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***Non-Working Workers: The unequal
impact of Covid-19 on the Spanish labour
market***

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Keywords: Unemployment, Severity, Incidence, Unemployment
Duration, Inequality, Covid-19

JEL Classification: J01, J21



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NON-WORKING WORKERS

The unequal impact of Covid-19 on the Spanish labour market*

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Abstract:

We present an evaluation model that aims at developing a synthetic index of non-employment that combines incidence and severity. This index considers, besides conventional unemployment rates, unemployment duration, discouraged workers and workers with suspended jobs. We have applied this methodology to the analysis of the impact of the Covid-19 in the Spanish labour market. The impact of the epidemics on the job market has been very asymmetric by regions and types of workers. Compared to the situation in the third quarter of 2019 we find that one year later the non-working index arrived to more than 150 in regions in the south whereas it is below 75 in regions like Navarra, Catalunya or Madrid. The dynamics of this indicator, though, shows that the larger increments have occurred among the regions with lower initial values, so that the variability is now smaller. Regarding age and education, we find that the young (and among them the less educated) are the population subgroup that suffers more intensely the impact of this new economic crisis. On the contrary, older workers seem to improve for all education subgroups during 2020. The main reason behind this is the asymmetric concentration of temporary collective redundancy scheme measures among older workers, what is very much connected with the dual character of the Spanish labour market regarding contract types and job security.

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1. Introduction

The Covid-19 is having vast implications on many aspects of life, from health to social behaviour, and has hit severely all the economies, which were regaining momentum after the financial crash of 2007. By March 2020 most of the countries had recovered pre-crisis activity levels and GDP figures. The labour market followed a similar path and the menacing unemployment rates of 2013 had returned to the more familiar values. Analysing the impact of these economic shocks, however, makes it clear that conventional unemployment rates are too crude indicators of the state of the labour market, especially after the explosion of the pandemics. And this is so even if unemployment rates are disaggregated by regions and types of workers within countries, in order to grasp the asymmetries of the labour market dynamics.

There are three main reasons to support a richer approach to the measurement of unemployment. First, the need to keep track of unemployment duration, which is one of the key aspects that determine the social cost of unemployment. There is evidence that important reductions of unemployment rates may go together with an increase of unemployment duration (e.g. Sanz de Galdeano & Terskaya, 2020). This entails the progressive marginalization of part of the labour force (Bentolila, García-Pérez & Jansen, 2017). Long-term unemployment implies the accumulation of periods of low income, affects social integration and people's self-respect, exhausts unemployment benefits, and reduces the probability of getting a new job. The idea that duration should be included systematically in the measurement of unemployment has already been proposed years ago. Sengupta (2009) and Shorrocks (2009 a, b) provide formal models that apply the approach of poverty measurement to this problem; Goerlich & Miñano (2018) use this methodology to analyse the Spanish labour market; Gorjón, de la Rica & Villar (2020) extend those ideas to incorporate income losses and transition probabilities from a social welfare perspective. The implications of long periods of unemployment for the future are also being analysed under the suggestive name of the scar of unemployment (e.g. Gangi, 2006, García-Pérez & Vall-Castelló, 2015, de Fraja et al, 2017, von Wachter, 2020).

The second reason refers to the impact of the business cycle on the labour force, in particular on how the statistics should compute those workers who would like to work and yet are not actively seeking a job. They are *the discouraged*, so that they implicitly estimate that the cost of the search exceeds the expected earnings that could be achieved. The conventional unemployment rate computes those individuals as inactive, rather than as unemployed. This is an arguable attribution per se and may hide the true impact of economic shocks that involve changes in the labour force, due to changes in expectations and attitudes. Nowadays the US Bureau of Labour Statistics provides up to six different measures of unemployment, from less to more inclusive. The U3 measure corresponds to the conventional unemployment rate. U4 adds those discouraged and U5 includes, additionally, those “persons marginally attached to the labour force”. The difference between U3 and U5 measures may be quite large and here again we find asymmetries in that gap between regions and types of workers within a society.

