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(Occasional Papers)

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THE (LITTLE) REALLOCATION POTENTIAL OF WORKERS MOST HIT BY THE COVID-19 CRISIS

by Gaetano Basso*, Adele Grompone** and Francesca Modena***

Abstract

The accommodation and food services and entertainment and sport activities are the worst hit by the economic crisis that followed the COVID-19 pandemic. The possibility for these workers to find new jobs might be limited due to low competence and skill levels. We study the employment transitions of these workers before the COVID-19 crisis in Italy and find that, in the medium run, workers employed in accommodation and food service activities were as likely to be employed as those in other non-financial private services were. Entertainment sector employees instead had a higher probability of being non-employed compared with other non-financial private services; if they found a job, these workers moved more frequently to other sectors and occupations. To get insights into the potential for reallocation during the pandemic and post-pandemic periods, we perform a simple counterfactual exercise based on the similarity in skill demand: the evidence indicates there is little reallocation potential for these hard-hit workers, especially if service demand remains depressed for a long time.

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1. Introduction[*]

Accommodation and food service activities, as well as entertainment and sport services, are the sectors worst hit by the economic crisis that followed the COVID-19 pandemic (OECD, 2020).[1] Sectoral lockdown and stay-at-home orders, social distancing measures and mobility restrictions adopted to contain the pandemic forced these sectors to reduce their operations drastically since March 2020. The staggered re-opening of economic activities since May involved these sectors only marginally, as they present several risks for the safety of workers and customers due to physical proximity in the workplaces (Barbieri et al., 2020); similarly, they were the first to be forced to limit their activities during the second wave that hit several European countries in autumn.

On the demand side, consumers have been reducing their demand for non-essential goods and services (e.g., restaurants, sports and entertainment activities); they do more so if these activities place them at risk of infection (del Rio-Chanona et al., 2020). Moreover, the re-opening of cross-country borders remains partial and limits to international travel persist, which puts severe strains on the tourism sector. Indeed, data on tourism flows in Italy showed a drop of about 80 percent in June and 50 percent in July with respect to the same months of 2019 (-93 and -76 percent for flows from abroad).[2] The effects of the deep recession and the high level of uncertainty about the evolution of the pandemic and of the recovery have been particularly marked in the activity of small businesses and leisure-related consumption in the first pandemic wave (Chetty et al., 2020). The decline in disposable income and changes in consumers' preferences in response to infection risk may slow down the recovery in the hospitality and recreational sectors even once effective COVID-19 treatment or vaccine will be available on a wide range. On the supply side, workers may be reluctant to work in an infection-prone environment and they may favour safer sectors that, however, could require higher skills and better qualification.

In any case, there will be the need for workers to reallocate from declining to expanding sectors and jobs (OECD, 2020). The consequences for hardly-hit workers can be dramatic if their ability to find a new job is limited due to a mismatch of competence and skills; the reallocation process could be eased instead if labour demand will improve in sectors and professions with qualification levels similar to those usually requested in accommodation, food service, and entertainment sectors.

Indeed, hospitality and recreational sectors differ in terms of education and skills, as well as regarding training and experience that workers acquire on the job. The accommodation and

[1] In the rest of the paper, we will refer to the accommodation and food service and hospitality sectors interchangeably. Similarly, we will refer to entertainment and sports sectors and recreational sectors interchangeably.
[2] Osservatorio Federalberghi, available at https://www.federalberghi.it/comunicati/all-comunicati-stampa.aspx (in Italian).

food industry is often perceived as being low-skilled, performing relatively easy to learn tasks, and without long-term career opportunity (Blake et al., 2006; Szivas and Riley, 1999). In Italy, compared to the rest of the economy, workers in accommodation and food service activities are less educated (in 2019, only about 8 percent of workers had a university degree versus an average of 22 percent); they usually belong to low-qualification occupations (86 percent versus 27 percent).[3] Recreational workers instead have, on average, a higher level of education (in 2019, 28 percent had a university degree, with a high incidence of specialization in sport, art and music) and a lower share of low-qualification occupations (28 percent).

To investigate the potential longer-term consequences of the recession, in this paper we study employment transitions of workers in the accommodation and food service activities, and in entertainment and sport sectors. We exploit the universe of rich Italian administrative data on hirings and contract terminations (*Comunicazioni obbligatorie*, CO) from 2014 to June 2019 (the last date in which the data were available). The goal is to estimate the job mobility of workers before the COVID-19 crisis to get insights on their potential for reallocation to other sectors.

By studying the career of the workers with experiences in accommodation and food service activities, we find that they are less likely to be employed after 6 months with respect to the average private service workers (-8 percentage points), due to the seasonality of both labour demand and supply. The negative gap reduces to zero after three years. Conditionally on being employed, these workers show limited sectoral and occupational transitions. Workers with experiences in sport and entertainment activities have an even lower probability of being employed, both in the short (-11.7 percentage points after 6 months) and in the medium run (-5 percentage points after 3 years) compared to employees in other private services. However, these workers have a higher probability of changing industry and occupation conditional on finding a job, compared to other non-financial private services.

Digging deeper into the mechanisms, we find that supply determinants seem not to be the main explanatory factors for labour mobility across sectors and occupations before 2020. Instead, qualitative analyses on skills requirements on the job show that the accommodation and food service sector, where reallocation is less common, demands a relatively lower level of basic and social skills with respect to other private services; the recreational sector, from which reallocation is more likely, requires similar level of skills to those of the other services. We further show that the similarity in skills requirements is positively correlated with job-to-job flows. Note that, however, our analysis is only suggestive as our setting does not allow us to fully account for selection biases (that may well be different for hospitality/food and sport/entertainment workers) nor for labour demand fluctuations in the period analysed.

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[3] Italian Labor Force Survey 2019, Istat. In this paper, unless specified otherwise, we consider one-digit occupation groups aggregated into three broad categories: low-qualification occupations include service workers and shop and market sales workers, and elementary occupations; middle-qualification occupations include clerks, craft and related trades workers, and plant and machine operators and assemblers; high-qualification occupations include managers, professionals, and technicians and associate professionals (OECD Employment Outlook, 2017).

Our results are in line with the literature that suggests a prominent role for general and occupational-specific skills in determining job mobility (Poletaev and Robinson, 2008; Gathmann and Schönberg, 2010). Based on these results, we perform a simple counterfactual exercise to quantify the labour reallocation in case of no labour demand in the tourism-related sectors and in the recreational sectors: we find that job flows would be redirected mainly towards other services (administrative support to firms, retail and wholesale trade) and manufacturing. Overall, the evidence suggests that absent a strong labour demand in hospitality or recreational services, these workers would be favoured in terms of reallocation to other sectors in which they can perform tasks similar to those in their previous job. However, as other service sectors are also experiencing a drop in demand, the reallocation potential remains limited.

By relying on the universe of administrative records of Italian job transitions, our main contribution is that of describing labour reallocation before the pandemics and quantifying one possible scenario. This analysis is particularly relevant in Italy where the accommodation and food service and recreational sectors, despite being relatively small (representing 7 percent of total employment in 2019), explained up to one fifth of the employment growth between 2013 and 2019 (Petrella and Torrini, 2019).

However, we have to bear in mind the limitations imposed by the context of the analysis and by the data. First, while informing about job-to-job moves in the pre-Covid period the results cannot be extrapolated to the pandemic and post-pandemic period as they stand. We must consider that the public health and the economic crises will likely lead to behavioural responses in labour supply by workers and in the composition of the labour demand by firms that we are not able to see with currently available data and are not the object of our analysis. Second, we do not deepen into all the determinants of job moves as our main contribution is to quantify job transitions for tourism-related and recreational workers in the pre-pandemic period to get insights about the extent labour reallocation.[4]

The rest of the paper is structured as follows. Section 2 describes the data and show the main descriptive statistics. Section 3 lays out the empirical strategy and discusses the main results on employment transitions. Section 4 presents evidence on qualification levels, skills demand and the potential reallocation of workers in hardly-hit sectors. Section 5 concludes.

