

# VULNERABILITY TO COVID-19 UNEMPLOYMENT IN THE PORTUGUESE TOURISM AND HOSPITALITY INDUSTRY<sup>1</sup>

Ana Sofia Lopes<sup>a</sup>, Ana Sargento<sup>a</sup> and Pedro Carreira<sup>b</sup>

<sup>a</sup>*CARME – Centre of Applied Research in Management and Economics, ESTG, Polytechnic of Leiria  
(Portugal)*

<sup>b</sup>*ESTG, Polytechnic of Leiria (Portugal)*

## Abstract

**Purpose.** This paper seeks to address the immediate effects of the COVID-19 crisis in the Portuguese tourism and hospitality industry by examining whether some specific characteristics make people more vulnerable or more immune to unemployment.

**Methodology.** Using an extensive micro-level dataset of personal and job-related attributes containing all unemployed individuals in the Portuguese tourism and hospitality industry, a logit model with 56,142 observations is estimated to assess how each characteristic contributed to the unemployment odds during the COVID-19 crisis (until end-July 2020), relatively to the pre-COVID period.

**Findings.** The most vulnerable workers to COVID-19 unemployment seem to be older, less educated, less qualified, women and residents in regions with a higher concentration of people and tourism activity. Moreover, the COVID-19 crisis is generating a new type of unemployment by also affecting those who were never unemployed before, with more stable jobs and more motivated at work, while reducing voluntary disruptions.

**Implications.** Public effort should be made not only to increase workforce education but especially to reinforce job-specific skills. The COVID-19 crisis has broken traditional protective measures against

---

<sup>1</sup> Acknowledgements: the authors gratefully acknowledge the Portuguese Institute of Employment and Professional Training for the authorization to use their internal databases, which were essential for the investigation. This paper is financed by National Funds of the FCT– Portuguese Foundation for Science and Technology within the project «UIDB/04928/2020».

unemployment and separated workers from their desired occupations, which justifies new and exceptional job preservation measures. Policy recommendations are given aiming at strengthening worker resilience and industry competitiveness in the most affected sub-sectors and regions.

**Originality:** This study extends the current understanding of worker vulnerability to economic downturns. Herein, we used a three-level approach (combining socio-demographic, work-related and regional factors), capturing the immediate effects of the COVID-19 crisis and focusing on the tourism and hospitality industry (the hardest-hit sector worldwide).

**Keywords:** hospitality, tourism, COVID-19, job losses, vulnerability, Portugal, downturn effects.

**Article classification:** Research paper

## INTRODUCTION

The COVID-19 pandemic has had an unprecedented impact on human health and social and economic spheres. The most recent data from the World Health Organization reported almost 90 million confirmed cases worldwide (January, 2021), and the number of deaths is approaching the tragic threshold of two million (WHO, 2021). The economic effects of COVID-19 have been devastating globally, with World's GDP experiencing a nearly 3% decline (IMF, 2020). In Portugal, recent data from the Portuguese National Institute of Statistics (INE) showed the GDP decreased 5.7% (year-over-year variation, September 2020), and unemployment rose to 7.3% (in November 2020, 0.5 percentual points more than one year before) (INE, 2021).

The tourism and hospitality industry, with its dependence on both human mobility and close interpersonal contact between employees and clients, was one of the hardest-hit industries, both at the supply and demand sides (Huang et al., 2020; Jones and Comfort, 2020; Nicola et al., 2020). Data from December 2020 demonstrated a 72% year-over-year global decrease in international tourist arrivals, and the loss of this business puts about 120 million direct tourism jobs at risk (UNWTO, 2021). In Portugal's case, as the Europe's leading destination in the last four years (World Travel Awards), the tourism and hospitality industry makes a substantial contribution to the economy. Indeed, it is the most significant export economic activity in the country, accounting for around 20% of total

exports (52% of services exports), which corresponds to 8.7% of GDP in 2019 (Turismo de Portugal, 2019).

The COVID-19 has had a major impact on the Portuguese tourism and hospitality industry and the future remains uncertain. The effects were immediately visible after the first COVID-19 cases were detected in Europe and took a considerable downturn after implementing mitigation policies. The year-over-year variations from November 2020 (INE, 2020) are as high as -77% for tourists' overnight stays. Moreover, 46.4% of accommodation establishments reported being closed or with no guests at that time.

The present paper focuses on unemployment, as it remains an essential proxy for assessing the most immediate economic effects of a catastrophe on a given industry and it is one of the most important measures of competitiveness. While some of the support measures introduced by the Portuguese government were explicitly directed to the tourism and hospitality industry, we found that the number of registrations at the Portuguese Institute of Employment and Professional Training (IEFP) centres by unemployed individuals in this industry increased by 55.3% in July (considering a year-over-year comparison). This significant increase in unemployment in the tourism and hospitality industry far exceeds the overall economy, of 10.5%. Given the (present and expected) effect of this crisis on this industry's employment and the significant weight of the sector on employment in Portugal (over 20%, before COVID-19), this research was concerned with and focused on the potential impact within the tourism and hospitality workforce.

Extensive research on the impact of previous economic crises, particularly within the 2008-2013 Great Recession context, demonstrated a heterogeneous impact on the workforce, with some sub-groups being more vulnerable than others (Bachmann et al., 2015; Cho and Newhouse, 2013; Hoynes et al., 2012). Concerning the recent literature on COVID-19 and unemployment (e.g. Adams-Prassl et al., 2020; Couch et al., 2020; Fana et al., 2020; Kartseva and Kuznetsova, 2020; Sanchez et al., 2020), even though pointing that the tourism and hospitality industry is one of the hardest-hit, it provides essentially economy-wide, rather than industry-specific, results and reflections. Additionally, considering the disproportionate effect of this crisis on the tourism and hospitality industry, a study

focusing on COVID-19-specific job losses in this industry is paramount, especially for countries with high tourism activity, like Portugal.

Thus, we propose to study the immediate effects of the COVID-19 crisis on the composition of unemployment in the Portuguese tourism and hospitality industry, examining whether individuals' specific characteristics make them more vulnerable or more immune to unemployment. We utilised monthly Portuguese micro-level unemployment data, combined with some regional indicators, to compare the composition of unemployment in the tourism and hospitality industry during the COVID-19 period (from mid-March to end-July 2020) and the pre-crisis period.

This study is framed into the research strand dedicated to studying the vulnerability of different types of workers to economic downturns, adding three significant contributions. First, it captures the immediate effects of the COVID-19 crisis by using fresh monthly unemployment data. Second, it focuses specifically on the tourism and hospitality industry, which is currently the hardest-hit sector worldwide, considering the entire population of unemployed individuals with previous employment within this industry. Third, a three-level approach is used, combining the usual socio-demographic explanatory variables (age, gender and education) with work-related factors (type of previous contract, job-specific skills, previous subsector within the industry, voluntary/involuntary job disruption, and desired forthcoming occupation) and specific contextual indicators, such as the region the individual is located, that are expected to affect unemployment vulnerability in tourism and hospitality industry. This study provides valuable evidence to policy makers, and sheds light on the uneven impacts of COVID-19 on tourism and hospitality unemployment. Indeed, the information described herein could support the development of specific public policies, including protection systems and active labour market policies targeting vulnerable groups.

This study is organised into five sections, including the Introduction. In the second section, a brief overview of the literature is presented to help develop the specific research hypotheses. The third section focuses on the statistical model specification and identification of source data used. The results are presented and discussed in the fourth section. Finally, the conclusions are drawn in the final section.

## LITERATURE REVIEW

Soon after the start of the COVID-19 pandemic, some literature on its effects on the tourism and hospitality industry emerged. For example, Baum and Hai (2020) and Jiang and Wen (2020) describe how this industry was hit hard, resulting in significant revenue losses. Yacoub and ElHajjar (2021) and Lai and Wong (2020) identified strategic reactions used by hotels to control negative COVID-19-related effects and highlighted strategic approaches for adjusting to the post-COVID-19 reality. Moreover, Liu et al. (2021) and Jones and Comfort (2020) emphasise the essential role of government collaboration in these recovery and sustainable development strategies. While these studies reinforce resilience at the organisation (meso) level, studies focusing on the micro/individual level are scarce. Herein, we address vulnerability/resilience to COVID-19 at the individual level using multilevel variables to explain the unemployment trends during the crisis of people within the tourism and hospitality workforce.