The third reason is directly linked to the economic impact of the Covid-19, because it has introduced a new category of workers: those with *suspended jobs*. That is, workers whose activity has temporarily ceased (or substantially reduced in terms of hours) even though they keep their contracts and receive some public funding meanwhile.¹ This figure might have formerly existed in some countries, but it affects now a large number of individuals and is playing a key role in buffering the impact of the pandemic over the labour market.

The purpose of this paper is to measure the impact of Covid-19 on unemployment in a setting that takes into account, besides conventional unemployment rates, unemployment duration, discouraged workers and workers with suspended jobs. We call *non-working workers* (NWW) the union of those three groups. We look for an evaluation of the situation and the evolution of this collective in Spain in the third quarter of 2020 relative to the third quarter of 2019. We compare the differences observed among the regions, on the one hand, and among the types of workers, according to gender, age and education, on the other hand.

The analysis requires suitable data and evaluation protocols. Regarding the data we shall make use of the standard Labour Force Survey (Encuesta de Población Activa), which provides quarterly all the info required. As for the evaluation protocol for the non-

¹ In Spain we talk about ERTE, acronym of “Expediente de Regulación Temporal de Empleo”.

working workers, we recur to a familiar indicator that consists of the product of the *incidence* and the *severity*. Incidence refers to how many NWW are relative to the extended labour force (i.e. including discouraged workers both in the numerator and the denominator). Severity is an index that tells us how bad is the NWW situation in a society, relative to a given benchmark (Spain in the third quarter of 2019 in our analysis), by comparing the distributions of the NWW in different situations: discouraged, unemployed depending on duration, and suspended jobs (we follow here an idea in Herrero & Villar, 2020). This synthetic indicator, that we call *Non-Working index*, may be regarded as a sort of poverty index, as it measures the social negative impact of the lack of employment over a part of the population.²

Between the third quarter of 2019 and that of 2020 the incidence of the non-working workers in Spain has increased by more than 40%, whereas severity has decreased by some 24%, due to the alleviating effect of suspended jobs.³ The Non-Working index has increased about 8% during this period. Those average values, though, correspond to very different situations when we consider the impact of the crisis over the regions or between different types of workers. Setting 100 the value of the index for Spain in 2019 we find that the range of variation between the regions goes from 57 to 257 in 2019 and from 62 to 241 in 2020. Regarding the differences by types of workers we find three key outcomes. First, that women are worse-off than men in 2019 and 2020, even though the increase in their index is smaller. Second, that the youngest cohort is the population subgroup who has been hit harder by the crisis (the Non-Working index of this group has doubled during the period with respect to an 8% overall increase). Third, differences in education have a strong influence on the impact of the crisis: letting Spain in 2019 equal to 100, the index for those with tertiary education moves between 55 and 59 whereas that for the less educated does it between 138 and 159.

The rest of the paper is organized as follows. Section 2 presents the evaluation protocol, which is applied to the analysis of the Spanish job market in Sections 3

² A welfare-oriented approach, partly sharing this methodology, appears in Herrero & Villar (2019). They provide an evaluation of complete labour structures that compute the distribution of both employed and unemployed over a set of categories.

³ Note that “suspended jobs” is the best category among the non-working workers and that it was basically empty in 2019 whereas it gathers a substantial share of the NWW in 2020. As severity is obtained from the comparison of the relative frequencies of the NWW, this shift in the distribution across categories induces a reduction of this variable. Even a reduction in severity might seem unintuitive at first regard, once we understand that it refers to the composition and not to the level, the result is far from unexpected.

(generalities), 4 (the regions) and 5 (types of workers by gender, age and education). A few final comments are gathered in Section 6.

2. The index

Our reference is a society (e.g. a country) in which we can distinguish a number of social groups, $g = 1, 2, \dots, G$ (e.g. regions or types of workers). The **Non-Working Index** for group g , $I_{NW}(g)$, is given by the product of the incidence and the severity of this phenomenon, $i(g) \times s(g)$ (actually multiplied by 100 to get a more intuitive meaning of the figures).