2. Data and descriptive statistics

Our empirical strategy draws upon the *Comunicazioni obbligatorie* (CO) data that collects administrative reports for all Italian workers at the contract level at the time of hiring and contract termination. We consider job relationships active from January 1, 2014, to June 30, 2019 (the last date in which the data were available) with a focus on the accommodation and

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[4] For a recent analysis of Italian and French job-to-job transitions with respect to wage dynamics, see Berson et al. (2020).

food services and on the sport and entertainment sectors.[5] To compare workers with similar contracts and employment trajectories, and who face similar labour demand conditions, as a comparison group we consider non-financial private services.[6] From the raw data, which record each hiring and contract termination event, we construct a panel of workers that we follow over time, recording as employed the workers whose job has not been terminated in a given month (or who transitioned to another job) and as non-employed those whose job was terminated and are not employed in a new job yet. We track for each worker in each month her employment status, sector, occupation and region of work; when an individual has more than one contract active in the same month, we select the contract with the longest spell.

Table 1 shows the main descriptive statistics. Looking at single job spells, accommodation, food service and recreational sectors workers have much more fragmented careers than other service workers do: they signed 2.8 contracts on average over the period of analysis, versus 2.2 in other non-financial private services. Such pattern may be due to both a high turnover and high seasonality in these industries. Moreover, the length of job spells was below 3 months in 38 (47) percent of cases for the hospitality (recreational) sector and below 6 months in 67 (72) percent of them. The same shares were equal to 33 and 50 percent, respectively, in the other sectors. Such seasonal patterns also emerge in longer non-employment spells on average; however, the long-term non-employment spells (beyond 12 months) are less frequent for these workers with respect to workers in other services. Finally, job activations in accommodation and food service are more frequent among low-qualification occupations (90 percent of contracts); such proportion is about half (46 percent) for new hires in the recreational sector (in the rest of non-financial private services the share is 56 percent).[7]

The data register both the unique, anonymized, firm identifiers as well as their location. From this piece of information, we know that workers with a job experience in the accommodation and food service sectors respond to seasonal employment opportunities by being more mobile both across employers and across geographical areas. Indeed, in the period 2014-2019, about half of them worked for different employers (against about 43.5 percent on average in other non-financial private services) and 10.7 percent changed region of work (8.9 for the other sectors). Among those who moved, 41 percent did it over a long-range (between South and Centre-North), against just 35 percent in other non-financial private services. Employees in the recreational sector experienced a higher geographic mobility, but a lower number of employers.

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[5] These sectors correspond to Sections I and R in both the Italian ATECO and in the international NACE rev. 2 classifications. The full CO dataset comprises about 50 millions job spells in the period 2014 - mid-2019. The analysis was run on a random sample to handle a more manageable dataset. In particular, we selected individuals born on the third and the fifth day of each week (about 29 percent of the universe).

[6] Non-financial private services represent about half of the overall contracts activated in the considered period.

[7] The differences between the stock of low-qualification occupations, reported in the Introduction, and the new hires, on which these numbers are calculated, indicate that the incidence of these low-skill jobs is increasing over-time in both sectors (note that recreational sector workers often have tertiary and specialization degrees such as art performers, sport and art teachers and sport professionals and trainers). The low-, middle- and high-qualification occupation categories are defined according to footnote 3.

3. Employment transitions

3.1. Empirical strategy

One of the main advantages of the CO dataset is that we can track the individual careers of all workers after hiring. Thus, in this section, we study in depth the transition probabilities between employment and non-employment, and across sectors, occupations and regions over a span of 3 years to gauge insights about the reallocation potential of workers who operate in the accommodation and food service and recreational sectors.

Exploiting the panel-month structure of the dataset, our analysis is based on the following model:

$$Y_{it} = \alpha + \beta Z_{i,t-k} + \delta X_{i,t-k} + \gamma W_i + \varphi_t + \varepsilon_{it} \tag{1}$$

where Y_{it} is a dummy identifying the employment outcome of individual i at time t (month-year). We consider different outcomes in different specifications: in particular, Y_{it} is either being employed, or – conditional on being employed – working in a different sector, occupation or region with respect to k months before, where k=6, 12, 24 and 36. We therefore estimate four regressions, one for each k. $Z_{i,t-k}$ is the main variable of interest: a dummy equal to 1 if individual i was employed alternatively in the food and accommodation or in the recreational sectors k months before, 0 if she was employed in other non-financial private services. $X_{i,t-k}$ are time-varying individual and job characteristics at time t–k (education, age and age square, occupation and geographic area of work, i.e. South or Centre-North), and W_i are time-invariant individual characteristics (gender, nationality). We also include month-year fixed effects (φ_t) to capture common trends.

We choose to limit our sample to workers employed in non-financial private sectors at time t–k in order to compare workers starting from similar conditions to those in the hospitality and recreational industries. The sectors of destination, however, comprise the entire economy, including the public sector. Therefore, our analysis aims at identifying the differential effect on employment transitions of workers operating in these sectors from those of workers in other non-financial private service activities[8].

As a further check, we also run the regressions including individual fixed effects: such specification has the advantage of accounting for time-invariant unobservable characteristics,

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[8] Note that we consider one sector at a time, alternatively hospitality or recreational, to make a clear comparison between either sectors and the rest of private non-financial services. We therefore exclude from the analysis the recreational sector when focusing on those working in t–k in the accommodation and food service activities, and the other way around.

but it has the disadvantage of limiting the identification of βs out of individuals who switch in and out the hospitality/recreational sector at least once in the considered period.

Table 2 reports the mean values of the dependent variables described in equation (1) and the mean differences between the groups (at k=36). Considering all workers in non-financial private services, the probability that somebody who was employed three years ago is also working today is 73.4 percent. Conditional on being employed, the shares of individuals that change either sector or occupation with respect to three years before are 15.4 and 14.7 percent, respectively. Finally, 4.9 percent of workers change region of work on average. Workers in accommodation and food service activities show similar patterns with respect to other private service workers: the probability of being employed after 3 years from the original job spell is only slightly lower, and so are sectoral and occupational transitions. Workers in the recreational industry are less likely to be employed than the average, but, conditional on having found a job, they show a higher sectoral, occupational and regional mobility.

3.2. Baseline results

Accommodation and food service workers

We start our analysis by documenting job mobility of workers in accommodation and food service activities. The first step is to test whether these workers are more or less likely to remain employed in the short and medium run (Table 3, panel A). The results on the transitions between employment and non-employment reflect the seasonal nature of these jobs: after six months from when workers are observed in accommodation and food service sectors, they have an 8 percentage points lower probability of working compared to employees in other non-financial private services. Such negative gap declines as we observe them one or two years after, thus implicitly controlling for seasonal effects (-1.9 and -0.9 percentage points respectively) and it vanishes to zero after three years. These results indicate that, despite the seasonality of these jobs in the short run, workers in the accommodation and food service activities have the same employment opportunities as the average private service workers in the medium run. Robustness checks where we limit the analysis to a balanced sample and to prime-age males, whose labour market participation is extremely high, indicate that compositional and supply effects are not the main cause of such empirical patterns (see section 3.4 for details).