Previous empirical studies confirm that the observed uneven impacts of recessions on unemployment are explained by personal (De la Rica and Rebollo-Sanz, 2017; García and Soest, 2017; Hoynes et al., 2012; Theodossiou and Zangelidis, 2009), job-related (Adams-Prassl et al., 2020; Fana et al., 2020; Doran and Fingleton, 2016; Bachmann et al., 2015; Baussola et al., 2015) and regional characteristics (Cappelli et al., 2020; Kartseva and Kuznetsova, 2020; Cho and Newhouse, 2013). Herein, we employed four multilevel determinants, gender, education and job-specific skills, regional context and work-contract. These determinants are expected to significantly impact the employment of workers' within the tourism and hospitality industry during the COVID-19 pandemic.

### *Gender*

Gender has received a great deal of attention as a potential segregation factor in the labour market. National governments and international organisations are dedicated to gender equality through commitments, including the Sustainable Development Goals. Goal 5 of this commitment seeks to achieve gender equality and empower all women and girls. Economy-wide studies have demonstrated that, despite a continuous convergence over the last years, female workers remain disadvantaged and face a higher unemployment rate than men (Baussola et al., 2015).

Shocks in economic activity and, thus, on employment may widen this gap. From a theoretical perspective, two main channels have been identified through which demographic characteristics can make some workers more vulnerable to unemployment during economic recession cycles. The first is occupational segregation (defined as a systematic distribution of people across occupations upon specific demographic characteristics, including gender). The second is the firms' perceptions (often stereotypes) on productivity regarding different demographic groups. Additionally, the idiosyncratic nature of the crisis and industry-specific labour market functioning and regulations may also exert notable bias on the distribution of the negative impacts among distinct groups (García and Soest, 2017; Cho and Newhouse, 2013).

Evidence from recent economic recessions has shown that unemployment rates increased more for men than for women, but this effect is influenced by the differences in the industry's gender composition (Albanesi and Sahin, 2018; Cho and Newhouse, 2013; Peiró et al., 2012). For example, in the previous 2008-2013 financial crisis, the gender unemployment gap was narrowed in some countries (De la Rica and Rebollo-Sanz, 2017; García and Soest, 2017; Şahin et al., 2010), including Portugal (Passinhas and Proença, 2020). This effect is mainly because the economic downturn affected more male workforce sectors, such as construction and finance.

In contrast, the worldwide tourism and hospitality industry is dominated by female workers (54%). Additionally, women are the majority of tourism workers in 69% of the countries included in the International Labour Organization's database (UNWTO, 2019). Therefore, it is reasonable to expect that the current crisis will expose more women to unemployment. This heightened vulnerability to COVID-19 unemployment experienced by women is further evidenced by the typical gender discrimination of tourism employees. For example, Alrwajfah et al. (2020), Hutchings et al. (2020), Santero-Sanchez et al. (2015) and Segovia-Perez et al. (2019) detected both horizontal and vertical gender segregation in tourism employment. Horizontal segregation is due to women performing more seasonal and precarious work, and vertical segregation reflects women's under-representation in high-wage management positions and high-skill jobs.

Interestingly, Alon et al. (2020) and Baum et al. (2020) found that social-distancing measures affect women more than men. This observation may be at least partially explained by school closures,

together with the (still) predominant role of women in childcare (Beqiri and Mazreku, 2020; Montenovo et al., 2020; Segovia-Perez et al., 2019).

Based on the results obtained from the literature review, we propose the following hypothesis:

*H1: In the Portuguese tourism and hospitality industry, women are more vulnerable to COVID-19 unemployment than men.*

### *Human capital*

Human capital theory, pioneered by Becker (1962), established that human capital investment makes individuals more capable of performing tasks and adjusting to changes and innovation, which is reflected in higher levels of labour productivity and makes highly skilled workers more valuable assets for employers. Accordingly, since part of this investment (particularly in job-specific knowledge) is supported by employers, highly skilled workers typically face a lower probability of experiencing unemployment (Mincer, 1991). Furthermore, these employees' layoff rates "fluctuate relatively less during business cycles" (Becker, 1962, p.23).

Literature related to the impact of human capital on job-stability during the Great Recession (e.g. García and Soest, 2017; Doran and Fingleton, 2016; Hoynes et al., 2012) confirmed that less-educated workers are more vulnerable to economic shocks and that the highly educated workers exhibit greater resilience due to an enhanced ability to adapt to changes in declining sectors to expanding ones and their increased learning abilities. In the Portuguese context, Passinhas and Proença (2020) stated that more educated workers were more protected from unemployment during a financial crisis.

Studies on the importance of human capital in worker resilience during the present COVID-19 crisis are naturally scarcer. Adams-Prassl et al. (2020) and Daly et al. (2020) have concluded that highly educated workers are more resilient because they are typically more willing to engage in telework and do not usually perform jobs requiring high interpersonal contact. At the same time, they can have a broader range of job possibilities, facilitating a direct transition from one job to another and avoiding unemployment (Montenovo et al., 2020). Also, Couch et al. (2020) claim that part of the higher vulnerability of minority groups to COVID-19 unemployment is explained by their lower education levels.

In all these studies, the human capital level is measured only by formal education. However, according to Becker (1962), acquiring job-specific knowledge/skills also contributes and is probably more effective at shielding the employee from the risk of job loss. Based on these observations, the second research hypothesis is as follows:

*H2: In the Portuguese tourism and hospitality industry, higher human capital levels, measured by formal education and job-specific skills, increase an individual's resilience to COVID-19 unemployment.*

#### *Regional context*

The regional context also impacts the economic resilience, in terms of output and employment, during recessions (Adams-Prassl et al., 2020; Cappelli et al., 2020; Fana et al., 2020; Kartseva and Kuznetsova, 2020; Sanchez et al., 2020; Doran and Fingleton, 2016). Doran and Fingleton (2016) state that regional asymmetries caused by economic shocks may be explained by economic models based on the wage curve and the Dixit–Stiglitz theory of imperfect competition. Moreover, Cappelli et al. (2020) concluded that 1) industry-specialisation; 2) institutional environments (labour market flexibility, enforcement of property rights, among others); 3) degree of local interconnectedness (trade flows and sectoral linkages) and 4) human and technological capital levels and innovation capacities are the main motives accounting for regional resilience differences.

At an empirical level, Cappelli et al. (2020), Doran and Fingleton (2016), Fingleton et al. (2015) and Cellini and Torrisi (2014) used data from the Great Recession of 2008-2013. They found that resilience varies dramatically across regions, according to their specific specialisation. Interestingly, Romão (2020), observing 55 NUT II in Europe (including the 7 Portuguese regions), and covering distinct economic cycles in the 2006-2017 period, demonstrates that regions with a higher share of employment in tourism exhibit a lower resilience to crises. Moreover, Doran and Fingleton (2016) show that individuals living in high unemployment regions are more vulnerable to unemployment. Cappelli et al. (2020) observed that a region's resilience depends on its relative capacity to create technological knowledge and maintain it over time, as this allows them to adapt and evolve more easily to changing external conditions and return more rapidly to their steady-state equilibrium.



During the present COVID-19 crisis in the EU, Sanchez et al. (2020) showed that regions concentrating on jobs in non-essential sectors with low working-from-home feasibility and high face-to-face interaction requirements are the most affected. Kartseva and Kuznetsova (2020) estimated that, in Russia, individuals living in areas with higher population density are more vulnerable than those living in rural areas. Additionally, Fana et al. (2020) showed that regions with a high share of private employment and low productive service activities are in a riskier position.

