this system is transferred to a very large scale, it could become an additional source of income inequality.

On the other hand, a large share of the posted tasks are not completed. A regression analysis explains that this is due to the characteristics of the tasks (e.g. price, hours, and time to respond) and the design of the platform, which seems not able to mobilise workers in the categories for which most workers indicate they possess the required skills. Distance between the demander and the task might also play a role. These issues, also experienced in the past by TaskRabbit, can pose strong limits to the scaling up of the platform.

Further research will be needed to better understand the economics of the on-demand economy as well as its consequences for the labour market. More in-depth studies of other platforms would be desirable, especially to test if the conclusions from this case study on ListMinut also hold for other platforms. A survey of European digital workers would also be useful, especially in light of the fact that the few surveys conducted so far have focused only on the American labour market. Case studies and surveys would compensate for the lack of official statistics. Moreover, the on-demand economy is still evolving, which requires repetition of research over time to test whether the findings are still valid.



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## Annex 1. Detailed description of the intermediation process on ListMinut

The platform tries to bring together demanders of tasks and workers. ListMinut defines six steps for the demander to complete: i) demand a service, ii) contact workers, iii) choose a worker, iv) authorise payment, v) receive personal information about the selected worker and arrange for the task to be performed and vi) pay worker and evaluate his/her performance. In turn, ListMinut defines five steps for the registered worker to perform a task: i) search for a job or receive an email with a notification of a suitable task, ii) apply for the task, iii) execute the task, iv) finalise the task and vi) receive payment within 10 working days.

One can combine these various steps for the demander and the worker into an integrated process, as explained below:

- i) The potential worker needs to create a profile on the platform. The worker, who must be at least 16 years old, determines how much information (s)he wishes to provide, but the more (certifiable) information he provides, the higher the confidence score he obtains. The most complete profiles with the maximum confidence score of 1,000 include a profile picture, name, age, date when the account was created, location, skills (up to five), brief bio, diplomas earned and languages spoken (Dutch, French and/or English). In addition, the profile indicates whether the telephone number, identity card, photo and social network(s) have been validated. It also shows the tasks that the person has previously executed via the platform, including the evaluation.
- ii) Anyone who wants to request a task to be performed must register and provide a brief description of the task; some useful information on the task (i.e. date, material required, indication of the size, photos, etc.); the type of task; the price the demander is willing to pay; the time that the demander thinks it requires to perform the task; the location where the task is to be performed (i.e. town/village and postal code); and a date by which time potential worker must respond to the request. The website provides demanders with a drop-down menu of standard services from which to choose. Based on this selection, the website advises the demander on an appropriate timeframe and price per hour for the task, by pre-filling the form. The demander has the possibility to change both the time and price, but the system imposes certain constraints. The task must require at least one hour and a maximum of 15 weeks. The total price of the task can range between €15 and €500.
- iii) After the form is submitted, up to 100 of the most-suitable workers are notified that they have been selected as candidates for the task on the basis of their confidence scores in the region where the task is to be performed and the task is published for all workers to see. It is possible for the demander to select a preferred person to conduct the task (i.e. only workers with a confidence score of at least 400 are shown). The profiles on the website are presented per type of activity and location. The providers are shown with their profile, including photos and the evaluation score according to their confidence score (i.e. highest confidence score on top).
- iv) The worker can apply for tasks for which they receive a notification or think would be of interest to them. The page with the information that they can see provides only information on the task, an indication of the location (i.e. postal code and village), the date it was posted and the first name of the demander with a link to the brief user profile. Although personal details of the demander are not provided, workers have the possibility to contact the demanders, according to the platform to get some more

information on the task. Workers can express their interest in a task by pressing the application button.

- v) The demander can see on his/her user page which of the workers might be willing to perform the task. The page shows the picture and name of the workers that accepted the offer and provides a link to the profile-page of the worker. In addition the page shows the distance in km to the worker as well as the confidence score and the evaluation score provided by demanders of previous jobs. The candidates are listed according to their confidence score (i.e. highest confidence scores on top). The demanders can accept the offer by pressing an accept button.
- vi) The demander authorises the payment details. In addition, ListMinut provides him/her with optional insurance against potential complications. Hence, no money is transferred at this stage.
- vii) The task is now carried out at this stage in the process. The demander obtains access to the contact details of the worker (e.g. e-mail and telephone number) to agree on the practicalities, such as the time and date as well as the exact location where the service will be performed.
- viii) Once the work is performed, the worker notifies the demander on his/her personal page. The worker can also leave the job open or remove it from his/her account.
- ix) After the worker signals that the task is completed, the demander receives a request from the system to confirm that the task is completed. Hence, it is the demander who finally approves the payment and indicates whether the price paid should be increased and provides an online evaluation of the worker's performance. The evaluation consists of a rating from 1 to 5 and short written comments.
- x) Finally the worker needs to validate his/her payment details and confirm that s/he has acted according to the specified general conditions.

