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The Impact of the COVID-19 Pandemic on the Labor Market: An Analysis of Supply and Demand in the Spanish Municipalities

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Abstract: The COVID-19 pandemic represents the largest health and economic crisis in recent history. It has particularly affected the countries of the Mediterranean area, with serious repercussions in terms of not only infections and deaths, but also economic losses. In particular, social distancing measures, severe restrictions, and lockdowns imposed by governments have had serious repercussions on the labor market. The impact of the pandemic on the labor market has prompted numerous researchers to examine and quantify its consequences. However, mainly macroeconomic analyses have been carried out and there is a lack of studies aimed at examining the impact on the labor market in the individual municipalities. This study aims to bridge this gap by examining the consequences of the COVID-19 pandemic on the supply and demand of labor in Spanish municipalities, and the factors that can influence these levels of employment. The results show the relevance of the characteristics of the business fabric in the supply and demand for employment during the first months of the pandemic. In addition, they show that the economic activity of the municipality and the demographic features of the population condition the labor market.

Keywords: labor market; COVID-19 pandemic; municipalities; unemployment; Spanish setting

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1. Introduction

The global spread of COVID-19 represents the largest health emergency since the post-war period. The COVID-19 pandemic has caused numerous deaths, human suffering, restrictive measures, and social isolation [1]. Most of the world's states have implemented strong nonpharmaceutical interventions to reduce the chances of contagion and slow the spread of COVID-19 [2]. However, the effectiveness of these policies has been examined almost exclusively in terms of health outcomes [3–5], while little attention has been paid to the damage caused by the COVID-19 pandemic to the economy and the labor market [6,7]. Governments around the world have had to make important decisions that can be seen as trade-offs between their country's public health and economic well-being [8]. In this regard, the decisions of world governments to apply social distancing measures, severe restrictions, and lockdowns have also had serious economic repercussions on the labor market [9,10].

According to the International Labour Organization [11], in January 2021, 93% of workers around the world resided in countries with restrictions that affected the performance of their work. It also pointed out that, in 2020, 8.8% of global working hours were lost relative to the fourth quarter of 2019, equivalent to 255 million full-time jobs. This circumstance mainly concerned Southern Asia, Southern Europe, Latin America, and the Caribbean. The working hours lost in 2020 were about four times higher than those lost following the financial crisis of 2009. In more detail, the International Labor Organization [11] emphasizes that, in 2020, the decline in working hours resulted in both a loss

of jobs, and a reduction in working hours for those who kept their jobs. In total, there were unprecedented global employment losses in 2020 of 114 million jobs relative to 2019. Employment losses mainly affected women and young workers [11].

The serious consequences of the COVID-19 pandemic on the labor market have also attracted the attention of academics. In fact, there are different studies in the academic literature aimed at analyzing the impact of this event on employment levels. The studies were conducted globally, with particular focus on the US [12–15], Europe [5,16–21], and Africa [22]. These studies, apart from quantifying the consequences of the COVID-19 pandemic on the labor market, have questioned the most affected sectors and individual countries and have analyzed the context situations that have amplified the negative impacts of this pandemic event. However, these studies have examined the consequences of the COVID-19 pandemic on the labor market from a macroeconomic perspective. Little attention has been paid to the analysis of the phenomenon from a perspective connected to individual municipalities.

This study aims to fill this important gap by analyzing the consequences of the COVID-19 pandemic on the supply and demand of labor in the individual Spanish municipalities. The focus on Spain is connected to the importance of this country, which represents the fourth largest economy in the Eurozone, and to the peculiarities of its labor market, which is particularly unstable and has undergone numerous reforms in recent years [23], as well as the serious consequences of the COVID-19 pandemic in terms of infections and deaths [24]. In particular, this study aims to examine the factors that have influenced the supply and demand of labor in the individual Spanish municipalities. In this regard, this study examines the impact of the variables related to the composition of the business fabrics, economic structures, and demographic structures of the municipalities.

During the first months of the pandemic, the Spanish labor market behaved differently depending on the economic characteristics of the municipalities. Thus, on the supply side, the municipalities with companies, low tourist activity, medium–low income levels, and a young population resisted better by increasing the labor supply. However, on the demand side, the municipalities with more salaried workers and greater tourist activity increased the demand for employment, with companies and the primary sector serving as a counterweight.