Along these lines, it seems reasonable that workers living in regions with an economic structure more specialised in tourism activities are more vulnerable to COVID-19 unemployment. Moreover, these regions tend to have more COVID-19 cases due to a more significant number of face-to-face interactions. The fear of being infected, together with more restrictive government mitigation policies, magnify the contraction of demand for tourism services in these regions and the negative impacts of the crisis. For the same reasons, and following Kartseva and Kuznetsova (2020), our third hypothesis is as follows:

*H3: In the Portuguese tourism and hospitality industry, workers living in regions more specialised in tourism activities and with higher population density are more vulnerable to COVID-19 unemployment.*

#### *Work-contracts*

According to Gash (2008), theories supporting the existence of different work-contracts have their origin in the dual labour market and segmentation theories, and can distinguish workers in the core part of the labour market from workers in the peripheral part. In the core segment, production and employment are stable, and the tasks require a high level of skills and technological development. On the other hand, in the peripheral segment, production and employment fluctuate according to product demand, and tasks do not require specialised skills and are not technology-oriented.

The long-term nature of the investments associated with the first segment and the flexibility required in the second led to one of the primary outcomes of work-contract segmentation: the division between permanent work-contracts, appropriate for the core segment, and temporary work-contracts, more acceptable for the peripheral segment. In this sense, Gebel and Giesecke (2011) state that employers

use temporary work-contracts for three reasons: they provide flexibility to respond to market volatility, reduce firing and hiring costs and allow for a pre-assessment of workers' productivity that can lead to improved hiring decisions. In contrast, permanent work-contracts are more efficient for employers in the context of highly skilled jobs, involve high monitoring costs and require investment in human capital and long-term relations.

Naturally, it is expected that permanent work-contracts provide higher protection against unemployment, which has received fierce support in the empirical literature (e.g., Adams-Prassl et al., 2020; Fana et al., 2020; Kartseva and Kuznetsova, 2020; Bachmann et al., 2015; Baussola et al., 2015). Moreover, analysing the 2008-2013 crisis, Bachmann et al. (2015) found that this effect may hold even under economic shocks by showing that transitions from temporary employment to unemployment increased significantly more than transitions from permanent employment to unemployment. Similar conclusions were drawn by Adams-Prassl et al. (2020), Fana et al. (2020) and Kartseva and Kuznetsova (2020) when evaluating the present COVID-19 crisis in different countries, including Portugal (Almeida and Santos, 2020). Indeed, precarious workers, including those with temporary work-contracts, seem to be the most vulnerable to COVID-19 unemployment. As the presence of temporary workers is particularly significant in the Portuguese tourism and hospitality industry, our fourth research hypothesis is the following:

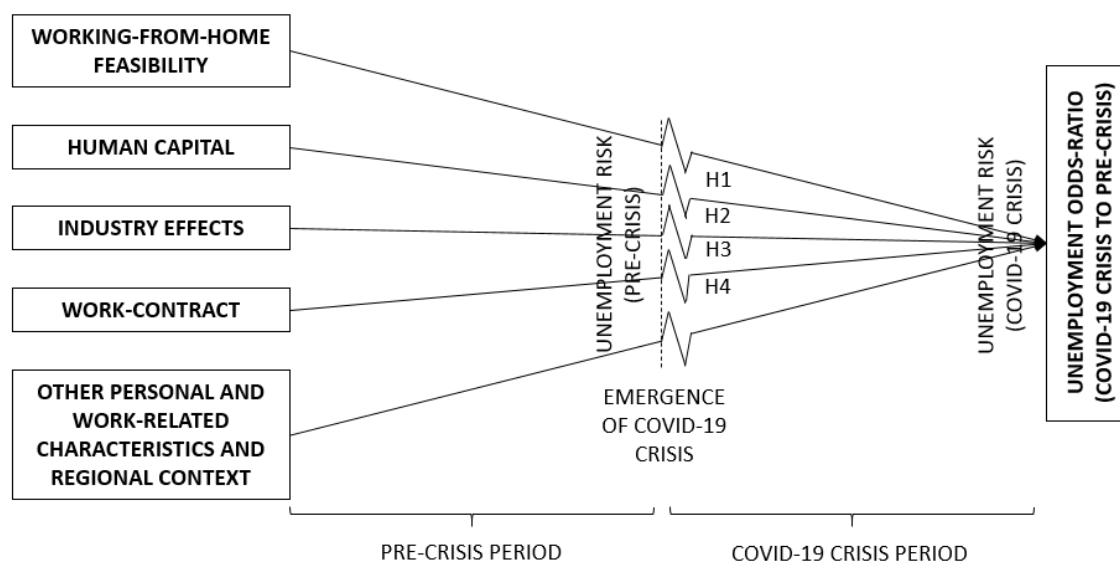
*H4: In the Portuguese tourism and hospitality industry, workers with permanent work-contracts are more protected from COVID-19 unemployment than those with temporary work-contracts.*

In addition to the four research hypotheses explicitly formulated, this study also aims to conduct an exploratory investigation on the effect of other personal and work-related variables on the risk of unemployment during the COVID-19 pandemic, relative to the pre-COVID-19 period. Knowledge about these variables will provide a better understanding of the consequences of the COVID-19 crisis on the Portuguese tourism and hospitality industry and to its employees.

In Figure I, we present a conceptual model of the present research. According to the literature, an individual's unemployment risk depends on their personal, work and region-related characteristics. The emergence of the COVID-19 pandemic, an unpredictable, distinct and disruptive event with

devastating economic consequences, is assumed to alter this dependence. Our conceptual model seeks to identify the Portuguese tourism and hospitality-industry changes using a single outcome variable, the unemployment odds-ratio of losing the job during the COVID-19 crisis versus losing the job before the crisis.

Figure I: Conceptual model



## METHODOLOGY

### *Dataset*

The dataset under analysis was constructed using data from the Institute of Employment and Professional Training (IEFP), including information on the entire population of individuals who have registered as newly unemployed in one of the IEFP centres in mainland Portugal. Registration is mandatory for individuals who want access to unemployment benefits and other social support instruments. The IEFP is the official source for determining Portugal's unemployment rates. The microdata provided by the IEFP includes a) personal information such as gender, age, education, residence county; b) information about the registration process: date, internal identification number, if it is the first registration or not, the desired occupation, and the motive for the unemployment situation

(i.e. fired, quit voluntarily, temporary contract expired, or looking for a first job); c) information about their last job: industry and occupation, coded according to the Portuguese Classification of Occupations (PCO).

After collecting this information, all the 419,293 individual new registrations in the IEFPP centres between November 1, 2019, and July 31, 2020 (representing ~8% of Portugal's total labour force) were inserted into a single database. This nine-month time window was defined to maximise the number of observations during the COVID-19 period while evenly balancing it with the number of pre-COVID-19 observations. From this database, we identified and selected the records of people whose last job was in the tourism and hospitality industry. This filtering procedure yielded a total of 56,142 observations.

These observations were then divided into two subpopulations: pre-COVID-19 (containing all the records with date previous to March 21, 2020) and COVID-19 subpopulation (containing all the records after March 21, 2020). The selected cut-off point (i.e., March 21, 2020) corresponds to the end of the week when the emergency state in Portugal was declared, schools were closed, air traffic was interdicted, and subsequent generic lockdown has occurred. Next, as the IEFPP data contains the official code of the individual's county of residence, the database was matched with INE data on the dimension of the county's tourism industry.

Additional variables were created by transforming the original ones. For example, using the PCO code, it was possible to classify individuals' last employment based on skill required level. According to INE (2011), level 3 involves performing complex technical and practical tasks, such as estimating quantities and costs of materials and human resources for a specific project, the coordination and supervision of human resources and the performance of technical functions. In the tourism and hospitality industry, this level includes directors and executive managers of hotels, food services, trading companies, museums, art galleries, national monuments and museum curators and technicians, conference and event planners and culinary technicians (chefs). Level 2 requires the ability to interpret safety instructions, perform arithmetic calculations and process information. Level 2 jobs include direct support customer staff such as travel consultants and clerks, hotel and other services receptionists, client information workers and personal service workers (as travel attendants and guides,

cooks, waiters and bartenders), cashiers and ticket clerks and hotel doorkeepers. Lastly, level 1 includes performing simple and routine physical or manual tasks such as cleaners, food preparation assistants and luggage porters in hotels and food service establishments.