The potential for reallocation of hospitality workers is a key issue in analysing their employability after the COVID-19 crisis. We then estimate equation (1) with, as dependent variable, a dummy equal to one if the individual is in a different sector with respect to k months before conditional on being employed. Results in Table 3, panel B, show that the moves to different sectors over time are not common: the estimated coefficient after 3 years is -0.004, corresponding to about 3 percent of the average value of the dependent variable (0.154).

To refine our analysis, we assess whether also transitions to different occupations are more or less frequent for workers who have been employed in the accommodation and food service activities. We thus construct as outcome variable a dummy for being employed in a different occupation. Similar to the ILO's ISCO-08 international classification, the Italian occupation

classification present in the CO data (CP2011) groups jobs according to the tasks and duties undertaken up to a detailed level (about 800 occupations at the fifth digit level). To study cross-occupation transitions, we limit the analysis to the broadest groups, i.e. nine categories: these may occur either within the origin sector or across sectors, but necessarily imply that a worker changes the tasks she performs as the skills required on the job differ. Conditionally on being employed, workers with experiences in the accommodation and food service sectors have a 0.8 percentage point higher probability of working in a different occupation in the very short run with respect to other services employees. The magnitude of the coefficient is relevant, as it corresponds to 27 percent of the average value of the dependent variable (that is 2.9 percent; Table 3, panel B). The effect reduces in the medium-run: after 3 years, the estimated coefficient is 0.006 (4 percent of the average probability). The analysis on skills in Section 4 will also clarify what type of skills are required in all occupations and sectors to understand better what drives the job moves.

We also find that accommodation and food service workers have a higher geographical mobility in the short run compared to employees in other non-financial private services; this mobility is likely determined by the seasonality of the job, as it declines in the medium run (Table 3, panel B).

Recreational sector workers

We then explore the same outcomes for workers operating in the sport and entertainment sector. In line with accommodation and food service activities, recreational workers are less likely to be employed after 6 months due to the seasonal nature of these jobs (-11.7 percentage points; Table 4, panel A). While for the accommodation and food sectors workers the gap reduces over time, recreational workers have a constant 5 percentage points lower probability of being employed than other service workers constant across time (i.e., one, two and three years after a job spell in sports and entertainment). Conditional on having found a job, individuals with past experiences in the recreational industry show a higher sectoral, occupational and regional mobility. The probability of observing these employees in a different sector over time is higher than the average of non-financial private services (Table 4, panel B): 2 percentage points after 6 months (69 percent of the average value of the dependent variable) and 5 percentage points after 36 months (33 percent of the average value of the dependent variable). As regards the probability of changing occupation, the coefficients are 0.012 and 0.010 after 6 and 36 months, respectively, representing 41 and 7 percent of the average probability. Finally, recreational workers are also more likely to change region of work with respect to other service employees.

3.3. Heterogeneity across workers

By simply looking at average effects, the estimation framework of equation (1) might not detect possible heterogeneous effects among individuals with different characteristics. The Italian labour market is characterized by a high North-South divide, as well as gender and generation gaps (Rosolia and Torrini, 2016; Del Bono and Vuri, 2011; Cannari et al., 2000). We therefore interact dummies for accommodation and food and for recreational sectors with dummies capturing the region of work, gender and age. We focus on employment transitions after 3 years.

First, we assess whether there are geographic differences. The coefficient on the interaction term reveals that individuals who were working in the South have lower employment probabilities than in the rest of the country (Table 5, column 1): this result implies that the null effect on medium term employability for hospitality sectors is an average of Northern and Southern employment to non-employment transitions. Conditional on being employed, Southern workers have a higher sectoral, occupational and regional mobility (Table 5, columns 2-4).

Second, we explore gender heterogeneity. Females are more likely to be employed than males in the medium run, they are more likely to change sector and occupation, but they have a lower geographic mobility. One possible mechanism for higher female employability could be due to a selection effect, as those women already employed tend to keep their job and transit across sectors and occupations more often. However, domestic and childcare responsibilities can cause employed women to limit their propensity to move to a different region for a new job.

Third, we interact sectoral dummies with the dummy for individuals under the age of 35. Results suggest the probability of being employed does not vary according to the age of workers in both the hospitality and the recreational sector (Table 5, column 1). Conditional on having found a job, youths with experiences in the accommodation and food service activities are more likely to stay in the same sector and with the same occupation, while young recreational workers experience higher sectoral and occupational transitions with respect to workers over 35 years of age. Finally, youths are more likely to change working region.

3.4. Robustness checks

We present several checks to confirm the robustness of our analysis. First, there may be compositional bias because regressions for different lags (k) are estimated on different samples. In order to deal with this issue, we run the analysis on the minimum subsample of individuals who are always present in all models with different ks. Results, shown in Table A.1, are robust to this alternative sample.

Second, we provide estimates for prime-age males (ages 25 to 55) to limit possible bias arising from self-selection in the labour market participation and to test whether results are robust when excluding marginally attached workers.[9] The estimates are confirmed for the recreational sector; males in the hospitality sector have instead a lower probability of being employed with respect to other male workers in non-financial private services (Table A.2).

We perform a further robustness check by including individual fixed effects. Results, reported in the Table A.3, confirm the baseline findings for the probability of being employed in the very short run: after six months from when individuals are observed working in accommodation and food service or recreational sectors, they have a lower probability of working compared to employees in other non-financial private services. However, this negative gap turns positive,

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[9] As a further check, we estimate the main regressions only on a sample of individuals who are not eligible for early retirement, i.e. 59 years old or younger. The coefficients, not reported, but available upon request, remain unchanged with respect to those reported in Tables 3 and 4.

even though small in magnitude, when we observe the workers after one, two and three years. As noted in Section 3.1, while this specification allows us to capture time invariant unobservable individual characteristics, it has the drawback of estimating β using only individuals who transit in and out the accommodation and food service/recreational sector at least once in the considered period. To better compare the two models, we therefore run the regressions without individual fixed effects on the sample of workers who switch sectors at least once. Although the results, reported in Table A.4, are not identical to the baseline, they confirm the negative effects on the probability of being employed for the sectors considered in the analysis. Thus, these sets of regressions indicate that unobserved heterogeneity explains a great deal of the positive re-employability effect observed in the medium run in Table A.3.

3.5 An interpretation of the mechanism at play

Our findings on seasonal job transitions, stronger attachment in the hospitality and food sectors and greater sectoral and occupational reallocation of recreational sector workers, discussed in the previous Sections, can be explained by several factors related to both demand and supply forces. Unfortunately, our data and setting do not allow to fully distinguishing these mechanisms. Yet, several indications tend to exclude supply forces as the main determinants for such transitions. On the one hand, marginally attached workers in the accommodation and food services could have been willing to accept temporary jobs in these sectors where seasonal contracts are widespread. On the other hand, however, the stronger probability of employment in the medium run of females (shown in Section 3.3) and results based on prime-age males (whose labour market participation is very high in Italy, see Section 3.4) tend to exclude this channel.

While we cannot exclude that the significant growth of tourism demand in the period analyzed hindered sectoral reallocation away from tourism-related activities, a human capital mechanism could be at play (Poletaev and Robinson, 2008; Gathmann and Schönberg, 2010).[10] Workers operating in hospitality and food service occupations, who are often low skilled, are employed in occupations that entail simple manual-intensive tasks. Therefore, they are less likely to develop more advanced skills and to acquire human capital that could be required in other sectors limiting the scope of their job transitions. Note that such a human capital effect could be at play since the entry in the labour market: unobserved heterogeneity may determine the sorting of less-skilled workers into the hospitality and food service sectors; on the contrary, recreational sectors workers might be better selected as documented also by their observable characteristics.