## Annex 2. Description of dataset on workers

Indicator	Description	Source
wkr_name	The first name of the worker	ListMinute.be through crawl
wkr_pstcd	The postcode of the location where the worker lives	ListMinute.be through crawl
wkr_prov	Province in which the worker indicates to live based on postcode	bpost
wkr_age	The age of the worker as of December 2015 indicated by the worker	ListMinute.be through crawl
wkr_female	Dummy variable for gender of the worker based on the first names at more than 95% confidence level (1=female and 0=male)	Statistics Belgium
wkr_en	Dummy variable for English language skills of the worker (1=speaks English and 0=Does not speak English)	ListMinute.be through crawl
wkr_fr	Dummy variable for French language skills of the worker (1=speaks French and 0=Does not speak French)	ListMinute.be through crawl
wkr_nl	Dummy variable for Dutch language skills of the worker (1=speaks Dutch and 0=Does not speak Dutch)	ListMinute.be through crawl
wkr_skls	Number of different tasks the worker indicates to be able to perform (max. 5 out of the 50 tasks offered)	Based on crawled data
wkr_sk1hmrep	Dummy variable for workers indicating that they possess the skill to perform at least one type of home repair-tasks (1=skill is painter, electrician, joiner, plumber, household electrical repair, and/or handyman and 0 otherwise)	Based on crawled data
wkr_sk2anim	Dummy variable for workers indicating that they possess the skill to perform at least one type of animals-tasks (1=skill is pet sitter, walking the dog and/or providing dog care and 0 otherwise)	Based on crawled data
wkr_sk3house	Dummy variable for workers indicating that they possess the skill to perform at least one type of household-tasks (1=skill is cooking, sewing, cleaning and/or ironing and 0 otherwise)	Based on crawled data
wkr_sk4tut	Dummy variable for workers indicating that they possess the skill to perform at least one type of tutoring-tasks (1=skill is providing language classes, music lessons, sports lessons, cooking classes and/or tutoring and 0 otherwise)	Based on crawled data
wkr_sk5evts	Dummy variable for workers indicating that they possess the skill to perform at least one type of event-tasks (1=skill is photographer, magician, musician, DJ, clown and/or caterer and 0 otherwise)	Based on crawled data
wkr_sk6gard	Dummy variable for workers indicating that they possess the skill to perform at least one type of gardening-tasks (1=skill is gardening and providing heavy yard work and 0 otherwise)	Based on crawled data

wkr_sk17trans	Dummy variable for workers indicating that they possess the skill to perform at least one type of transport-tasks (1=skill is moving, coarse dirt and/or delivery and 0 otherwise)	Based on crawled data
wkr_sk18comp	Dummy variable for workers indicating that they possess the skill to perform at least one type of animals-tasks (1=skill is repair and troubleshooting, assistance and training and/or designer and 0 otherwise)	Based on crawled data
wkr_sk19baby	Dummy variable for workers indicating that they possess the skill to perform at least one type of computer science-tasks (1=skill is one-time and/or recurring babysitter and 0 otherwise)	Based on crawled data
wkr_sk110well	Dummy variable for workers indicating that they possess the skill to perform at least one type of wellness-tasks (1=skill is beauty, relaxation and/or senior home care and 0 otherwise)	Based on crawled data
wkr_offers	Number of offers received from the platform	ListMinute.be through crawl
wkr_conf	The confidence score is a score between 0 and 1,000 awarded by the platform	ListMinute.be through crawl
wkr_create	Date at which the worker created its account	ListMinute.be through crawl
wkr_date	Days between date at which the account was created and 22 December 2015.	Based on crawled data
wkr_tasks	Number of tasks completed between 23 December 2013 and 22 December 2015	Tasks-dataset
wkr_hrs	Number of hours worked based on the cumulative number of hours required according to the demands of the service	Tasks-dataset
wkr_earn	Cumulative earnings based tasks completed between 23 December 2013 and 22 December 2015 and the price net of fees	Tasks-dataset
wkr_earning	Dummy variable for workers that have completed tasks successfully between 23 December 2013 and 22 December 2015 (1=Completed task successfully and 0 otherwise)	Tasks-dataset