It should be pointed out that, by looking at the unemployed individual's stated intention regarding the industry in which they desire to work in the future, a dummy variable was constructed. When this variable was assigned a "1", it corresponds to people who want to keep working in the tourism and hospitality industry and may exhibit higher commitment and motivation towards tourism-related occupations. All of the other individuals were assigned a "0". Finally, since tourism employment is sensitive to seasonality, we controlled for it by computing monthly seasonal factors using the data on the individuals who registered in the IEFP centres in the equivalent nine-month period from the previous year (i.e., from November 1, 2018 to July 31, 2019) and employing a multiplicative decomposition approach. In detail, the multiplicative seasonal factor of month  $t$  is the ratio of the number of individuals who have registered as unemployed in month  $t$  to the average number of individuals who registered, per month, during the nine-month observation period.

### *Statistical modelling*

To identify the key characteristics that distinguish the two subpopulations of unemployed individuals and find which characteristics are more (or less) associated with COVID-19 unemployment compared with the pre-COVID-19 period, we used a logistic (logit) regression approach. Probabilistic regression models, including logit models, are widely used in Economics, particularly when the goal is to estimate employment or unemployment odds (e.g., Doran and Fingleton, 2016; Constant et al., 2011; Sueyoshi, 1995; McGregor, 1978) and/or to engage in discriminant analysis between two groups of observations (Lo, 1986). Moreover, when the main interest is in assessing and comparing the importance of different predictors in explaining a discrete outcome variable and not properly in the outcome variable itself, the logit regression assures increased consistency compared to most alternative approaches, such as linear discriminant analysis. Indeed, the logistic regression is robust against deviations from the normality of independent variables, which is especially important when

some of the research hypotheses imply estimating the coefficients of dichotomous predictors (Lo, 1986), as is the case in this paper.

Formally, let  $Y$  denote the set of all new unemployment records during the nine months period under consideration. Also, let  $Y_1$  be the subset of  $Y$  corresponding to the pre-COVID-19 observations and  $Y_2$  the subset of  $Y$  corresponding to the COVID-19 subpopulation. Thus  $Y_1 \cup Y_2 = Y$  and  $Y_1 \cap Y_2 = \emptyset$ . According to the logistic regression specification, the outcome variable's log transformation has a linear relationship with the predictor variables. Here, the outcome event is modelled as a binary variable with the value of 1 if the individual  $i$  became unemployed during the COVID-19 period and 0 if the disruption occurred during the pre-COVID-19 period. Since our data is conditional on the individuals who became unemployed in the nine-month observation period, both the probability of outcome 1 and the probability of outcome 0 are also conditional. Moreover, given that the two outcomes are contrary, as seen above,  $Prob_i(Y_1|Y) + Prob_i(Y_2|Y) = 1$ . The logistic regression equation to be estimated is defined as follows:

$$\log \frac{Prob_i(Y_2|Y)}{Prob_i(Y_1|Y)} = \alpha X_i + \beta Z_{j(i)} + \gamma S_{t(i)} + \theta T_{c(i)} + u_i \quad (1)$$

The vector of predictors  $X_i$  is composed of the observable personal characteristics of individual  $i$ , including age (in years, at the moment of unemployment), the square of age, gender (1=male, 0=female), number of school years, residence [five NUT II in mainland Portugal: Norte, Centro, Alentejo and Algarve were included in the regression; Lisboa e Vale do Tejo (LVT) was set as the baseline region for the regression], and if it is a first registration in the IEFPP centres (1=yes, 0=no).  $Z_{j(i)}$  contains the observable characteristics of the last job  $j$  of individual  $i$ , including the subsector of the job within the industry: accommodation, food services, or other (which includes occupations in travel agencies, tour operators, museums, art galleries and organisation of conferences and convention venues, among others, and was considered as the baseline subsector in the regression); job-specific skills (levels 1, 2 and 3 indicated in PCO, with level 1 set as baseline); the intention of continuing to work in the tourism and hospitality in the future (1=yes, 0=no); and the reason for job disruption [end of temporary work, involuntary job loss (unilateral disruption by the employer), voluntary job loss

(unilateral disruption by the employee, disruption by mutual agreement, and self-employed individuals)], returns to Portugal after emigration, and other (the baseline variable in the regression). The set of independent variables includes the control variable for the seasonal pattern of unemployment in the industry ( $S_{it}$  is the seasonal factor of the month  $t$  in which individual  $i$  became unemployed) and a variable  $T_{c(i)}$ , which measures the importance of the tourism industry in the residence county  $c$  of individual  $i$ . A more detailed description of the variables is provided in Table I. Finally,  $u_i$  denotes the error term, and  $\alpha$ ,  $\beta$ ,  $\gamma$  and  $\theta$  are the vectors of unknown coefficients to estimate.

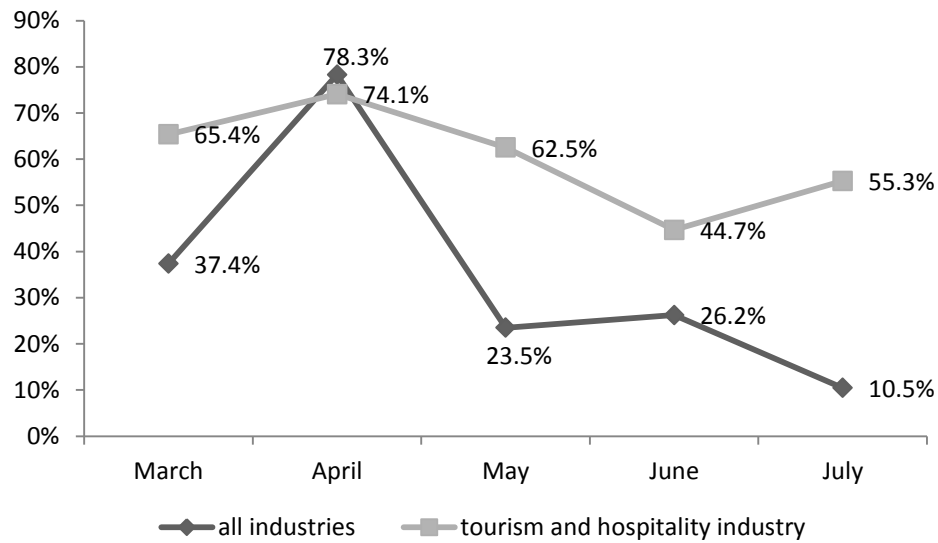
## RESULTS

### *Evolution of unemployment and descriptive statistics*

In Figure II, we present the year-over-year annual variation rates of the IEF new registrations, computed both for the overall economy and the tourism and hospitality industry. This data demonstrates that the impact of COVID-19 in the latter was above the national average, justifying the importance of studying this particular industry in Portugal. This observation is in line with the recent literature on the impact of COVID-19 on unemployment. For example, Montenegro et al. (2020) and Adams-Prassl et al. (2020) showed a positive relationship between working in non-essential occupations with low working-from-home feasibility and requiring high face-to-face interaction (a common feature in the tourism and hospitality industry) and the probability of COVID-19 unemployment.

In March 2020, the number of new IEF registrations with the last occupation in the tourism and hospitality industry was more than 65% higher than the number of new registrations in March 2019. For the overall economy, the number of new registrations grew by 37.4% in the same period. Moreover, even if in April the variation rate of new registrations was slightly lower in the tourism and hospitality industry than in the overall economy, in the last three months of the observation period it was substantially higher. Additionally, in contrast with the overall economy, there is no apparent slowdown in the tourism unemployment trend, suggesting that the effects of COVID-19 may be more long-lasting in this industry than in other industries.

Figure II – Year-over-year IEFP new registrations



The descriptive statistics of our database's main variables are presented in Table I. The statistics for the pre-COVID-19 subpopulation and for the COVID-19 subpopulation are presented, respectively, in column 1 and column 2. The individuals in the population are primarily women (62% of observations) and are, on average, 38 years old, both slightly higher for the pre-COVID-19 subpopulation than the COVID-19 subpopulation. Additionally, the individuals in the dataset have, on average, a little more than nine years of schooling.

Concerning the geographical regions, the differences between the two subpopulations are substantial. Algarve accounts for almost 42% of the records in the pre-COVID-19 subpopulation. In comparison, LVT (the region with the highest population density and where is located the capital city) represents only 20% of the observations in the same period. Furthermore, within the COVID-19 subpopulation, Algarve represents less than 20% of the observations, while LVT accounts for around 36%. Regarding the intensity of tourism activities in the individuals' residence county, there is a high dispersion of the number of tourist arrivals in both subpopulations, with the average value of this variable increasing from the pre-COVID-19 subpopulation to the COVID-19 subpopulation.