To test further this hypothesis, in the next section we analyse the competences required in these sectors and compare them to those demanded in other activities. As a preview, we show that

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[10] Gathmann and Schönberg (2010) use the concept of tasks-specific human capital (following Gibbons and Waldman; 2004, 2006) to study occupational mobility and wage growth. They provide evidence that individuals move to occupations having skill requirements similar to those of their previous occupation. Poletaev and Robinson (2008) rank jobs according to basic skill types and levels, and construct measures of the closeness of jobs in terms of the underlying tasks and skill levels of the jobs. They show that much of the mobility appears to be across quite similar jobs.

occupations in the accommodation and food services tend to have less skill requirement than other service sectors. These findings, though qualitative and suggestive, indicate that the lack of on-the-job accumulation of human capital could be at play for these workers. Consistent with a major role for human capital, we find that, on the contrary, the higher sectoral and occupational mobility of recreational sector workers could be explained by the higher level of education and more similar skills requirement to other service sectors; both factors facilitate job transitions. Our result may be biased as we are focusing on those who remain employed and who might be positively selected.

4. Qualification levels, skill demand across sectors and labour reallocation

4.1. Skill demand across sectors

To validate the human capital channel put forward in the previous section, and understand the role played by skill demand in shaping job transitions, we analyse here the competences required in these hardly-hit sectors and compare them to those demanded in other services.

Workers in the accommodation and food services usually perform tasks that require some manual dexterity and social and interpersonal skills, but very little technical skills. The education level of workers, reported in the Italian Labor Force Survey (LFS), provides a first insight in this sense. In 2019, workers in the hospitality sector had on average 11 years of schooling (12.3 in the rest of the economy), and only 8 percent had a university degree, or higher, compared to 22 percent in the rest of the economy. Employees in the recreational sectors have a higher average level of education (13 years of schooling) and are more likely to have a tertiary or specialization degree (28 percent; e.g., in Fine Arts), which may help them in the cross-occupations and cross-sectoral job transitions.

However, the education level is not fully informative in terms of technical and social skills developed in, and required by, an occupation or sector. To analyse the skills demanded in each occupation we turn to the Italian Sample Survey on Professions (ICP).[11] ICP is a survey last run in 2013 by National Institute for Public Policies Analysis (Inapp) of about 16.000 workers in around 800 occupations, according to the 5-digit CP2011 classification (the Italian equivalent of the ISCO-08 ILO's classification). The ICP asks to each worker the tasks performed on the job as well as the skills required through a particularly rich and articulated questionnaire.[12] For our purposes, we use the information on the level of skills demanded and the frequency of their use in 35 types of procedures and cognitive processes; these, in turn, determine the ability to accomplish the tasks required in each of the 800 Italian occupations. Even though the skills are generic and basic in nature, there is variation across sectors determined by different requirements and intensity of use across occupations. Examples of skills are text

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[11] The survey is the Italian equivalent of the US Occupational Information Network (O*Net) run by the US Department of Labor.

[12] The ICP directly asks workers to answer the questionnaire, rather than experts, to focus on the point of view of those who exercise daily occupational activities under consideration and have a direct and concrete assessment of the level of use of certain characteristics essential to carry out one's job.

comprehension, communicating effectively, using math to solve problems, process monitoring, complex problem solving, and time and resource management.

We summarize the information on the 35 skills surveyed in ICP by constructing for each sector s an indicator of the required level of skill j, $C(j)_s$ (for each j=1,…,35).[13] Such variable indicates how much a sector s demands, on average, more of a skill j with respect to other sectors. In this sense, these indicators provide only qualitative information about skills requested on the job, and the relative amount with respect to those used in other jobs. Nevertheless, this piece of information is relevant to understand whether workers with experience in certain sectors have more chances to find jobs in other sectors because of the similarity with the skills that were required during their previous working experience.[14]

Figure 1 reports the average $C(j)_s$ for accommodation and food service activities, and sport and entertainment expressed in standard deviation with respect to the average of non-financial private services. As the figure shows, the entertainment sector generally requires more of basic and social competences compared to the average non-financial private services: in particular, it requires more ability in learning strategies, social perception and coordination, and teaching. On the other hand, the accommodation and food service sector requires on average lower level of competences than other service sectors, except for the relative demand of certain social (willingness to serve), technical (quality control), and management skills (material resource management).

The descriptive evidence presented so far about education levels and skill requirement points to a mechanism in which workers who gained experience in the recreational sector not only have a higher level of education, but are also employed in occupations that require a relatively higher level of basic and social skills. Both factors may help them in reallocating more easily in a different sector and occupation conditional on finding a new job.

4.2. A reallocation scenario based on skill demand

We study the role of skills and competences in determining the direction of labour reallocation. First, we calculate how job flows across all sectors and occupations depend on the distance in skill requirements. Such exercise is motivated by the strong role that skill demand is likely to play in explaining job-to-job transitions (section 4.1) and the limited one played by supply factors (sections 3.2-3.4).[15] Then, to get insights about the patterns of labour reallocation we

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[13] More precisely, for each occupation p and skill j (j=1,…, 35) the required level is weighted by the relative intensity of that skill with respect to other required skills in p: $C(j)_p = skill(j)_p * w(j)$, where the weight is given by $w(j) = \frac{intensity(j)}{\sum_{i=1,…,35} intensity(i)}$. Therefore, by averaging across occupations within sectors, we calculate for every industry s the average level of skill, $C(j)_s$. For instance, the average text comprehension of sector s is the average of $C(text\ comprehension)_p$ for each occupation p using as weights the occupational employment shares. That is: $C(j)_s = \sum_p C(j)_p * \frac{employed_{ps}}{employed_s}$.

[14] Differently from Gathmann and Schönberg (2010), the data we are using for Italy do not allow to measure wages nor to observe the full experience profile of workers.

[15] As already pointed out, the tourism boom experienced in these years was an important determinant of labour reallocation. However, in this section we ignore this factor as a determinant of labour reallocation as we shut down

perform a simple counterfactual exercise. We shut down job flows towards the food and accommodation and the recreational sectors and quantify where these jobs would have gone based solely on our model (keeping fixed all other labour market conditions). Such simple exercise, which does not account for general equilibrium effects (and keeps fixed the labour demand in other sectors), is not meant to provide an undisputed quantification of labour reallocation during and after the pandemics, but to provide a simple qualification of the extent and direction of possible labour flows.

Following Gathmann and Schönberg (2010), we construct a measure of the distance in skill requirements between two occupations, p and p' as follows:

$$Similarity_{pp'} = \frac{\sum_{j=1,..,35} C(j)_p * C(j)_{p'}}{\left(\sum_{j=1,..,35} C(j)_p^2 * \sum_{j=1,..,35} C(j)_{p'}^2\right)^{1/2}}$$

As shown in their paper, $Similarity_{pp'}$ captures the distance between two occupations measured as the cosine angle in the vector space defined by the skill demanded in p and p'. Such distance is equal to zero if two occupations require completely different skills and one if the skills are identical. Differently from Gathmann and Schönberg, we construct our measure with the 35 skills measured by ICP rather than with the 19 task measures observed in the German Qualification and Career Survey. Our $Similarity$ variable has relatively little variation (the average value is 0.89 with a standard deviation of 0.07) possibly because of the definition and measurement of skill requirements in the ICP survey (e.g., all occupations report at least some use of each of the 35 skills).