The remainder of this work is organized as follows: Section 2 introduces the literature review and Section 3 presents the research methodology. Section 4 presents and discusses the results obtained. Finally, Section 5 draws conclusions.

2. Literature Review

Recent research on the impact of the COVID-19 pandemic on the labor market shows a sharp decline in supply by companies, but with significant heterogeneity, depending on the characteristics of the market. A particularly worrying trend among firms is the reduction in the hiring of highly qualified personnel ("downskilling") and hiring in areas far from large cities, actions that harm local government revenues in the short term [25]. From the academic point of view, the first important study is the one conducted by Beland et al. [13]. The authors examined the short-term effects of the COVID-19 pandemic on employment levels and wages in the US, finding that this event led to a reduction in labor force participation and working hours and an increase in unemployment. On the other hand, it had no significant effect on wages. A deeper analysis of the effects of the COVID-19 pandemic on the labor market also showed that the most affected subjects were Hispanics, younger workers, and less educated workers. Regarding the types of jobs most affected by the COVID-19 pandemic, the authors found that occupations that depend on physical proximity to others have suffered more from the consequences of this event than occupations that can be carried out remotely. Still, in the US context, Cortes and Forsythe [14] show that, although employment losses were widespread, they were substantially greater in lower-paying sectors and occupations. In particular, they showed that Hispanics, women, young, and less educated workers suffered most from the effects of the COVID-19 pandemic. Del

Rio-Chanona et al. [15] add that high wages are relatively immune to negative shocks, such as the COVID-19 pandemic, while low-wage jobs are much more vulnerable. Furthermore, in relation to the sectors, the authors highlight that entertainment, tourism, and restaurants are the industries most affected by the COVID-19 pandemic. Bartik et al. [12] confirm a decline in the number of jobs in the leisure, hospitality, and retail sectors, adding that they mainly occurred in small firms and already unhealthy companies.

Similar results were also found in the European context. In this regard, Pouliakas and Branka [21] found that the categories of workers most affected by the COVID-19 pandemic are the most vulnerable, such as foreigners, women, Hispanics, workers with nonstandard contracts (temporary and self-employed workers), workers of microenterprises, and those who are underpaid and poorly educated. Palomino et al. [20] instead highlight a negative impact of the COVID-19 pandemic, mainly on workers, in some sectors, such as hospitality, entertainment, restaurants, and the arts. These sectors are, in fact, those most affected by the restrictions imposed by governments. In Slovakia, Svabova et al. [26] highlight that the anti-COVID-19 measures have limited, or completely stopped, the activities of some sectors, mainly those related to professional services. Barrot et al. [16], through an analysis conducted in France, underline that the decrease in employment caused by the COVID-19 pandemic is the highest in arts and leisure, hotel and restaurants, service activities, food, agriculture, retail and construction, and wholesale, while the lowest is in telecommunications and consulting, computer services, and technical and scientific activities. In relation to the countries most affected, a survey conducted by Eurofound [27] has shown that the Mediterranean countries are those in which the greatest job losses have been recorded. These estimates support the results obtained by Fana et al. [18], according to which job losses were higher in some Mediterranean countries, such as Cyprus, Malta, Spain, Italy, and Greece, in addition to Ireland, while the least affected were the Nordic countries and those of Central and Eastern Europe. Fana et al. [19] add that Italy, Spain, and the UK are more likely to suffer the worst employment consequences of the confinement because of their labor market institutions and productive specializations. In fact, they represent countries characterized by a high level of unemployment and precarious work [19]. Doerr and Gambacorta [17] also highlight the exposure of Southern Europe and France to the negative consequences of the COVID-19 pandemic in terms of jobs, compared to the countries of Eastern, Central, and Northern Europe. Juranek et al. [2] add that, although the COVID-19 pandemic has severely affected the labor market in all states, Sweden has experienced milder consequences than the other Nordic countries. Specifically, the authors demonstrate a delay of about two or three weeks in the occurrence of the negative consequences of the COVID-19 pandemic on the Swedish labor market compared to that of the other Nordic countries, and a lower cumulative sum of new job losses. Other research has found an increase in unemployment (demand) in the labor market in Romania, where the COVID-19 pandemic has also influenced the mindset of workers, which placed a higher value on workplace health and working conditions to prevent COVID-19 [28].