Table I: Descriptive statistics - mean (standard deviation)

Variable	Description	Pre-COVID (1)	COVID (2)
Gender (male)	Dummy: 1 if the individual is male; 0 otherwise.	37.6%	38.1%
Age	Age, in years, at the registration moment.	38.7 (12.5)	37.7 (12.0)
Schooling	Number of schooling years.	9.5 (3.6)	9.4 (3.7)
Norte		20.1%	25.7%
Centro	Dummy: 1 if the residence county is in the	12.8%	14.4%
Lisboa e Vale do Tejo	Norte/Centro/Lisboa e Vale do Tejo/Alentejo/Algarve	19.9%	36.1%
Alentejo	region; 0 otherwise.	5.5%	5.2%
Algarve		41.7%	18.6%
County tourism	Average number of tourist arrivals at the residence county (in 2018 and 2019, in ten thousands)	69.0 (116.8)	84.1 (163.5)
Accommodation	Dummy: 1 if the previous job was in the accommodation subsector; 0 otherwise.	23.7%	16.3%
Food services	Dummy: 1 if the previous job was in the food services subsector; 0 otherwise.	72.9%	79.6%
Skills – level 1		40.1%	43.1%
Skills – level 2	Dummy: 1 if the previous occupation requires level 1/level 2/level 3 skills to be performed; 0 otherwise.	55.8%	53.3%
Skills – level 3		4.1%	3.6%
Intention to work in tourism/hospitality	Dummy: 1 if the individual desires to continue working in the tourism and hospitality industry; 0 otherwise.	75.8%	79.0%
Temporary job	Dummy: 1 if the previous job of the individual was of temporary nature; 0 otherwise.	72.0%	67.6%
Permanent job – involuntary disruption	Dummy: 1 if the individual was dismissed from previous permanent job; 0 otherwise.	11.8%	19.9%
Permanent job – voluntary disruption	Dummy: 1 if the individual voluntarily decided to leave previous job; 0 otherwise.	8.5%	6.1%
Return after emigration	Dummy: 1 if the individual registered as unemployed after returning to the country from emigration; 0 otherwise.	4.1%	2.6%
Number of observations		26,855	29,287

We observed that the majority of individuals in the dataset were working in the food subsector, and the share of this subsector in tourism and hospitality unemployment was reinforced after the appearance of COVID-19 in Portugal and the declaration of the emergency state (almost 80% of the observations in the COVID-19 subpopulation). Notably, only 4% of the individuals in the dataset required level 3 skills to execute their previous occupation. This percentage and the number of registrations associated with level 2 skills (in contrast with level 1 skills) decreased from the pre-COVID-19 to the COVID-19 subpopulation. It is also possible to observe that almost 76% of the individuals in the pre-COVID-19 subpopulation plan to continue working in the tourism and hospitality industry. This percentage increases to 79% in the COVID-19 period.

Finally, around 70% of the observations are associated with a fragile job relation with the previous employer (i.e., temporary jobs). Although there was an increase in the absolute number of newly unemployed individuals with temporary jobs from the pre-COVID-19 period to the COVID-19 period, the overall increase in unemployed individuals was more substantial, thus reducing the representativeness of this category during the COVID-19 period. The relative number of individuals who voluntarily decided to leave their jobs was reduced in the COVID-19 subpopulation (as well as those returning after emigration). Furthermore, the relative number of individuals with permanent jobs and were involuntarily dismissed increased significantly in the COVID-19 period.

### *Model Estimation*

The logit model's regression results (equation 1), estimated using Stata and Gretl, are presented in Table II. The fitted model correctly predicts 73.4% of the true outcomes for the 56,142 observations, corresponding to a statistically significant McFadden  $R^2$  of 29.1% (log-likelihood ratio=22,628.39, p-value=0.0000). The results are significantly robust to different modelling designs, with the signals and statistical significance of the coefficients remaining unchanged with the inclusion/exclusion of variables. It should also be pointed out that Variance Inflation Factor (VIF) tests were conducted and confirmed the inexistence of multicollinearity problems (mean VIF=2.26 and maximum VIF=6.117) other than in the variables age and age (squared), which are naturally correlated.

As shown in Table II, the estimated coefficient for the gender variable (1=male, 0=female) is -0.07. This result implies that the ratio of the estimated odds-ratio [i.e.,  $Prob_i(Y_2|Y)/Prob_i(Y_1|Y)$ ] for males to the estimated odds-ratio for females is  $\exp(-0.07)=0.93$ . In other words, the estimated odd of males losing their jobs during the COVID-19 period (compared to pre-COVID-19 period) is 7% lower than the one for females. For a continuous predictor, the interpretation of the coefficient is that, following a one-unit increase in the predictor, the odds-ratio is expected to get multiplied by the exponential of the coefficient. Considering, for example, the predictor schooling, with units in years and an estimated coefficient of -0.0097, one must predict an odds-ratio 1% lower, because  $\exp(-0.0097)=0.99$ , for an individual with nine years of schooling compared with an individual with eight years of schooling (all other characteristics equal). In short, a positive estimated coefficient reveals a characteristic that

makes the individual relatively more vulnerable to COVID-19 unemployment (as compared to the pre-COVID-19 period). In contrast, negative coefficients reveal characteristics that assure higher levels of immunity to the COVID-19 crisis.

Table II: Logit model (regression output)

<i>Variable</i>	<i>Coefficient</i>
Constant	4.1245***
Age	0.0418***
Age (squared)	−0.0005***
Gender (male)	−0.0705***
Schooling	−0.0097***
Norte	−0.0190
Centro	−0.2861***
Alentejo	−0.4134***
Algarve	−1.0568***
County tourism	0.0002**
Accommodation	−0.3091***
Food services	0.0010
Skills – level 2	−0.1887***
Skills – level 3	−0.4339***
Intention to work in tourism/hospitality	0.3738***
Temporary job	0.3596***
Permanent job – involuntary disruption	0.3971***
Permanent job – voluntary disruption	−0.4304***
Return after emigration	−0.5075***
First unemployment	0.3815***
Number of observations	56,142
Correct predictions	73.4%
Pseudo R <sup>2</sup>	0.2911
Log-likelihood ratio	22,628.39(0.0000)

\*p-value<0.1, \*\*p-value<0.05, \*\*\*p-value<0.01

The age coefficient is positive and statistically significant, suggesting that older individuals are more vulnerable to the COVID-19 crisis than younger ones. This effect is observed to be concave, meaning that it gets weakened as the individuals' age increases. Additionally, the results suggest that men are more immune to unemployment generated by the COVID-19 crisis in the Portuguese tourism and hospitality industry than women. This result corroborates hypothesis H1 and is in line with the literature showing that crises have a more significant impact on industries where women are more

representative, since they will be more vulnerable to unemployment than men (Adams-Prassl et al. 2020; Allon et al., 2020; Montenovio et al., 2020).

The education variable's negative coefficient is consistent with previous studies (e.g., Adams-Prassl et al., 2020; Daly et al., 2020; Montenovio et al., 2020). Moreover, the negative and statistically significant coefficients of levels 2 and 3 of job-specific skills align with human capital conceptualisation and constitute an extension of the empirical research on human capital's role in protecting workers from unemployment. As the costs related to the investment of job-specific knowledge acquisition by workers are partially supported by firms (Becker, 1962), discharging a highly skilled employee implies losing the returns from such investment. Hence, when facing a decline in demand, firms are more reluctant to dismiss a highly skilled worker than a low skilled one. Both results strongly validate hypothesis H2.