To relate skill demand to actual job flows across sectors and occupations we estimate the following model:

$$lnF_{sp\ s'p'\ t} = \alpha + \beta lnSimilarity_{pp'} + \gamma \ln L_{spt} + \delta \ln L_{s'p't} + \theta_{sp} + \theta_{s'p'} + \theta_t + \varepsilon_{sp\ s'p'\ t}$$
$$(2)$$

where $lnF_{sp\ s'p'\ t}$ is the log of job flows between any two sector-occupation pairs sp and $s'p'$ at time t, calculated from the CO data.[16] We control for employment size of the sector-occupation of origin and of destination (calculated from LFS), and we include origin and destination sector-occupation and year fixed effects ($\theta_{sp}, \theta_{s'p'}, \theta_t$). The intuition is that of a gravity equation when estimating bilateral trade flows, as flows are explained by the size of the origin and destination economy as well as by a function of the distance between the two areas, here represented by the similarity in skill requirements.

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on purpose tourism-related labour demand. Unfortunately, we are not able to account for general equilibrium effects in other sectors that indeed determine overall labour allocation.

[16] We consider job-to-job transitions within three months from the end of the previous job. The sample period of estimation is 2015-2018. As a robustness check, not shown but available upon request, we also estimate a weighted regression where the weight is the employment size of the sector-occupation of origin. Results are robust to such specification.

Table A5 reports the results of the regression (2). Estimates suggest that similarity in skills requirements influences the direction of occupational mobility: unsurprisingly, workers are more likely to move to occupations with similar skills. Most importantly, such model allows us to perform the very simple counterfactual exercise previewed above: we estimate how job flows would have changed absent labour demand in hospitality and recreational activities. Once we set to zero job flows toward the hospitality and the recreational sectors, respectively, we quantify where jobs would have flowed keeping all other labour market conditions constant. Figure 2 reports actual, predicted and counterfactual job flows by sector of destination, expressed as percentage of total flows from accommodation and food services (panel A) and from the recreational sector (panel B). Looking at actual flows, as suggested in Tables 3-4, within sector transitions are higher in accommodation and food services (about one third) than in recreational activities (about one fifth). As regards cross-sector transitions, workers in hospitality tend to move towards many different sectors: wholesale and retail trade, administrative and support service activities, agriculture and manufacturing. Flows from the recreational sector are way less differentiated despite being more common: workers tend to leave the recreational sector mainly towards accommodation and food service activities, followed by wholesale and retail trade and administrative and support service activities (Figure 2).

Figure 3 shows in more the details the difference between predicted and counterfactual shares of job flows. In a hypothetical framework with no labour demand in the hospitality and recreational sectors, our model suggests that flows would be directed mainly towards administrative and support service activities, manufacturing, wholesale and retail trade, and, for recreational workers, other private services. However, the potential for reallocation could be limited further if the private service sector will experience a drop in demand.

5. Conclusions

Accommodation and food service and recreational activities workers will likely suffer long periods of unemployment if labour demand for these services will stay depressed due to the economic crisis triggered by the COVID-19 epidemic. These workers often have temporary contracts, irregular and fragmented careers, and short job spells. In the exceptional context of this emergency, non-conditional transfers disbursed by the Italian Government since the beginning of the pandemic crisis, have shielded workers in these sectors. In the longer run, it will be crucial for these workers to relocate into sectors that will experience positive labour demand shifts.

The evidence based on the analysis of pre-COVID-19 careers shows that workers in the two macro-sectors here considered behave differently in the labour market in the medium run. Those in the accommodation and food service activities are as likely to be employed in the medium run as much as the average service worker; conditional on being employed, sectoral and occupational moves are not common. Recreational sector workers were more likely to be non-employed in the medium run compared to workers in other non-financial private services.

However, if they remain employed they transit to other sectors. Note that the empirical setting, however, does not allow us to account for endogenous labour supply and positive selection into employment.

Our analyses also suggest that human capital and job-specific skills could be important determinants of workers' transitions. In particular, they could favour the cross-sectoral reallocation of workers with experiences in the recreational sector. Low-skill workers in the accommodation and food services sector may instead face higher barriers. Analyses on similarity in skill requirements suggest that job flows are more likely to occur towards occupations with similar set of tasks. Re-training programs will then be crucial to ease labour reallocation in the wake of the COVID-19 crisis and during the recovery.

Finally, we would like to caution that our paper is descriptive and the results only suggestive for the future trends in labour reallocation, as our setting does not account for the post-pandemic labour demand environment nor behavioural responses in labour supply. Further work is needed to directly study the reallocation paths of workers in the sectors worst hit by the economic crisis.

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Tables and Figures

Table 1. Descriptive statistics on job spells and workers (%)

		Accommodation and food service	Sport and entertainment	Other non-financial private services
Panel A: by contract				
contract length	<3 mths	37.5	47.3	32.6
	3-6 mths	29.6	25.0	17.9
	6-12 mths	17.0	15.9	14.6
	>12 mths	15.9	11.8	34.9
non-employment spell (1)	<3 mths	51.2	53.8	63.7
	3-6 mths	18.3	13.6	11.4
	6-12 mths	20.7	23.5	12.6
	>12 mths	9.9	9.2	12.3
type of profession (2)	low-skill	90.4	46.3	55.7
	med-skill	7.7	15.5	31.6
	high-skill	1.9	38.2	12.7
Observations		1,927,227	360,221	5,018,655
Panel B: by employee (3)				
N. contracts		2.8	2.8	2.2
N. employers	1	51.0	60.2	56.5
	2	23.7	23.0	25.2
	3-5	22.1	15.1	16.71
	>5	3.2	1.8	1.5
Change region		10.7	13.1	8.9
if change region: different macro area		41.1	39.1	35.3
Observations		699,101	125,388	2,246,801

Notes: The sample is made of workers born on Wednesdays and Fridays with an active contract in the period January 1, 2014-June 30, 2019. (1) We consider the average of non-employment spells that precede a contract in the considered sector. (2) We consider one-digit occupation groups aggregated into three broad categories: low-skill occupations include service workers and shop and market sales workers, and elementary occupations; middle-skill occupations include clerks, craft and related trades workers, and plant and machine operators and assemblers; high-skill occupations include managers, professionals, and technicians and associate professionals (OECD Employment Outlook, 2017). (3) "Accommodation and food service" and "Entertainment and sport activities" take value 1 for employees for which these sectors are the mode over the period considered or, in case of more than one mode, with the longest employment spell in these sectors.

Table 2. Descriptive statistics II – outcomes after three years (k=36)

	Means				Mean differences with respect to other non-financial private services	
	Accommodation and food service	Sport and entertainment	Other non-financial private services	All	Accom. and food	Sport and entert.
	(1)	(2)	(3)	(4)	(5)	(6)
Employed	0.7230	0.6911	0.7377	0.7339	-0.015***	-0.047***
					(0.000)	(0.000)
No. Obs.	7,668,331	1,329,191	36,642,400	45,639,922		
If employed:						
different sector	0.1485	0.2191	0.1528	0.1539	-0.004***	0.066***
					(0.000)	(0.000)
different occupation	0.1413	0.1739	0.1475	0.1472	-0.006***	0.026***
					(0.000)	(0.000)
different region	0.0491	0.0763	0.0476	0.0486	0.002***	0.029***
					(0.000)	(0.000)
No. Obs.	5,544,096	918,547	27,032,326	33,494,969		

Notes: The table reports the mean values for the dummy equals to one if the individual is, alternative, (i) employed, (ii) employed in a different sector, (iii) employed in a different occupation, (iv) employed in a different region, at month t for individuals working at month $t-k$ ($k=36$) in accommodation and food service activities or entertainment compared to individuals working in other non-financial private services. The sample is made of workers born on Wednesdays and Fridays with an active contract in the period January 1, 2014-June 30, 2019. In column (5) we exclude the sport and entertainment sector and in columns (6) we exclude the accommodation and food service sector. Robust standard errors in parenthesis. * p<0.05, ** p<0.01, *** p<0.001.