Similar results to the other regions were also found in the African context. In this regard, Jain et al. [22] found a 40% decline in active employment, of which half related to the termination of work, with persistent effects on the labor market. The authors add that workers belonging to vulnerable categories are those most affected by the COVID-19 pandemic and highlight that only a low percentage of them received subsidies, while a large proportion of workers in difficulty did not have access to any of the main forms of social protection.

The literature review carried out shows the important consequences of the COVID-19 pandemic on the world labor market. The presence of the important consequences in the Spanish context is also discussed. However, the academic contributions have conducted research mainly at the macroeconomic level, and the lack of attention to the analysis of the factors capable of influencing the demand and supply of labor in individual municipalities is evident. This study aims to fill this important gap in the literature.

3. Materials and Methods

The methodology used in this research was carried out in three stages: First, after reviewing the literature, we selected the sample based on the information available. Secondly, we prepared a database with the municipalities that provides information on the variables necessary for our analysis. Thirdly, we proposed the regression models and performed their estimations, verifying their validity.

3.1. Sample

More than a year after the declaration of the COVID-19 pandemic, it is difficult to obtain valid and reliable data on the magnitude of this terrible health crisis. Currently, international organizations provide estimates for the main economic and social indicators (World Bank), or figures prior to the start of the pandemic (International Monetary Fund). This type of information at the national level conditions the analyses, taking into account the political, economic, and social differences between countries. Furthermore, the fluctuations in the pandemic around the world, and its unfinished consequences, make statistical and methodological analyses even more difficult. For this reason, and following research already published [29,30], we consider it more appropriate to use actual data at the local level for a single country in order to obtain a homogeneous environment.

We selected Spain as one of the leading countries in Europe (the fourth largest economy in the Eurozone), and which presents as a salient feature an unstable labor market that has undergone several reforms in recent years [23]. Moreover, Spain has been one of the countries worldwide most affected by the COVID-19 pandemic, with more than 3 million confirmed cases and 70,000 deaths (data as of 1 March 2021). Consequently, our units of analysis are the Spanish municipalities that have reported on the labor market in their respective territories.

Of the 8131 municipalities existing in Spain on 1 January 2020, 5.12% have a population of over 20,000 inhabitants; however, 69.73% of the population resides in them. Because of their demographic characteristics, these municipalities are relevant to the country's economy as a whole and offer complete and timely information. Once the municipalities with incomplete data or numerical errors on the selected variables (see Table 1) were filtered out for the year 2020, the final sample was made up of 393 Spanish municipalities, with a population of over 20,000 inhabitants.

3.2. Variables

To understand the impact of the COVID-19 pandemic on the labor market, we differentiate between Supply and Demand, i.e., between employers and employees [15,31]. Both variables were obtained from the rate of change between the values recorded before the pandemic (January 2020) and during January 2021, the latest data available at the time of this research. Although labor supply can be considered as the number of workers willing to perform a labor activity, in this research, we call the Supply variable the number of contracts made by the firms. On the other hand, demand can be considered as the companies' need for labor, being, in this research, the Demand variable, or the quantity of workers willing to perform a labor activity [15]. In sum, our orientation of Supply and Demand is established from the point of view of the firm since the research objective is to know the impact of the COVID-19 pandemic on the labor market from the perspective of the firms [31].

With regard to the environmental factors that can condition the labor market, we selected variables that identify the composition of the business fabrics (Self-employed workers, Companies, and the Primary and Secondary sectors), the economic structures (Income and Tourism), and the demographic structures (Average age) of the municipalities [21,32]. The percentage of self-employed workers and companies represents the proportion of companies without employees and with more than 50 employees [13], respectively, while the Primary sector and Secondary sector represent the proportion of companies whose main activity is in the primary and secondary sectors, respectively. To

avoid the perfect multicollinearity that would invalidate the estimation, we replace the Tertiary sector by the variable, Tourism, taking into account that the latter includes a large portion of the economic activity performed in this sector [20].