Our study also provides evidence for significant regional differences. This conclusion is due to the coefficients of Centro, Alentejo and Algarve regions being negative and statistically significant. Indeed, the results reveal that the remaining two regions, those with higher concentrations of people and businesses and where the two main metropolitan areas of Portugal are located, were relatively more affected by COVID-19 unemployment. This result is consistent with the predictions of Kartseva and Kuznetsova (2020). Moreover, the estimated coefficient of the variable "county tourism" is positive and statistically significant, indicating that the residents of counties with strong tourism activity in Portugal are more vulnerable to COVID-19 unemployment than the residents in counties with less tourism activity. This observation is in line with recent literature on the regional economic effects of the COVID-19 crisis, as for example Sanchez et al. (2020), when viewing tourism and hospitality as a non-essential industry with low working-from-home feasibility and with high face-to-face interaction requirements, and Fana et al. (2020), when considering tourism and hospitality as an industry with low share of public employment. These results validate hypothesis H3.

Regarding of work-contracts, our results seem to be contrary to the mainstream literature, given the higher (positive) coefficient of the variable "Permanent job – involuntary disruptions", as compared to "Temporary job". This result indicates that the COVID-19 crisis increased relatively more the odds of getting fired from a permanent job than a temporary one. Nevertheless, when we replicate previous

studies by estimating the model considering all individuals with permanent contracts (involuntary and voluntary disruptions) in a single variable, a negative coefficient is obtained, a result that is in accordance with the literature (e.g., Adams-Prassl et al., 2020; Almeida and Santos, 2020; Fana et al., 2020; Kartseva and Kuznetsova, 2020; Bachmann et al., 2015; Baussola et al., 2015). It is plausible that the divergence of our results from literature is due to the separation between individuals with permanent contracts that decided to leave the firm (voluntary job disruptions) and those dismissed (involuntary job disruptions), which constitutes an important distinction and a new contribution to the field.

The fact that COVID-19 is reducing voluntary job disruptions is likely due to the reduced short-term expectations of individuals finding a better job in the current context and not because of the type of work-contract. Furthermore, since involuntary disruptions are increasing by more than temporary job disruptions, permanent work-contracts are not better at protecting individuals from unemployment in the Portuguese tourism and hospitality industry in the current crisis. Thus, we were unable to validate H4 in this study.

The results confirm the conjecture that the set of policies adopted to fight COVID-19 produces different effects in different subsectors within the tourism and hospitality industry. For example, the accommodation subsector shows greater resilience to COVID-19 unemployment than the food services and the other tourism subsectors. Interestingly, the negative coefficient of the variable first unemployment suggests that the current pandemic crisis is generating "new" unemployment, affecting more of those who have never been unemployed before. Finally, individuals' intention of continuing to work in the tourism and hospitality industry seems to make them relatively more vulnerable to COVID-19 unemployment. This observation is somehow surprising since it suggests that those individuals who were satisfied with their previous occupation in the tourism and hospitality industry, and are more motivated and committed to returning to it in the future, are now at a higher risk of unemployment than in the pre-COVID-19 period than those willing switching to another industry.

## CONCLUSIONS AND DISCUSSION

### *Conclusions*

Similar to what is occurring worldwide, the Portuguese tourism and hospitality industry has been severely affected by the COVID-19 pandemic and the government's mitigation policies. After the emergency state declaration in March 2020, the number of newly unemployed individuals rose at a higher rate in this industry than in the overall economy. This observation is mainly because tourism and hospitality services require a high level of human interaction, making them the first to struggle or shut down due to the increased fear of people contracting the disease or the government's imposition. Unfortunately, COVID-19 cases are still growing, and unemployment is expected to keep rising and at a higher rate in the tourism and hospitality industry than in other sectors. Therefore, understanding which characteristics of individuals makes them more vulnerable or resilient to unemployment during the present COVID-19 crisis, as compared to the pre-COVID-19 situation, is critical from a policy perspective and justifies the present paper's purpose.

By using an extensive micro-level dataset, where several personal and job-related characteristics of 56,142 observations were included, a logit model was created to assess the effects of each considered characteristic on the odds-ratio of becoming unemployed in the COVID-19 period relative to the pre-COVID-19 period. The results confirm that the most vulnerable workers in the tourism and hospitality industry to COVID-19 unemployment are older, less educated and qualified, women and residents in regions with a higher concentration of people and tourism activity. Moreover, the COVID-19 crisis has generated a new type of unemployment, affecting those with more stable jobs and more motivated at work who were never unemployed before and reduced voluntary disruptions.

### *Theoretical Implications*

Our study contributes to the theory of labour market resilience to economic shocks and the literature on tourism and hospitality in three main areas. First, by conducting a detailed micro-level analysis of the COVID-19 crisis literature, we identified new individual factors important for worker resilience to unemployment within the tourism and hospitality industry. These factors include the level of job-

specific skills and the willingness to embrace a new occupation, which exert their influence together with traditional individual factors (age, gender and education) and regional context. Beyond the typical arguments related to the higher productivity of high-skilled workers and the investment made by employers in these workers (Becker, 1962), the present crisis may have reinforced the relative resilience of workers with high skills due to the higher working-from-home feasibility and lower face-to-face requirements of their tasks (Adams-Prassl et al., 2020; Daly et al., 2020). The willingness to embrace a new occupation may also be a signal of higher adaptability and flexibility of these workers, reducing their vulnerability to unemployment.

Second, our study suggests that the present crisis may be breaking established relations from labour economics. Permanent workers are not assured of higher protection against unemployment than temporary ones within the tourism and hospitality industry. This observation may occur because employers' benefits from the increased flexibility of temporary workers are magnified in a context with such extraordinary uncertainty. Indeed, according to Spurk and Straub (2020), in the present context, flexible employment is likely to become increasingly recognised in the labour market.

Third, even though the COVID-19 pandemic is a global crisis, its effects are shown to be more asymmetric than in past crises. There is evidence of substantially different impacts across the Portuguese tourism and hospitality subsectors, geographical regions, occupations, and individuals, with food services and regions with higher touristic activity, revealing higher vulnerability. In the present paper, these increased asymmetries are proved to have their roots not only in regional, industry and political contextual factors, but also in the amplified effects of worker heterogeneity (education, job-specific skills, willingness to work in different occupations, flexibility, adaptability to remote work, among others), consequently enhancing or diminishing individual resilience to unemployment.

### *Practical Implications*

Education seems to help tourism and hospitality workers become more resilient to COVID-19 unemployment. According to Daly et al. (2020, p.4), this justifies the "urgency to focus public efforts towards greater access to higher education, in order to ensure better economic resiliency for the future of the country". This factor is especially critical for women. Thus specific incentives aimed at

reskilling and upskilling this group should be deployed since the effect of job-specific skills is also observed to be of crucial importance for protecting workers from unemployment during crises. In this sense, governments and firms in this sector must encourage individuals to pursue a formal education path and enrol in training courses, to facilitate the development of the required skills to perform specific occupations within the tourism and hospitality industry. The "new normality" will undoubtedly require updating skills and techniques through specific training, covering subjects such as epidemic prevention techniques, contingency planning, risk communication and/or basic healthcare knowledge (Lai and Wong, 2020; Jiang and Wen, 2020).

The COVID-19 crisis is observed to reduce voluntary job disruptions, which typically correspond to individuals who are less motivated and satisfied at work and are trying to find a new occupation or a new employer. Additionally, the ongoing pandemic has also increased the vulnerability of workers committed to and motivated with their occupations. These two results have important managerial and economic implications. They indicate that the COVID-19 crisis reduced the quality of the matching between workers and employers, implying both an increase in the proportion of unsatisfied workers and an interruption in individuals' investment in their desired professional career.

Furthermore, the odds of being fired during the COVID-19 period are also higher for workers with permanent work-contracts (suggesting that permanent contracts may not effectively protect workers from unemployment during the present crisis) and those who have never experienced an unemployment situation before. This observation justifies the using of new and exceptional measures to protect these workers as lay-off permits and other incentives for job preservation. Moreover, there is evidence of regional asymmetries, with workers living in the Norte and LVT regions (the regions with the highest population density) and counties where tourism activities are more abundant experiencing higher odds of getting unemployed during the COVID-19 period.