For each social group g , the index computes the share of people who do not work while being willing to do so, relative to the (extended) labour force, $i(g)$, times how severe is their situation as non-working individuals, $s(g)$. This is a standard way of approaching the impact of a given phenomenon on a population subgroup, as in the case of poverty measurement (e.g. Chakarvarty 2009, Villar 2017). We now discuss how to define those two variables.

The non-working workers (NWW, for short) are given by the sum of three different groups:

- (a) *Unemployed*: Those without a job and actively looking for one;
- (b) *Discouraged*: Those who are ready to work but do not actively seek for one due to the lack of hope to succeeding; and
- (c) *Suspended*: Workers whose activity is temporary suspended (totally or partially) but keep the contract with the firm and receive some compensation during the interim period (people in the ERTE, in the Spanish case).

Let $n_w(g)$ denote the NWW in social group g and let $n(g)$ denote the corresponding *extended labour force*, by which we mean the sum of the conventional labour force and the discouraged workers.⁴ Similarly, let $n_w(0)$ and $n(0)$ denote the same concepts for the reference group (Spain in the third quarter of 2019 in our empirical analysis). We define the incidence of NWW in social group g , $i(g)$, as the relative share of NWW with respect to the reference group. That is,

⁴ Note that “suspended” workers are part of the conventional labour force, together with those employed and unemployed, but discouraged workers are not, as they are classified as inactive.

$$i(g) = \frac{\frac{n_w(g)}{n(g)}}{\frac{n_w(0)}{n(0)}}$$

This coefficient will be larger than 1 when the NWW rate of g is larger than that of the reference group, and vice-versa.

Severity is an index that summarizes the distribution of the NWW in different situations, that we assume ordered from worst to best, for practical reasons (see below). We consider that the worst situation corresponds to those who are discouraged, as they have ceased to look for a job. Next we consider those who are unemployed, according to the standard notion. Unemployed workers are divided into different categories depending on unemployment duration, from longer (more than 48 months) to shorter (less than three months). Finally, the best category corresponds to those with suspended jobs who are pending to return to work while keeping their contracts.

Rather than attaching weights to those categories, in order to assess the severity in terms of a generalized mean, we follow the approach in Herrero & Villar (2020) that does not need doing so and still gives us a cardinal evaluation of the state of each social group under scrutiny. We do so by comparing the probability that a NWW from each social group be in a worse situation than a NWW from the reference one. The higher this probability, the more severe is the situation.⁵

Let us formalise this idea. We want to compare the severity of the NWW of a set of social groups, $g = 1, 2, \dots, G$, in terms of the distributions of their members over an ordered set of categories, $c = 1, 2, \dots, C$. We describe the situation of social group g by a vector $\mathbf{a}(g) = (a_{g1}, a_{g2}, \dots, a_{gC})$, where a_{gc} is the fraction of NWW from group g in category c . That is, we can write $a_{gc} = n_{gc}/n_w(g)$, where n_{gc} is the number of individuals in group g who belong to category c , and $n_w(g)$ is the size of the NWW in g . By construction, $a_{gc} \geq 0$, $\sum_{c=1}^C a_{gc} = 1$, for all g .

To assess the severity of the NWW in those social groups we compare the likelihood of belonging to a worse category for the representative member of each group, relative to that of the reference group, which we shall identify with the subindex 0. To be

⁵ Gastwirth (1975) and Lieberman (1976) introduced the idea of using this type of probability to assess discrimination and segregation.

precise, let $p(g)$ denote the probability that a NWW from group g belongs to a worse category than a NWW from the reference society, group 0. As those categories are ordered from worst to best, such a probability can be easily computed as follows:

$$p(g) = a_{g1}(a_{02} + \dots + a_{0c}) + a_{g2}(a_{03} + \dots + a_{0c}) + \dots + a_{g(c-1)}a_{0c}$$