On the other hand, in order to identify the economic characteristics of the municipalities that may influence the labor market, we selected the average disposable income (Income) per respondent of the income tax, and the level of tourism activity in the municipalities (Tourism) [32]. Finally, and taking into account the most vulnerable segment of the population initially affected by COVID-19, we incorporated the average ages of the populations of the municipalities (Average age) [18]. Table 2 shows the sources of information, the units of measurement, and the description and descriptive statistics of the variables.

3.3. Model

With the following regression models, we determine the impact of the main labor market characteristics (environmental variables) on both the labor Supply (1) and Demand (2) after the COVID-19 pandemic.

$$\begin{aligned} Supply_i = \beta_0 + \; & \beta_1 Self-employed\ workers_i + \beta_2 Companies_i + \beta_3 PrimarySector_i + \beta_4 SecondarySector_i \\ & + \beta_5 Income_i + \beta_6 Tourism_i + \beta_7 Average\ age_i \\ & + \varepsilon_i \end{aligned} \quad (1)$$

$$\begin{aligned} Demand_i = \beta_0 + \; & \beta_1 Self-employed\ workers_i + \beta_2 Companies_i \\ & + \beta_3 Primary\ Sector_i + \beta_4 Secondary\ Sector_i + \beta_5 Income_i \\ & + \beta_6 Tourism_i + \beta_7 Average\ age_i \\ & + \varepsilon_i \end{aligned} \quad (2)$$

where Supply and Demand are the dependent variables for each model; β_0 is the constant; β_j are the coefficients; Self-employed workers, Companies, Primary sector, Secondary sector, Income, Tourism, and Average age are the independent variables for each municipality; and ε_i is the error term.

The characteristics of the dependent variable usually determine the estimation of the most appropriate regression model. In our case, we used an ordinary least squares model with R-Studio software. This estimation is sensitive to the similarity between the explanatory variables of the model, so it is necessary to analyze the independence of these variables to confirm the proper interpretation of the results [32]. To this end, we performed three analyses that confirm the suitability of the ordinary least squares estimation [32]. First, in Table 2, we present the correlation coefficients between the explanatory variables. It is worth noting the significance of some of them. In addition, we identify an adequate relationship between the significance of the *t*-values and the R^2 of the model. Finally, in Table 3, we present the variance inflation factors (with values lower than 2.7) [32]. In this way, we verify the absence of multicollinearity issues, thus confirming the adequate estimation and validity of the results [32].

Table 1. Description and descriptive statistics of the variables.

Variable	Description	Min	Mean	Median	Max	Std.dev
Supply	Rate of variation of registered employment contracts from January 2020 to January 2021 [a]	−0.8571	−0.2580	−0.2740	2.0544	0.2693
Demand	Rate of variation of registered job seekers from January 2020 to January 2021 [a]	0.0066	0.2392	0.2307	0.9103	0.1220
Self-employed workers	Percentage of total number of firms without salaried workers [b]	51.0379	56.4195	56.4689	60.4733	2.1144
Companies	Percentage of total number of firms with more than 50 employees [b]	0.3402	0.8222	0.7728	1.2270	0.2246
Primary sector	Percentage of total firms engaged in extraction and production of raw materials [b]	0.3235	1.0549	0.8949	3.3372	0.5815
Secondary sector	Percentage of total firms engaged in industrial and artisanal activities [b]	8.3701	15.0096	14.8529	21.7396	2.2899
Income	Average annual disposable income of income tax payers in EUR [c]	11,701.4692	18,667.2683	17,955.5498	53,094.3224	4708.4635
Tourism	Index of tourist activity in the municipality [d]	0.0000	210.9010	21.8427	11,832.8717	887.2389
Average age	Average age of the inhabitants of the municipality expressed in years [e]	33.2772	41.6494	41.6141	50.2037	2.5419

[a] Data from https://sepe.es/HomeSepe/que-es-el-sepe/estadisticas/datos-estadisticos.html (accessed on 1 March 2021); [b] Data from https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736160707&menu=ultiDatos&idp=1254735576550 (accessed on 1 March 2021); [c] Data from https://www.agenciatributaria.es/AEAT.internet/datosabiertos/catalogo/hacienda/Estadistica_de_los_declarantes_del_IRPF_por_municipios.shtml (accessed on 1 March 2021); [d] Data from Lawrence R. Klein Economic Institute (2019); [e] Data from https://www.ine.es/dynt3/inebase/index.htm?padre=6232&capsel=6233 (accessed on 1 March 2021).