Our results also justify the need for more attention from policymakers for the subsectors of food services and of other tourism activities, including museums, theme parks and art galleries, than the accommodation subsector. This may be reflected in fiscal policies that promote the consumption of services/products provided by these subsectors and in these regions or through the redirection of public procurement to local food services suppliers or other policy measures. According to Assaf and



Scuderi (2020), Huang et al. (2020) and Jones and Comfort (2020), managers must embrace phased reopening policies while adopting new health safety standards, eventually including some technology-based innovations, to modify their operations and assure consumer protection. These actions are necessary for regaining consumer confidence, increasing sales and protecting employment. Finally, at a national level, all public health policies aimed at decreasing the transmission of the COVID-19 in a gentle manner (i.e., without involving too restrictive interventions), like protective face masks, are expected to increase consumer confidence and help restore the tourism industry to its pre-COVID-19 state.

### *Limitations and Future Research*

The absence of a longitudinal person-period database constitutes a limitation of our study. It prevented us to from studying unemployment's duration, assessing the effect of the COVID-19 pandemic in the transitions from unemployment to employment, and analysing how the effects of predictors evolve with time. Therefore, it would be interesting for future research to extend the present analysis to a longitudinal dataset. Additionally, since the COVID-19 is yet to be controlled, further studies are necessary to understand the medium/long-term effects of the crisis on this industry. It would also be interesting to understand how different pandemic stages (high/low infection peaks) and different mitigation measures affect unemployment across the industry's different subsectors. Finally, further studies comparing the unemployment effects of the current crisis on the tourism and hospitality industry and its effects on other industries are necessary for identifying possible differences in vulnerabilities.

Nevertheless, we believe that the results, implications and policy recommendations in the present study are central to strengthening worker resilience and the whole Portuguese tourism and hospitality industry, consequently increasing its competitiveness and contributing to the country's economic recovery and development at a macro level. To conclude, our results are likely to be extended to other regions of the world, especially those facing a similar situation as the Portuguese, making the above policy recommendations beneficial and effective for them.

## REFERENCES

- Adams-Prassl, A., Boneva, T., Golin, M. and Rauh, C. (2020), "Inequality in the Impact of the Coronavirus Shock: Evidence from Real Time Surveys", *Journal of Public Economics*, Vol.189, 104245. <https://doi.org/10.1016/j.jpubeco.2020.104245>
- Albanesi, S. and Şahin, A. (2018), "The gender unemployment gap", *Review of Economic Dynamics*, Vol.30, pp.47-67. <https://doi.org/10.1016/j.red.2017.12.005>
- Almeida, F. and Santos, J. (2020), "The effects of COVID-19 on job security and unemployment in Portugal", *International Journal of Sociology and Social Policy*, Vol.40(9/10), pp.995-1003. <https://doi.org/10.1108/IJSSP-07-2020-0291>
- Alon, T., Doepke, M., Olmstead-Rumsey, J. and Tertilt, M. (2020), "The impact of COVID-19 on gender equality", Technical report, National Bureau of Economic Research, Cambridge, April. DOI:10.3386/w26947
- Alrwajfah, M., Almeida-García, F. and Cortés-Macías, R. (2020), "Females' perspectives on tourism's impact and their employment in the sector: The case of Petra, Jordan", *Tourism Management*, Vol.78, pp.1-7. <https://doi.org/10.1016/j.tourman.2019.104069>
- Assaf, A. and Scuderi, R. (2020), "COVID-19 and the recovery of the tourism industry", *Tourism Economics*, Vol.26(5), pp.731–733. <https://doi.org/10.1177/1354816620933712>
- Bachmann, R., Bechara, P., Kramer, A. and Rzepka, R. (2015), "Labour market dynamics and worker heterogeneity during the Great Recession – Evidence from Europe", *IZA Journal of European Labor Studies*, Vol.4.19. <https://doi.org/10.1186/s40174-015-0043-0>
- Baum, T. and Hai, N. (2020), "Hospitality, tourism, human rights and the impact of COVID-19", *International Journal of Contemporary Hospitality Management*, Vol.32 No.7, pp.2397-2407. <https://doi.org/10.1108/IJCHM-03-2020-0242>

Baum, T., Mooney, S.K.K., Robinson, R.N.S. and Solnet, D. (2020), “COVID-19’s impact on the hospitality workforce – new crisis or amplification of the norm?”, *International Journal of Contemporary Hospitality Management*, Vol.32 No.9, pp.2813-2829.

<https://doi.org/10.1108/IJCHM-04-2020-0314>

Baussola, M., Mussida, C., Jenkins, J. and Penfold, M. (2015), “Determinants of the gender unemployment gap in Italy and the United Kingdom: A comparative investigation”, *International Labour Review*, Vol.154, pp.537-562. doi:10.1111/j.1564-913X.2015.00028.x

Becker, G. (1962), “Investment in Human Capital: A Theoretical Analysis”, *Journal of Political Economy*, Vol.70(5,Part 2), pp.9–49. <https://doi.org/10.1086/258724>

Beqiri, T. and Mazreku, I. (2020), “Gender unemployment gap in Kosovo -empirical study”, *Journal of Academic Research in Economics*, Vol.12(1), pp.139-150.

Cappelli, R., Montobbio, F. and Morrison, A. (2020), “Unemployment resistance across EU regions: the role of technological and human capital”, *Journal of Evolutionary Economics*, Epub-ahead-of-print. <https://doi.org/10.1007/s00191-020-00693-5>

Cellini, R. and Torrìsi, G. (2014), “Regional resilience in Italy: a very long-run analysis”, *Regional Studies*, Vol.48, pp.1779–1796. <https://doi.org/10.1080/00343404.2013.861058>

Cho, Y. and Newhouse, D. (2013), “How did the Great Recession Affect Different Types of Workers? Evidence from 17 Middle-Income Countries”, *World Development*, Vol.41, pp.31–50.

Constant, A., Kahanec, M., Rinne, U. and Zimmermann, K. (2011), “Ethnicity, job search and labor market reintegration of the unemployed”, *International Journal of Manpower*, Vol.32(7), pp.753-776(24). <https://doi.org/10.1108/01437721111174749>

Couch, K., Fairlie, R. and Xu, H. (2020), “Early Evidence of the Impacts of COVID-19 on Minority Unemployment”, *Journal of Public Economics*, Vol.192, 104287.

<https://doi.org/10.1016/j.jpubeco.2020.104287>

Daly, M., Buckman, S. and Seitelman, L. (2020), “The Unequal Impact of COVID-19: Why Education Matters”, *FRBSF Economic Letter* 2020-17. <https://www.frbsf.org/economic-research/publications/economic-letter/2020/june/unequal-impact-covid-19-why-education-matters/>

De la Rica, S. and Rebollo-Sanz, Y. (2017), “Gender Differentials in Unemployment Ins and Outs during the Great Recession in Spain”, *De Economist*, Vol.165, pp.67–99.  
<https://doi.org/10.1007/s10645-016-9288-x>

Doran, J. and Fingleton, B. (2016), “Employment Resilience in Europe and the 2008 Economic Crisis: Insights from Micro-Level Data”, *Regional Studies*, Vol.50(4), pp.644-656.  
DOI:10.1080/00343404.2015.1088642.

Fana, M., Pérez, S. and Fernández-Macías, E. (2020), “Employment impact of Covid-19 crisis: from short term effects to long terms prospects”, *Journal of Industrial and Business Economics*, Vol.47, pp.391–410. <https://doi.org/10.1007/s40812-020-00168-5>

Fingleton, B., Garretsen, H. and Martin, R. (2015), “Shocking aspects of monetary union: the vulnerability of regions in Euroland”, *Journal of Economic Geography*, Vol.15, pp.907–934.  
<https://doi.org/10.1093/jeg/lbu055>

García, A. and Soest, A. (2017), “Unemployment Exits Before and During the Crisis”, *LABOUR*, Vol.31(4), pp.337-368. <https://doi.org/10.1111/labr.12103>

Gash, V. (2008), “Bridge or trap? To what extent do temporary workers make more transitions to unemployment than to the standard employment contract”, *European Sociological Review*, Vol.24(5), pp.651-668. <https://doi.org/10.1093/esr/jcn027>

Gebel, M. and Giesecke, J. (2011), “Labor Market Flexibility and Inequality: The Changing Skill-Based Temporary Employment and Unemployment Risks in Europe”, *Social Forces*, Vol.90(1), pp.17-39. <https://doi.org/10.1093/sf/90.1.17>

Hoynes, H., Miller, D. and Schaller, J. (2012), “Who Suffers During Recessions?”, *Journal of Economic Perspectives*, Vol.26(3), pp.27–48. <https://doi.org/10.1257/jep.26.3.27>

Huang, A., Makridis, C., Baker, M., Medeiros, M. and Guo, Z. (2020), “Understanding the impact of COVID-19 intervention policies on the hospitality labor market”, *International Journal of Hospitality Management*, Vol.91, pp.1-9. <https://doi.org/10.1016/j.ijhm.2020.102660>

Hutchings, K., Moyle, C., Chai, A., Garofano, N. and Moore, S. (2020), “Segregation of women in tourism employment in the APEC region”, *Tourism Management Perspectives*, Vol.34, pp.1-15. <https://doi.org/10.1016/j.tmp.2020.100655>

IMF (2020), “International Monetary Fund - World Economic Outlook Database”. Available at: [https://www.imf.org/external/datamapper/NGDP\\_RPCH@WEO/OEMDC/ADVEC](https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/OEMDC/ADVEC) (accessed 28 September 2020).