Let $e(g)$ stand for the probability of a tie, that is, the probability that a NWW from g be in the same category than a NWW from group 0. Now define the variable: $q(g) = p(g) + \frac{1}{2}e(g)$, which correspond to the probability of an individual from g being worse than or equal to one from the reference group, by splitting the probability of a tie evenly. We can think of this variable as a sort of handicap index.⁶

The severity measure of the non-working workers in group g is given by:⁷

$$s(g) = \frac{q(g)}{1 - q(g)} \quad [1]$$

That is, $s(g)$ tells us how likely is that a NWW from social group g be in a worse situation than one in group 0, relative to the complementary case. Note that, by construction, $s(0) = 1$. When $s(g) > 1$ we know that the severity of the situation in group g is worse than that of the reference group, and also how much worse (as this is a cardinal measure). This is an increasing and convex function that is equal to 1 when $q(g) = \frac{1}{2}$.

We now define the Non-Working index as:

$$I_{NW}(g) = \frac{\frac{n_w(g)}{n(g)}}{\frac{n_w(0)}{n(0)}} \times \frac{q(g)}{1 - q(g)} \times 100$$

Note that this definition implies that $I_{NW}(0) = 100$. Values above or below 100 indicate worse or better situations relative to the reference group. We also have information on the contribution of incidence and severity to the value of the index. Multiplying by 100 is just a way of facilitating the comparisons, as each value tells us the percentage of the reference group.

⁶ In golf the handicap is a numerical measure of a golfer's potential that is used to compare players relative to a standard (the average number of strokes that a particular field requires). Better players are those with the lowest handicaps.

⁷ If we let $p_g(0)$ denote the probability that a NWW from the reference group be in a worse category than one of group g , and define $q_g(0)$ accordingly, the idea making the scores of severity proportional to the corresponding probability measures. That is, $\frac{s(g)}{s(0)} = \frac{q(g)}{q_g(0)}$. Now, as $q_g(0) = 1 - q(g)$ and the former equation has a degree of freedom, by setting $s(0) = 1$ we get equation [1].

3. The impact of the Covid-19 on the Spanish labour market (2019-2020): An Overview

3.1 The data

We devote this and the next sections to the analysis of the situation and the evolution of the population of non-working workers in Spain between 2019 and 2020. The data come from the Labour Force Survey (“Encuesta de Población Activa”, EPA), that is elaborated quarterly by the Spanish National Statistical Institute (“Instituto Nacional de Estadística”, INE), and is the main source of labour market data in Spain. We take as our reference point the situation of Spain as a whole in the third quarter of 2019, just a few months before the first confinement measures were implemented to fight the spread of the Covid-19. The impact on the labour market of the pandemic is measured by comparing this reference point to the situation 12 months later, the third quarter of 2020.⁸

The analysis we develop here refers to different groups of non-working workers. We first consider the case of the Spanish regions, which show quite a diversity of situations and different dynamics. Next, we deal with the study of different types of workers defined by gender, age, and educational levels.

In order to construct the categories that allow measuring severity, we use information on labour market status joint with some additional variables that help us identify those employees who worked fewer hours than usual due to temporary collective redundancy scheme (ERTE) or partial unemployment. These workers have their contracts suspended due to a technical stop in the firm’s activity, or their working hours reduced upon approval of the ERTE by the employment authority but will continue being

⁸ We deliberately skip the second quarter of 2020 as there are doubts about the nature of those data. The type of question that defines someone as unemployed or outside the labour force is hardly suitable in a situation in which people are confined at home. This inadequacy results in about one million people exiting and re-entering the labour force in a very short period.

considered as employed in the Labour Force Survey. Finally, we also use information on the search activity, availability and willingness to work in order to identify “discouraged workers”, that is, those who have stopped looking for a job because they believe that no work is available for them, and also those who “would like” and are able to work but have not looked for work recently.