Table 2. Coefficient of correlation variables.

	Self-Employed Workers	COMPANIES	Primary Sector	Secondary Sector	Income	Tourism
Companies	*** 0.5682	1.0000				
Primary sector	*** −0.6454	*** −0.5881	1.0000			
Secondary sector	*** −0.3137	*** −0.2764	*** 0.3884	1.0000		
Income	*** 0.4560	*** 0.4734	*** −0.3402	−0.0640	1.0000	
Tourism	0.1086	0.0429	−0.0998	−0.0504	* 0.1595	1.0000
Average age	*** −0.2077	*** −0.1954	*** 0.2623	*** 0.2422	−0.0900	0.0644

Significance: *** 1% and * 10%.

Table 3. Variance inflation factor (VIF) of variables.

	Supply			Demand		
	Model 20,000–50,000	Model > 50,000	Model Full	Model 20,000–50,000	Model > 50,000	Model Full
Self-employed workers	2.034572	2.186549	2.038725	2.034572	2.186549	2.038725
Companies	1.762597	2.337775	1.862159	1.762597	2.337775	1.862159
Primary sector	1.962632	2.606711	2.098004	1.962632	2.606711	2.098004
Secondary sector	1.203930	1.474532	1.240160	1.203930	1.474532	1.240160
Income	1.684330	1.279741	1.436406	1.684330	1.279741	1.436406
Tourism	1.052893	1.072647	1.046110	1.052893	1.072647	1.046110
Average age	1.058201	1.365464	1.115094	1.058201	1.365464	1.115094

4. Results and Discussion

The results of estimating the labor Supply and Demand with the selected variables (Models 1 and 2) are shown in Tables 4 and 5, respectively. In order to obtain more detail on the impact of these variables on the labor market after the COVID-19 pandemic, we performed three estimations: the first using municipalities with a population between 20,000 and 50,000 inhabitants; the second using municipalities with over 50,000 inhabitants; and the third with all municipalities. In this way, we control for the effect of the size of the municipality on the labor market [32].

Table 4. Results of regression model, labor supply (V.D. Supply).

	Model 20,000–50,000	Model > 50,000	Model Full
Intercept	−1.267e−02 (−0.019)	** 2.389e+00 (2.561)	7.201e−01 (1.319)
Self-employed workers	1.185e−03 (0.114)	** −3.728e−02 (−2.504)	−1.380e−02 (−1.591)
Companies	*** 3.117e−01 (3.389)	*** 6.009e−01 (4.292)	*** 4.334e−01 (5.553)
Primary sector	2.016e−02 (0.546)	1.692e−02 (0.292)	1.906e−02 (0.596)
Secondary sector	** 1.528e−02 (2.165)	7.644e−03 (0.653)	1.025e−02 (1.641)
Income	*** −1.760e−05 (−3.925)	* −9.280e−06 (−1.866)	*** −1.185e−05 (−3.624)
Tourism	*** −3.496e−04 (−5.774)	−2.406e−05 (−1.376)	** −3.536e−05 (−2.388)
Average age	* −1.154e−02 (−1.960)	** −2.291e−02 (−2.187)	** −1.203e−02 (−2.254)
R-squared	0.2198	0.1866	0.1238
F-statistic	*** 9.778	*** 4.391	*** 7.769
n	251	142	393

Significance: *** 1%, ** 5%, * 10%, coefficients and (*t*-value).

The number of employees in a company represents its size and its capacity to provide jobs. Companies without employees, because of their characteristics, do not provide jobs, but they can improve the economic activities of others and contribute to a greater supply. However, in the most populated municipalities (Model > 50,000), the greater existence of self-employed workers led to a reduction in the supply of jobs during the first months of the pandemic, which can be interpreted in the sense that when the business fabric is highly atomized from the labor point of view, workers suffer more than when there are large companies. In fact, the latter (Companies) have indeed boosted the labor market by increasing the number of jobs on offer, which has led to an improvement in supply in all the municipalities analyzed that have a business fabric of this nature.