INE (2011), “Classificação Portuguesa das Profissões 2010”. Lisbon (ISBN 978-989-25-0010-2)

INE (2021), “Dashboard COVID-19”, Available at: [https://www.ine.pt/xportal/xmain?xpgid=ine\\_covid\\_dossier&xpid=INE](https://www.ine.pt/xportal/xmain?xpgid=ine_covid_dossier&xpid=INE) (accessed 13 January 2021).

INE (2020), “Atividade Turística – Novembro de 2020 - Estimativa rápida”, December. [https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine\\_destaques&DESTAQUESdest\\_boui=461651607&DESTAQUESmodo=2](https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine_destaques&DESTAQUESdest_boui=461651607&DESTAQUESmodo=2)

Jiang, Y. and Wen, J. (2020), "Effects of COVID-19 on hotel marketing and management: a perspective article", *International Journal of Contemporary Hospitality Management*, Vol.32(8), pp.2563-2573. <https://doi.org/10.1108/IJCHM-03-2020-0237>

Jones, P. and Comfort, D. (2020), "The COVID-19 crisis and sustainability in the hospitality industry", *International Journal of Contemporary Hospitality Management*, Vol.32(10), pp.3037-3050. <https://doi.org/10.1108/IJCHM-04-2020-0357>

Kartseva, M. and Kuznetsova, P. (2020), “The economic consequences of the coronavirus pandemic: which groups will suffer more in terms of loss of employment and income?”, *Population and Economics*, Vol.4(2), pp.26–33. <https://doi.org/10.3897/popecon.4.e53194>

Lai, I. and Wong, J. (2020), "Comparing crisis management practices in the hotel industry between initial and pandemic stages of COVID-19", *International Journal of Contemporary Hospitality Management*, Vol.32(10), pp.3135-3156. <https://doi.org/10.1108/IJCHM-04-2020-0325>

Liu, M., Wang, S., McCartney, G. and Wong, I. (2021), "Taking a break is for accomplishing a longer journey: hospitality industry in Macao under the COVID-19 pandemic", *International Journal of Contemporary Hospitality Management*, Vol.ahead-of-print, No.ahead-of-print. <https://doi.org/10.1108/IJCHM-07-2020-0678>

Lo, A. (1986), "Logit versus Discriminant Analysis: A specification test and application to corporate bankruptcies", *Journal of Econometrics*, Vol.31, pp.151-178. [https://doi.org/10.1016/0304-4076\(86\)90046-1](https://doi.org/10.1016/0304-4076(86)90046-1)

McGregor, A. (1978), "Unemployment Duration and Re-Employment Probability", *The Economic Journal*, Vol.88(352), pp.693–706. <https://doi.org/10.2307/2231973>

Mincer, J. (1991), "Education and Unemployment", National Bureau of Economic Research, Working Paper 3838. <https://doi.org/10.3386/w3838>

Montenovo, L., Jiang, X., Rojas, F., Schmutte, I., Simon, K., Weinberg, B. and Wing, C. (2020), "Determinants of disparities in COVID-19 job losses", National Bureau of Economic Research, Working Paper 27132. <http://www.nber.org/papers/w27132>

Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Iosifidis, C., Agha, M. and Agha, R. (2020), "The socio-economic implications of the coronavirus pandemic (COVID-19): A review", *International Journal of Surgery*, Vol.78, pp.185–193. <https://doi.org/10.1016/j.ijssu.2020.04.018>

Passinhas, P. and Proença, I. (2020), "Measuring the gender disparities in unemployment dynamics during the recession: evidence from Portugal" *Applied Economics*, Vol.52:6, pp.623-636, DOI:10.1080/00036846.2019.1659494

Peiró A., Belaire-Franch J. and Gonzalo M. (2012), “Unemployment, cycle and gender” *Journal of Macroeconomics*, Vol.34(4), pp.1167-1175. <https://doi.org/10.1016/j.jmacro.2012.06.005>

Romão, J. (2020), “Tourism, smart specialisation, growth, and resilience”, *Annals of Tourism Research*, Vol.84, 02995. <https://doi.org/10.1016/j.annals.2020.102995>.

Şahin A., Song J. and Hobijn B. (2010), “The Unemployment Gender Gap during the 2007 Recession”, *Economics and Finance*, Vol.16(2), pp.256-262.

Sanchez, D., Parra, N., Ozden, C. and Rijkers, B. (2020), “Which Jobs Are Most Vulnerable to COVID-19? What an Analysis of the European Union Reveals”, *Research and Policy Brief 34*, World Bank, Washington, DC. <https://openknowledge.worldbank.org/handle/10986/33737>

Santero-Sanchez, R., Segovia-Perez, M., Casto-Nunez, B., Figueroa-Domecq, C. and Talon-Ballestro, P. (2015), “Gender differences in the hospitality industry: A job quality index”, *Tourism Management*, Vol.51, pp.234–246. <https://doi.org/10.1016/j.tourman.2015.05.025>

Segovia-Perez, M., Figueroa-Domecq, C., Fuentes-Moraleda, L. and Munoz-Mazon, A. (2019), “Incorporating a gender approach in the hospitality industry: Female executives’ perceptions”, *International Journal of Hospitality Management*, Vol.76, pp.184–193. <https://doi.org/10.1016/j.ijhm.2018.05.008>

Sueyoshi, G. (1995), “A Class of Binary Response Models for Grouped Duration Data”, *Journal of Applied Econometrics*, Vol.10(4), pp.411-431. <https://doi.org/10.1002/jae.3950100406>

Spurk, D. & Straub, C. (2020), “Flexible employment relationships and careers in times of the COVID-19 pandemic”, *Journal of Vocational Behavior*, Vol.119. <https://doi.org/10.1016/j.jvb.2020.103435>

Theodossiou, I. and Zangelidis, A. (2009), “Should I stay or should I go? The effect of gender, education and unemployment on labour market transitions”, *Labour Economics*, Vol.16, pp.566-577. <https://doi.org/10.1016/j.labeco.2009.01.006>

Turismo de Portugal (2019), “Turismo em Portugal 2019”, Available at:  
[https://travelbi.turismodeportugal.pt/pt-pt-Documents/Turismo%20em%20Portugal/Turismo%20em%20Portugal%20e%20NUTS%20II%20-%202019.pdf](https://travelbi.turismodeportugal.pt/pt-pt/Documents/Turismo%20em%20Portugal/Turismo%20em%20Portugal%20e%20NUTS%20II%20-%202019.pdf).

UNWTO (2019), “World Tourism Organization - Global Report on Women in Tourism – Second Edition”, Madrid, October. <https://doi.org/10.18111/9789284420384>

UNWTO (2021), “International Tourism and COVID-19”, Available at:  
<https://www.unwto.org/international-tourism-and-covid-19> (accessed 13 January 2021)

WHO (2021), “The World Health Organization (WHO) Health Emergency Dashboard”, Available at: <https://covid19.who.int/> (accessed 12 January 2021)

Yacoub, L. and ElHajjar, S. (2021), "How do hotels in developing countries manage the impact of COVID-19? The case of Lebanese hotels", *International Journal of Contemporary Hospitality Management*, Vol.33(3), pp.929-948. <https://doi.org/10.1108/IJCHM-08-2020-0814>