Based on this information, we classify non-working workers into different categories, to approach the severity of those population groups. As we mentioned before, we regard discouraged workers as the worst situation of NWW. The time intervals we consider for those unemployed are the following (from worst to best categories): those unemployed for more than 48 months (the worst unemployment case), those between 24 and 48 months (24 months is the upper limit for standard unemployment benefits), those between 12 and 24 months (here is where long-term unemployment ends), those between 6 and 12 months, those between 6 and 3 months, and those unemployed for less than three months (which can be interpreted as frictional unemployment). The best situation among the NWW is that of those with suspended jobs, which might be either full or partial. So, we have nine different categories to classify non-working workers, as described in Table 1.

Table 1: Classification of NWW from worst to best

	Discouraged			Unemployed			Suspended	
	>48 m	48-24 m	24-12 m	12-6 m	6-3 m	< 3 m	Full	Partial
1	2	3	4	5	6	7	8	9

3.2 Overview

Table 2 shows that, between the third quarter of 2019 and that of 2020, Spain has lost 1.6 million employments. About half a million of that figure corresponds to fully suspended jobs, 350,000 correspond to partial job reductions, half a million of new unemployed and some 370,000 discouraged. Unemployment figures exhibit a peculiar pattern: The half a million increase of unemployed is made of an increase of 570,000 short term unemployed and a reduction of some 70,000 long-term unemployed. This reduction corresponds basically to people unemployed for more than 48 months, who join the group of discouraged workers. The pandemic has, therefore, induced a crowding out

effect on the long-term unemployed by worsening their expectations and inducing some of them to leave the conventional labour force. These figures make also clear that computing or not the discouraged workers changes substantially our perception of unemployment.

Table 2: Changes in the labour market in Spain between the third quarter of 2019 and the third quarter of 2020

	INACTIVE		UNEMPLOYED		WITH A JOB		Total	
	Other	Discouraged	Shor-term	Long-term	Full Suspension	Partial Suspension		Employed
Q3 2019	6,832,501	763,781	1,751,820	1,451,727	12,151	14,327	19,627,184	30,453,491
Q3 2020	6,839,283	1,134,809	2,323,862	1,384,137	508,514	367,318	18,050,576	30,608,499
Variation	0,10%	48,58%	32,65%	-4,66%	4085%	2464%	-8,03%	0,51%
Variation (abs)	6.782	371.027	572.043	-67.590	496.363	352.991	-1.576.608	155.008

These data suggest that the incidence is going to increase substantially whereas severity will experience a reduction, due to the sharper increment in the share of the NWW in the best categories (suspended jobs, either partially or in full) relative to the worst one (the discouraged). This is indeed the case. As shown in the first row of Tables 3 and 4, between the third quarter of 2019 and that of 2020 the incidence of the NWW has increased about 42% whereas the severity has declined by 24%. As a result, the Non-Working index for Spain in the third quarter of 2020 is about 8% higher than that in the previous year.

Those global results, though, are not very informative because there are large differences in the observed behaviour when we consider the outcomes by regions and types of workers, as we shall see next. Before doing so it is interesting to compare the change experienced in the labour marker between Q3 2019 and Q3 2020, with that experienced in the same quarters of 2008 and 2009. In this period the financial crisis produced a slightly higher level of NWW (1.8 million rather than 1.6) so that the incidence was 50% higher in 2009 relative to 2008 (against 42% in 2020 with respect to 2019). Yet the greatest difference refers to severity. Whereas severity went down by 24% between 2019 and 2020, it increased by more than 12% between 2008 and 2009. As a result, the increase of the Non-working index between 2008 and 2009 was more than 60%, instead of the modest 8% between 2019 and 2020. This difference provides a measure of the buffering effect of the ERTES.

4. The autonomous regions

We now discuss the situation of the NWW in the Spanish autonomous regions in the third quarter of 2019 (Q3 2019) and that of 2020 (Q3 2020).⁹ Table 3 provides the summary data. The first thing to note is the variety of situations and the different dynamics between the regions. The coefficient of variation (CV) shows that incidence presents a much larger variability than severity and that both have evolved differently. The CV of severity has increased by 40 % whereas that of incidence has decreased by 24%. Asturias, Extremadura and País Vasco are the regions with worse severity scores in Q3 2019 (Balears and Catalunya are those with better values), whereas Andalucía, Canarias and Extremadura are those with higher incidence (Aragón, Balears and Rioja those with smaller).