With regard to the branch of business activity, this was not a determining factor for the labor supply during the COVID-19 pandemic. It is only in the case of medium-sized municipalities (Model 20,000–50,000) that the supply improves with greater business activity in the secondary sector. We understand that, in these municipalities, greater industrial activity boosts the local economy, increasing the labor supply among the active population. Moreover, industrial activity has been one of the least affected by the temporary cessation of economic activity to prevent the spread of COVID-19.

The income levels of citizens (Income) are a measure of their present or past employment situation, i.e., citizens with high incomes have had, or have, stable and well-paid jobs. We understand that labor income is related to the business fabric, where the best salaries will be found in the most solvent companies. Thus, in municipalities with higher incomes per taxpayer, the labor market will be more stable, thus reducing the labor supply.

On the other hand, one of the economic activities that has been most affected by COVID-19 is tourism. The ban on travel and socializing to reduce the spread of the virus has endangered this sector, which is very important in some areas of Spain. Specifically, in medium-sized municipalities (between 20,000 and 50,000 inhabitants) with a high potential for tourism, the supply of jobs has been reduced because of the paralysis of this sector. The results confirm the same effect for all municipalities (Model Full); however, in larger municipalities (Model > 50,000), where more diversified economic activities are assumed, tourism does not have a significant effect.

Table 5. Results of regression model, labor demand (V.D. Demand).

	Model 20,000–50,000	**Model > 50,000**	**Model Full**
Intercept	3.366e−01 (1.111)	1.340e−01 (0.410)	3.612e−01 (1.534)
Self-employed workers	7.186e−03 (1.539)	7.941e−03 (1.523)	** 7.970e−03 (2.131)
Companies	*** −1.152e−01 (−2.784)	** −1.218e−01 (−2.484)	*** −1.457e−01 (−4.332)
Primary sector	*** −4.673e−02 (−2.811)	*** −5.507e−02 (−2.712)	*** −5.397e−02 (−3.913)
Secondary sector	−3.196e−03 (−1.007)	6.218e−04 (0.152)	−1.681e−03 (−0.624)
Income	* 3.538e−06 (1.754)	8.320e−08 (0.048)	1.644e−06 (1.166)
Tourism	*** 2.666e−04 (9.785)	*** 1.675e−05 (2.736)	*** 2.702e−05 (4.233)
Average age	*** −9.449e−03 (−3.566)	−4.921e−03 (−1.342)	*** −9.750e−03 (−4.238)
R-squared	0.4239	0.2074	0.2065
F-statistic	*** 25.54	***5.01	*** 14.32
n	251	142	393

Significance: *** 1%, ** 5%, * 10%, coefficients and (*t*-value).

Finally, the average age of the population is a characteristic of the labor market that may explain its dynamism. Older municipalities will have a smaller active population, thus reducing the labor supply. Moreover, job consolidation is achieved over the years so that the older population will have a more stable employment situation in the face of economic fluctuations caused by a crisis of the dimensions of the one caused by COVID-19.

The results confirm that, for all municipalities, an increase in the Average age reduces the labor market supply.

On the Demand side, for the set of municipalities (Model Full), the labor market worsens in those with the highest number of companies without employees (Self-employed workers), thus confirming the opposite effect of Supply. The solvency capacity of these workers has not been able to withstand the effects of the COVID-19 pandemic, with them being the first to cease activity and demand new employment. On the other hand, a greater presence of companies with a high number of salaried workers (Companies) has reduced the demand for employment during these months of the pandemic in all the municipalities analyzed. The greater capacity of these companies to offer jobs explains the reduction in demand. These results are consistent with those obtained in Supply, where a greater presence of these companies increases the supply of jobs.

With regard to the branch of business, the primary sector has had a significant impact on the reduction in the unemployed. During the successive confinements to reduce the spread of the COVID-19 virus, the demand for essential foodstuffs has increased considerably because of the impossibility of consuming food outside the home. This increase in demand caused companies in the primary sector to absorb the unemployed from other sectors. Thus, in municipalities with a greater number of companies producing essential products, the demand for employment was reduced during the months of the pandemic. However, the presence of firms in the secondary sector did not have a significant effect on the employment demand.