	Employed at			
	6 months	12 months	24 months	36 months
	(1)	(2)	(3)	(4)
Panel A: Unconditional estimates				
Prob. Employed	-0.080***	-0.019***	-0.009***	0.000
	(0.000)	(0.000)	(0.001)	(0.001)
adj. R^2	0.032	0.019	0.026	0.035
No. Obs.	93,980,364	83,475,689	63,267,370	44,220,358
No. Individuals	3,166,622	3,016,604	2,696,722	2,374,455
Dep. Var. Mean	0.873	0.842	0.780	0.734
Panel B: Conditional on being employed				
Different sector	0.003***	0.001***	-0.001***	-0.004***
	(0.000)	(0.000)	(0.000)	(0.001)
adj. R^2	0.006	0.010	0.018	0.024
Dep. Var. Mean	0.032	0.059	0.109	0.154
Different occupation	0.008***	0.011***	0.009***	0.006***
	(0.000)	(0.000)	(0.000)	(0.001)
adj. R^2	0.005	0.009	0.015	0.019
Dep. Var. Mean	0.029	0.056	0.104	0.147
Different region	0.006***	0.003***	0.004***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
adj. R^2	0.003	0.005	0.008	0.009
Dep. Var. Mean	0.012	0.021	0.036	0.049
No. Obs.	82,356,598	70,430,747	49,406,597	32,514,652
No. Individuals	2,690,251	2,484,083	2,075,459	1,779,266

Notes: The table reports the estimates from a linear probability model of being employed (panel a) and being employed in a different sector, occupation and region (panel b) at month t for individuals working at month $t - k$ ($k = 6, 12, 24, 36$) in accommodation and food service activities or in sport and entertainment compared to individuals working in other non-financial private services. When considering the dummy for accommodation and food service we exclude the sport and entertainment sector (and the other way around). The sample is made of workers born on Wednesdays and Fridays with an active contract in the period January 1, 2014-June 30, 2019. The model controls for individual characteristics (education, gender, nationality, age and age square), job characteristics (occupation and geographic area of work, i.e. South or Centre-North) and month-year fixed effects. Standard errors clustered at individual level in parenthesis. * p<0.05, ** p<0.01, *** p<0.001.

Table 4. Employment transitions – sport and entertainment

|	Employed at			
	6 months (1)	12 months (2)	24 months (3)	36 months (4)
Panel A: Unconditional estimates				
Prob. Employed	-0.117***	-0.053***	-0.055***	-0.052***
	(0.001)	(0.001)	(0.001)	(0.002)
adj. R^2	0.022	0.020	0.030	0.040
No. Obs.	79,379,587	70,723,014	53,941,648	37,881,664
No. Individuals	2,681,490	2,552,034	2,280,671	2,015,987
Dep. Var. Mean	0.873	0.842	0.780	0.734
Panel B: Conditional on being employed				
Different sector	0.022***	0.028***	0.040***	0.050***
	(0.000)	(0.001)	(0.001)	(0.001)
adj. R^2	0.007	0.012	0.020	0.026
Dep. Var. Mean	0.032	0.059	0.109	0.154
Different occupation	0.012***	0.012***	0.011***	0.010***
	(0.000)	(0.001)	(0.001)	(0.001)
adj. R^2	0.005	0.009	0.014	0.018
Dep. Var. Mean	0.029	0.056	0.104	0.147
Different region	0.013***	0.016***	0.021***	0.024***
	(0.000)	(0.000)	(0.001)	(0.001)
adj. R^2	0.004	0.006	0.009	0.011
Dep. Var. Mean	0.012	0.021	0.036	0.049
No. Obs.	70,676,081	60,073,401	42,302,754	27,889,482
No. Individuals	2,285,818	2,099,345	1,755,421	1,506,983

Notes: The table reports the estimates from a linear probability model of being employed (panel a) and being employed in a different sector, occupation and region (panel b) at month t for individuals working at month $t - k$ ($k = 6, 12, 24, 36$) in accommodation and food service activities or in sport and entertainment compared to individuals working in other non-financial private services. When considering the dummy for accommodation and food service we exclude the sport and entertainment sector (and the other way around). The sample is made of workers born on Wednesdays and Fridays with an active contract in the period January 1, 2014-June 30, 2019. The model controls for individual characteristics (education, gender, nationality, age and age square), job characteristics (occupation and geographic area of work, i.e. South or Centre-North) and month-year fixed effects. Standard errors clustered at individual level in parenthesis. * p<0.05, ** p<0.01, *** p<0.001.

Table 5. Employment transitions after three years (k=36), heterogeneity

| | Employed | Employed in | | |
| | | Different sector | Different occupation | Different region |
	(1)	(2)	(3)	(4)
Accommod. and food service	0.005***	-0.006***	0.004***	0.000
	(0.001)	(0.001)	(0.001)	(0.000)
x South	-0.020***	0.008***	0.008***	0.009***
	(0.002)	(0.001)	(0.001)	(0.001)
Sport and entertainment	-0.047***	0.038***	0.001	0.018***
	(0.002)	(0.002)	(0.002)	(0.001)
x South	-0.020***	0.052***	0.038***	0.026***
	(0.004)	(0.004)	(0.003)	(0.002)
Accommod. and food service	-0.007***	-0.029***	-0.006***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
x Female	0.014***	0.047***	0.023***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Sport and entertainment	-0.061***	0.032***	-0.006**	0.032***
	(0.002)	(0.002)	(0.002)	(0.002)
x Female	0.019***	0.039***	0.035***	-0.018***
	(0.003)	(0.003)	(0.003)	(0.002)
Accommod. and food service	-0.000	0.000	0.013***	0.001
	(0.001)	(0.001)	(0.001)	(0.000)
x Under35	-0.000	-0.010***	-0.017***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
Sport and entertainment	-0.052***	0.033***	-0.000	0.010***
	(0.002)	(0.002)	(0.002)	(0.001)
x Under35	-0.000	0.041***	0.025***	0.033***
	(0.003)	(0.003)	(0.003)	(0.002)
No. Obs. Accomm. and food	44,220,358		32,514,652	
No. Obs. Sport and entert.	37,881,664		27,889,482	

Notes: The table reports the estimates from a linear probability model of being employed (column 1) and being employed in a different sector (column 2), occupation (column 3) and region (column 4) at month t for individuals working at month $t-36$ in accommodation and food service activities or in sport and entertainment compared to individuals working in other non-financial private services. When considering the dummy for food and accommodation we exclude the sport and entertainment sector (and the other way around). The sample is made of workers born on Wednesdays and Fridays with an active contract in the period January 1, 2014-June 30, 2019. The model controls for individual characteristics (education, gender, nationality, age and age square), job characteristics (occupation and geographic area of work, i.e. South or Centre-North) and month-year fixed effects. Main effects are also included. Standard errors clustered at individual level in parenthesis. * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