Incidence in Q3 2020 was more than 40% higher in Spain with respect to Q3 2019, with an extraordinary peak in Balears and values substantially above the mean in Catalunya, Madrid, Aragón, Canarias and Rioja. Note that, Balears and Canarias are those regions with higher dependence on tourism, whereas the other regions are those where the pandemic has hit harder in the second wave. The regions with better outcomes regarding the evolution of incidence are Asturias, Extremadura, Andalucía and Murcia, regions with a relatively smaller impact of the Covid-19 but also with higher initial values in the NWW index.

Severity, as anticipated above, has improved in 2020 given the relevance of the workers with suspended jobs. Spain exhibits a 24% reduction of this variable whereas Cantabria and Madrid present much better values. Andalucía and Navarra are the regions with smaller improvements.

⁹ We do not include the cities of Ceuta and Melilla both because they are not regarded as regions, represent a tiny part of the total population, and because their idiosyncratic nature makes comparisons hard to interpret.

**Table 3: Incidence, severity and NWW Index in the Spanish Regions
(Q3 2019 and Q3 2020)**

	SEVERITY			INCIDENCE		
	Q3 2019	Q3 2020	Variation	Q3 2019	Q3 2020	Varation
Spain	1.0000	0.7578	-24.22%	0.1691	0.2406	42.29%
Andalucía	1.0298	0.9089	-11.74%	0.2612	0.3197	22.42%
Aragón	0.9895	0.7366	-25.56%	0.1159	0.1857	60.20%
Asturias	1.2589	0.9115	-27.59%	0.1789	0.2131	19.09%
Baleares	0.8141	0.3855	-52.64%	0.0996	0.2731	174.08%
Canarias	0.9122	0.6902	-24.34%	0.2346	0.3744	59.59%
Cantabria	1.1487	0.7376	-35.79%	0.1257	0.1842	46.54%
CastLeon	1.0762	0.8956	-16.79%	0.1405	0.1903	35.38%
CastMancha	1.0883	0.9260	-14.91%	0.1944	0.2474	27.26%
Catalunya	0.7699	0.6004	-22.02%	0.1228	0.2060	67.70%
Valencia	0.9916	0.7751	-21.84%	0.1716	0.2461	43.46%
Extremadura	1.2479	0.9671	-22.50%	0.2445	0.2927	19.71%
Galicia	1.0502	0.8034	-23.50%	0.1436	0.1836	27.83%
Madrid	1.0593	0.6664	-37.09%	0.1287	0.2079	61.58%
Murcia	0.9814	0.7271	-25.91%	0.1785	0.2303	29.04%
Navarra	0.9012	0.7539	-16.34%	0.1061	0.1611	51.84%
PaisVasco	1.1659	0.8245	-29.28%	0.1289	0.1746	35.38%
Rioja	0.9417	0.7562	-19.70%	0.1180	0.1841	56.11%
CV	0.129	0.179		0.307	0.248	

Table 4 provides the data of the Non-Working index for those two quarters. The variability of the index is very high (a CV above 0.3 in both periods), even though it has decreased by some 15%. Andalucía and Extremadura are the regions with higher values of the index in Q3 2019 (well above 50% higher than the average), followed by Asturias, Canarias and Castilla la Mancha. On the opposite side we find Baleares, Catalunya, Navarra and Rioja.