### Annex 3. Description of dataset on tasks

Indicator	Description	Source
tsk_comp	Task is completed; determined based on whether evaluation is requested	Based on crawled data
tsk_prcnt	Price offered for the task by worker after deduction of fees	ListMinute.be through crawl
tsk_prchr	Price after deduction of fees offered for the tasks per hour	Based on crawled data
tsk_fee	Fee estimated based on fee structure provided by ListMinut.be	Calibrated
tsk_prcgr	Price offered for the task by worker calibrated using the price after fees plus estimated fees	Calibrated
tsk_hrs	Number of hours the demander of the task expect it to last. In order to get the number of hours for all tasks, it was assumed that a week has 38 working hours with 7.5 hours per day. The number of hours worked for pet sitting is adjusted for comparison reasons, i.e. it is assumed that the pet sitting takes app. 0.5 hours a day once it is for more than one day	ListMinute.be through crawl
tsk_pstcd	The postcode of the location where the task needs to be performed	ListMinute.be through crawl
tsk_prov	Province in which the task should be performed, determined based on the postcode for the task provided	bpost
tsk_dist	The distance between the location of the worker and task in km, determined based on the distance between the geographical locations of the postcodes of both the worker and the task	Google Maps
tsk_cat1hmrep	Dummy variable indicating that the task belongs to the home repair-category (1=task is for a painter, electrician, joiner, plumber, household electrical repair, and/or handyman and 0 otherwise)	Based on crawled data
tsk_cat2anim	Dummy variable indicating that the task belongs to the animals-tasks (1=skill is pet sitter, walking the dog and/or providing dog care and 0 otherwise)	Based on crawled data
tsk_cat3house	Dummy variable indicating that the task belongs to the household-category (1=task is cooking, sewing, cleaning and/or ironing and 0 otherwise)	Based on crawled data
tsk_cat4tut	Dummy variable indicating that the task belongs to the tutoring-category (1=task is providing language classes, music lessons, sports lessons, cooking classes and/or tutoring and 0 otherwise)	Based on crawled data
tsk_cat5evts	Dummy variable indicating that the task belongs to the event-category (1=task is for	Based on crawled data



	photographer, magician, musician, DJ, clown and/or caterer and 0 otherwise)	
tsk_cat6gard	Dummy variable indicating that the task belongs to the gardening-category (1=task is gardening and providing heavy yard work and 0 otherwise)	Based on crawled data
tsk_cat7trans	Dummy variable indicating that the task belongs to the transport-category (1=task is moving, coarse dirt and/or delivery and 0 otherwise)	Based on crawled data
tsk_cat8comp	Dummy variable indicating that the task belongs to the animals-category (1=task is repair and troubleshooting, assistance and training and/or designer and 0 otherwise)	Based on crawled data
tsk_cat9baby	Dummy variable indicating that the task belongs to the computer science-category (1=task is one-time and/or recurring babysitter and 0 otherwise)	Based on crawled data
tsk_cat10well	Dummy variable indicating that the task belongs to the wellness-category (1=task is beauty, relaxation and/or senior home care and 0 otherwise)	Based on crawled data
tsk_resp	Number of days that the demander gave to the workers to show their interest based on the date that the task was posted and end date that was given signal the interest in the task	Based on crawled data
wks_avl	Number of trusted workers that could perform the task according to the platform	ListMinute.be through crawl
wks_skl	Share of the workers that indicates to possess the skills to perform the task [scale: 0 to 1]	Workers-dataset
usr_tsk	Number of tasks posted by user between 23 December 2013 and 22 December 2015	Based on crawled data



#### Annex 4. ISCO categories used for comparison

ListMinut		Wage indicator-equivalent			
Code	Category	ISCO-08 Code	Category	Observations (All)	Observations (0 to 5 years' experience)
100	Home repair	71	Building and related trades workers, excluding electricians	1,470	658
200	Animals	5164	Pet groomers and animal care workers	52	38
300	Household	5152	Domestic housekeepers	26	8
400	Tutoring	2353	Other language teachers	16	7
		2354	Other music teachers	9	6
		2359	Teaching professionals not elsewhere classified	37	15
				62	28
500	Events	343	Artistic, cultural and culinary associate professionals	905	455
600	Gardening	6113	Gardeners, horticultural and nursery growers	192	117
700	Transport	8322	Car, taxi and van drivers	313	156
800	Computer science	351	Information and communications technology operations and user support technicians	1,517	854
900	Babysitting	5311	Child care workers	685	504
1000	Wellness	514	Hairdressers, beauticians and related workers	541	385

Source: Authors' elaboration based on ListMinut crawled data and wage indicator.