Exceptionally, in medium-sized municipalities (Model 20,000–50,000), we find a positive effect of income levels on the labor demand. Contrary to Supply, in municipalities with higher incomes per taxpayer, unemployment is higher, which is the opposite of what might be expected if we were to link income level to job stability. This fact shows that the pandemic has affected all social classes, regardless of their economic levels.

As noted above, tourism has been one of the economic activities most affected by the measures implemented to reduce the transmission of the COVID-19 virus. Therefore, in the most touristic municipalities (Tourism), the cessation of activity in this sector has led to an increase in the demand for employment. These results are confirmed in all the municipalities analyzed, thus highlighting the importance of this sector in some areas of Spain.

In line with the results obtained in the Supply estimation, the older municipalities (Average age) have a smaller active population, so their demand for employment is lower. Moreover, if we relate age to employment stability, older populations demand less employment. These results are confirmed for medium-sized municipalities (Model 20,000–50,000), and for all municipalities (Model Full).

In sum, we can observe the differences that occur in the labor market according to the perspective of the analysis and impact of the COVID-19 pandemic. On the one hand, the number of contracts is conditioned by the sizes of the companies, as well as the incomes and the average ages of the citizens. On the other hand, the demand for workers depends mainly on the sizes and sectors of the activities of the companies and the tourist activities of the municipalities. These differences may be due to the orientation of the analysis, i.e., according to the needs of those who offer or demand work. In addition, the sizes of the municipalities must be taken into account, which determine the capacity of the local governments to stimulate the labor market.

5. Conclusions

The aim of this study was to examine the consequences of the COVID-19 pandemic on the supply and demand of labor in individual Spanish municipalities. In particular, it aimed to analyze the factors capable of influencing these employment levels. The COVID-19 pandemic has upset the balance of European states [33] and, in particular, of Spain [34]. During the first months of the pandemic, the labor market in Spain was conditioned by the restrictions imposed on mobility in order to slow the advance of the virus. The economic

and social characteristics of the municipalities have allowed the impact of this pandemic to be graduated. Thus, municipalities with a business structure made up of large companies have increased the supply of jobs, while municipalities with low per capita incomes, low tourist activity, and a high average age of the population have reduced the supply. On the other hand, municipalities with more self-employed workers and greater tourist activity have seen an increase in the demand for employment, while municipalities with companies, extensive activity in the primary sector, and a high average age of the population have seen a decrease in the demand for employment.

This study significantly contributes to the enrichment of the academic literature. Firstly, it extends the knowledge about the effects of the COVID-19 pandemic on the labor market. In particular, this study allows for an understanding of the effects on the supply and demand of labor in the individual municipalities and helps to improve the implementation of public employment policies at the local level. In this regard, it fills an important gap in the literature. Secondly, this study extends the knowledge of the factors capable of influencing the employment levels of individual municipalities in light of the COVID-19 pandemic.

This study has important implications for governments. In light of the restrictions imposed to mitigate the health consequences related to the COVID-19 pandemic, they should provide financial subsidies to companies to avoid layoffs. At the same time, governments should support vulnerable workers who have suffered the worst consequences of the COVID-19 pandemic. In addition, the results are also useful for employers, where the impact of the characteristics of the labor market (numbers of employees, sectors of activity, income levels, tourism activity, or average ages) can guide their employment policies and investment decisions, as well as their contingency plans for future crises. In addition, the results can improve the effectiveness of public employment policies by addressing the needs of employers.

However, this study is not without limitations. The first limitation is related to the focus on a single country—Spain—which could create problems in the generalization of the results. A second limitation is connected to the unavailability of data for all years, and for all municipalities, which has considerably reduced the scope of this study. However, these limitations do not reduce the general quality of this work and, above all, provide important insights for future research. Future studies, in fact, will be able to carry out comparative analyses between municipalities in different countries and will be able to analyze the phenomenon over longer periods of time, also observing the possible recovery of the labor market. Furthermore, future studies will be able to extend the number of variables tested to better understand the factors that can influence the supply and demand of labor.

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