Figure 1. Average competences required in accommodation and food service and recreational sectors compared to the average of non-financial private services
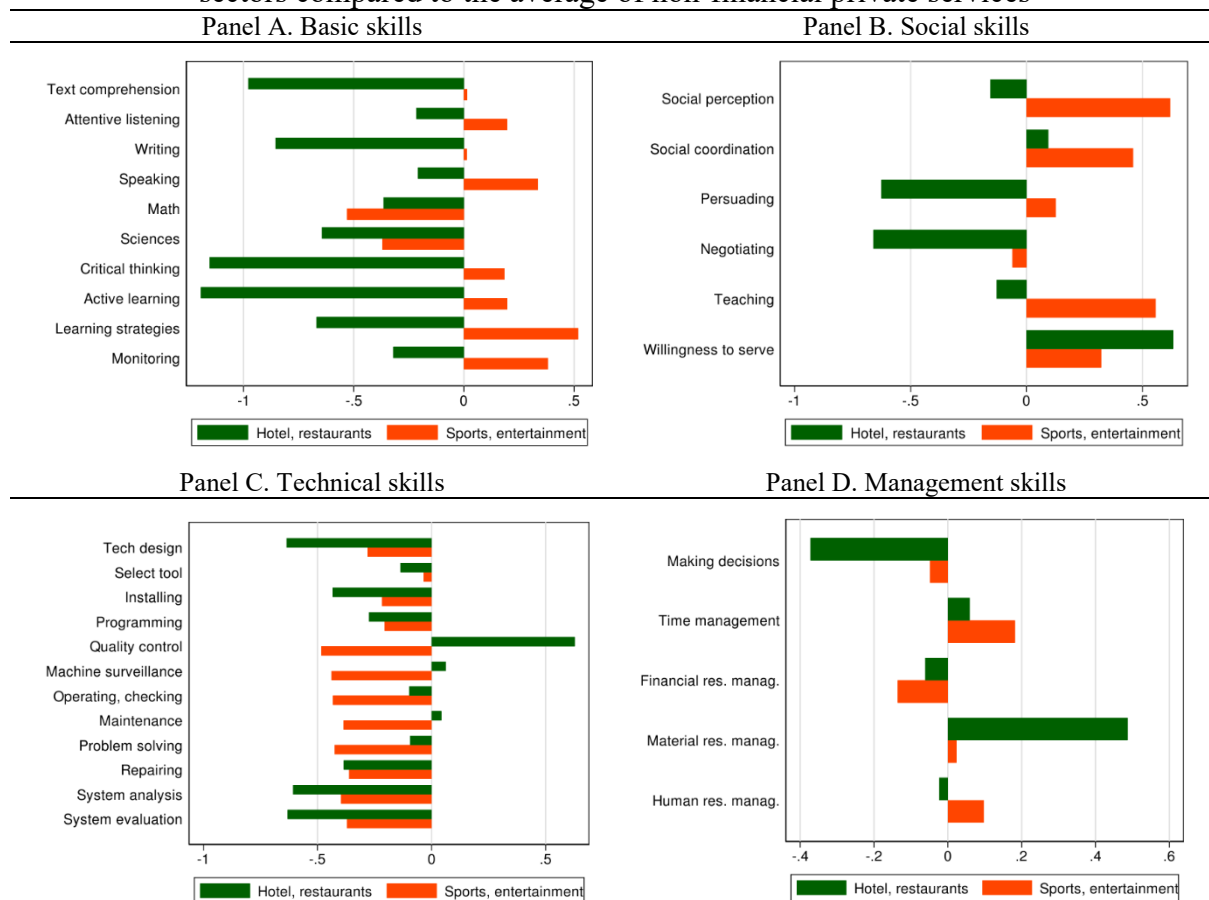

Note: The figure reports the average skills required in each sector as measured by the Italian sample survey on professions (ICP) and calculated as described in section 4. The unit of measure is standard deviation with respect to the average of non-financial private services.

Figure 2. Job-to-job flows

Panel A. Accommodation and food service activities	Panel B. Recreational activities
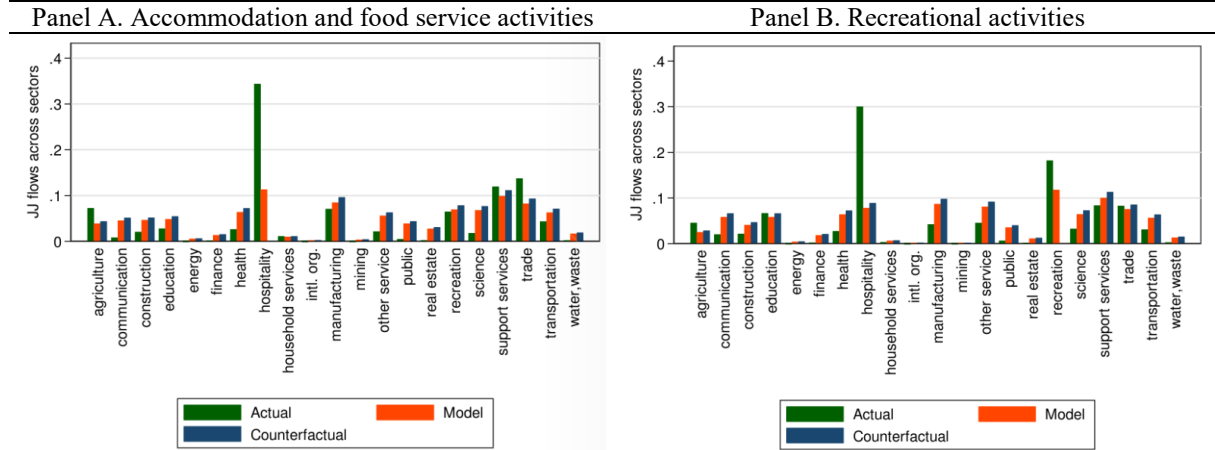
Notes: This figure reports job-to-job flows across sectors in 2018, as percentage of total flows from the hospitality sector (panel a) or from the recreational sector (panel b). "Model" represents job-to-job flows predicted from equation (2); "Counterfactual" represent job-to-job flows predicted from equation (2) shutting down to zero, alternatively, the flows to the hospitality (panel a) and to the recreational sector (panel b). The horizontal axis reports the sector of destination. We only consider job-to-job transitions within three months from the end of the previous job.

Figure 3. Job-to-job flows. Differences between counterfactual and predicted flows

Panel A. No accommodation and food service demand	Panel B. No recreational demand
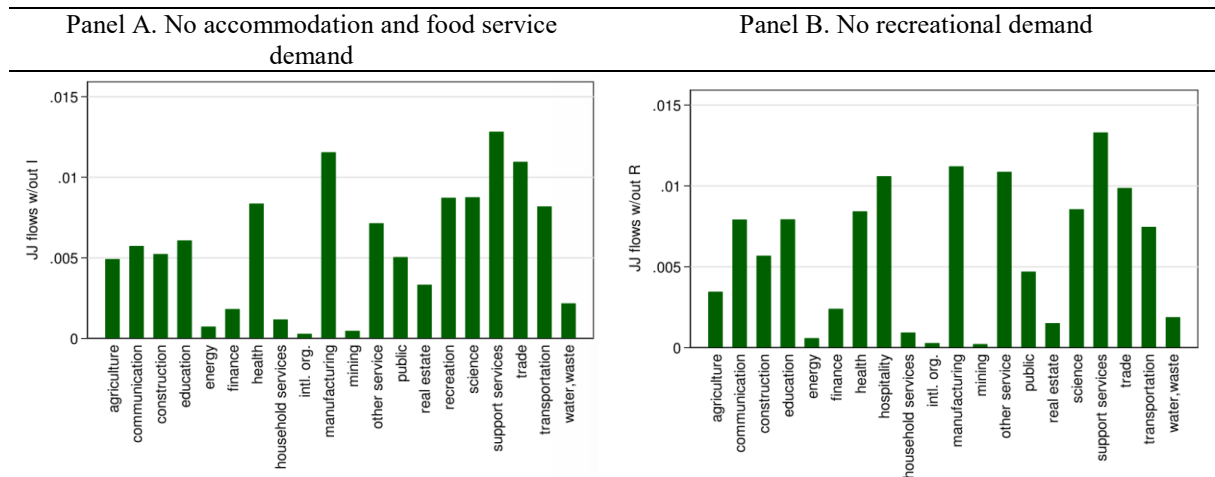
Notes: This figure reports the differences in the share of counterfactual and predicted flows in 2018, as percentage of total flows from the hospitality sector (panel a) or from the recreational sector (panel b). Predicted flows represent job flows predicted from equation (2); Counterfactual flows are calculated estimating equation (2) shutting down to zero, alternatively, the flows to the hospitality (panel a) and to the recreational sector (panel b). The horizontal axis reports the sector of destination. We only consider job-to-job transitions within three months from the end of the previous job.

Appendix. Additional results: heterogeneity analyses and robustness checks

Table A.1. Robustness check: probability of being employed over time keeping fixed the sample of individuals

	Employed at			
	6 months	12 months	24 months	36 months
	(1)	(2)	(3)	(4)
Accommodation	-0.078***	-0.016***	-0.008***	0.000
and food service	(0.000)	(0.000)	(0.001)	(0.001)
No. Individuals	2,374,455	2,374,455	2,374,455	2,374,455
Sport and	-0.106***	-0.047***	-0.052***	-0.052***
entertainment	(0.001)	(0.001)	(0.001)	(0.002)
No. Individuals	2,015,987	2,015,987	2,015,987	2,015,987

Notes: The table reports the estimates from a linear probability model of being employed at month t for individuals working at month $t - k$ ($k = 6, 12, 24, 36$) in food and accommodation services or entertainment compared to individuals working in other non-financial private services. When considering the dummy for food and accommodation we exclude the sport and entertainment sector (and the other way around). The sample is made of workers born on Wednesdays and Fridays with an active contract in the period January 1, 2014-June 30, 2019. The model controls for individual characteristics (education, gender, nationality, age and age square), job characteristics (occupation and geographic area of work, i.e. South or Centre-North) and month-year fixed effects. Standard errors clustered at individual level in parenthesis. * p<0.05, ** p<0.01, *** p<0.001.

Table A.2. Robustness check: probability of being employed over time on the sample of prime-age males (aged 25 to 55)

	Employed at			
	6 months	12 months	24 months	36 months
	(1)	(2)	(3)	(4)
Accommodation	-0.093***	-0.039***	-0.036***	-0.030***
and food service	(0.001)	(0.001)	(0.001)	(0.001)
Adj. R^2	0.031	0.013	0.014	0.013
No. Obs.	35,802,634	31,897,620	24,233,649	16,862,281
No. Individuals	1,205,236	1,158,141	1,047,023	926,944
Sport and	-0.122***	-0.064***	-0.074***	-0.077***
entertainment	(0.001)	(0.001)	(0.002)	(0.002)
Adj. R^2	0.018	0.011	0.013	0.013
No. Obs.	30,723,111	27,351,300	20,757,451	14,430,128
No. Individuals	1,040,449	995,655	893,767	788,462

Notes: The table reports the estimates from a linear probability model of being employed at month t for individuals working at month $t - k$ ($k = 6, 12, 24, 36$) in food and accommodation services or entertainment compared to individuals working in other non-financial private services. When considering the dummy for food and accommodation we exclude the sport and entertainment sector (and the other way around). The sample is made of workers born on Wednesdays and Fridays with an active contract in the period January 1, 2014-June 30, 2019. The model controls for individual characteristics (education, gender, nationality, age and age square), job characteristics (occupation and geographic area of work, i.e. South or Centre-North) and month-year fixed effects. Standard errors clustered at individual level in parenthesis. * p<0.05, ** p<0.01, *** p<0.001.

Table A.3. Robustness check: probability of being employed over time with individual fixed effects

	Employed at			
	6 months	12 months	24 months	36 months
	(1)	(2)	(3)	(4)
Accommodation and food service	-0.050***	0.004***	0.018***	0.016***
	(0.001)	(0.001)	(0.001)	(0.001)
adj. R^2	0.413	0.478	0.655	0.746
No. Obs.	93,885,112	83,368,738	63,166,062	44,132,291
No. Individuals	3,071,311	2,909,600	2,595,373	2,286,359
Sport and entertainment	-0.082***	0.006**	0.018***	0.015***
	(0.002)	(0.003)	(0.003)	(0.003)
adj. R^2	0.400	0.489	0.667	0.756
No. Obs.	79,290,775	70,627,186	53,853,831	37,805,647
No. Individuals	2,592,619	2,456,153	2,192,813	1,939,941
Individual FE	YES	YES	YES	YES
Month-year FE	YES	YES	YES	YES

Notes: The table reports the estimates from a linear probability model of being employed at month t for individuals working at month $t - k$ ($k = 6, 12, 24, 36$) in food and accommodation services or entertainment compared to individuals working in other non-financial private services. When considering the dummy for food and accommodation we exclude the sport and entertainment sector (and the other way around). The sample is made of workers born on Wednesdays and Fridays with an active contract in the period January 1, 2014-June 30, 2019. The model controls for individual characteristics (age and age square), job characteristics (occupation and geographic area of work, i.e. South or Centre-North), month-year and individual fixed effects. Standard errors clustered at individual level in parenthesis. * p<0.05, ** p<0.01, *** p<0.001.

Table A.4. Robustness check: probability of being employed over time – sample of individuals who transit in and out the accommodation and food service/recreational sector at least once in the considered period.

	Employed at			
	6 months	12 months	24 months	36 months
	(1)	(2)	(3)	(4)
Accommodation and food service	-0.033***	0.014***	-0.031***	-0.053***
	(0.001)	(0.001)	(0.001)	(0.002)
adj. R^2	0.062	0.015	0.030	0.033
No. Obs.	16,143,861	13,525,182	8,910,844	5,249,601
No. Individuals	749,901	690,261	558,357	423,692
Sport and entertainment	-0.059***	0.003	-0.050***	-0.072***
	(0.002)	(0.002)	(0.003)	(0.004)
adj. R^2	0.074	0.024	0.044	0.052
No. Obs.	2,780,134	2,332,643	1,553,336	939,503
No. Individuals	160,831	147,285	116,993	89,662

Notes: The table reports the estimates from a linear probability model of being employed at month t for individuals working at month $t - k$ ($k = 6, 12, 24, 36$) in food and accommodation services or entertainment compared to individuals working in other non-financial private services. When considering the dummy for food and accommodation we exclude the sport and entertainment sector (and the other way around). The sample is made of workers born on Wednesdays and Fridays with an active contract in the period January 1, 2014-June 30, 2019. The model controls for individual characteristics (education, gender, nationality, age and age square), job characteristics (occupation and geographic area of work, i.e. South or Centre-North) and month-year fixed effects. Standard errors clustered at individual level in parenthesis. * p<0.05, ** p<0.01, *** p<0.001.

Table A.5. Flows between sectors-occupations and similarity in skill requirements

| | Log(job flows) |
	(1)
Ln(Similarity$_{pp'}$)	5.400***
	(0.222)
Ln(L$_{spt}$)	0.009
	(0.011)
Ln(L$_{s'p't}$)	-0.005
	(0.006)
Year FE	yes
Occupation-sector origin FE	yes
Occupation-sector destination FE	yes
adj. R^2	0.422
No. Obs.	106.454

Notes: The table reports the estimates from a linear probability model where the dependent variable is the log of job-to-job flows between each pair sector/occupation in the period 2015-2018. Similarity$_{pp'}$ measures the distance between two occupations in terms of skills requirements. This measure varies between 0 and 1, with 1 means identical skills. L$_{spt}$ and L$_{s'p't}$ are employment in the sector-occupation of origin and of destination, respectively. We only consider job-to-job transitions within three months from the end of the previous job. Standard errors clustered at the sector/occupation of origin in parenthesis. * $p<0.05$, ** $p<0.01$, *** $p<0.001$.