The dynamics of severity and incidence shows that regions have followed different patterns. Spain as a whole shows an increase of about 8% in the Non-Working index. Much higher increments have experienced Aragón (due to a larger increment in incidence), Baleares (which experiences a reduction in severity higher than the mean but a much larger increase in incidence), Canarias (due to a larger increase in incidence), Catalunya (same reason), Navarra (due to a smaller reduction of severity and a larger increase in incidence) and Rioja (a smaller reduction of severity and a larger increase in

incidence).¹⁰ The regions with relative better evolution are Asturias (due to a smaller increase in incidence), Cantabria (due to a larger reduction of severity), Extremadura, (smaller increase in incidence), Galicia (same reason), Murcia (same reason), and País Vasco (due to a larger reduction of severity and smaller increase in incidence)

**Table 4: Non-Working index in the Spanish Regions
(Q3 2019 and Q3 2020)**

	Q3 2019	Q3 2020	Variation
Spain	100.0	107.8	7.81%
Andalucía	159.0	171.9	8.05%
Aragón	67.8	80.9	19.26%
Asturias	133.2	114.9	-13.77%
Baleares	48.0	62.3	29.80%
Canarias	126.5	152.8	20.74%
Cantabria	85.4	80.3	-5.90%
CastLeon	89.4	100.8	12.66%
CastMancha	125.1	135.5	8.28%
Catalunya	55.9	73.1	30.77%
Valencia	100.6	112.8	12.13%
Extremadura	180.4	167.4	-7.23%
Galicia	89.2	87.2	-2.21%
Madrid	80.6	81.9	1.65%
Murcia	103.6	99.0	-4.39%
Navarra	56.6	71.8	27.03%
PaisVasco	88.9	85.1	-4.26%
Rioja	65.7	82.3	25.36%
CV	0.369	0.320	

¹⁰ It is worth mentioning that Baleares and Navarra have also experienced an increase in the share of population outside the labour force (inactive population) much higher than the average (8,2% in Baleares, 5,75% in Navarra, and 0,1% in Spain).

5. Types of workers

We devote this section to the study of the differences between types of workers according to three different aspects: gender (two subgroups), age (five subgroups) and level of education (five subgroups).

5.1. Gender

Gender differences in NWW present a familiar pattern when analysing unemployment, as shown in Table 5. On the one hand, we observe that women are worse off than men both regarding severity and incidence in the two periods considered. On the other hand, the increase of the incidence is larger for men than for women (with a rather similar change in severity).

Table 5: Severity and incidence by gender (Spain Q3 2019 and Q3 2020)

	SEVERITY			INCIDENCE		
	2019	2020	Variation	2019	2020	Variation
Men	0.8873	0.6718	-24.29%	0.8490	1.2416	46.23%
Women	1.1019	0.7621	-23.79%	1.1688	1.6239	38.94%
Total	1.0000	0.7578	-24.22%	1.0000	1.4229	42.29%

The combined effect of those two variables appears in Table 6 where we present the Non-Working index. Women were some 29% worse than the average in 2019 and that figure has been reduced in five percentual points in 2020. Men, on the contrary, are 11% worse in 2020.

Non-Working index by gender

	2019	2020	Variation
Men	75.34	83.41	10.72%
Women	128.80	123.76	-3.91%
Total	100.00	107.83	7.83%

5.2. Age groups

We proceed now to analyse the situation and the dynamics of the labour market, conditional on age. We consider five age groups that gather the labour force in ten-year intervals.

Table 7 presents the data on severity and incidence in the two quarters, as well as their rates of change. The most striking feature is the sharp contrast of the dynamics

experienced by the youngest and the oldest workers. In the third quarter of 2019 the severity index of the youngest NWW was slightly above half of the average value, whereas the oldest group exhibited a value 70% higher than the mean. In the third quarter of 2020 severity of the youngest group is above the mean, having increased by 50%, while that of the oldest group is still above the mean, but went down by more than 30%.

Regarding the incidence, the youngest group of NWW shows a value more than twice the average in both periods, having increased slightly less than the average. The oldest group had an incidence equal to the mean in 2019 and smaller than the mean in 2020 (an increase of 27% respect to 42% for the mean value).

Table 7: Severity and incidence of the Non-Working Workers by age (Q3 2019 and Q3 2020)

	SEVERITY			INCIDENCE		
	Q3 2019	Q3 2020	Variation	Q3 2019	Q3 2020	Variation
16-25	0.5540	0.8308	49.96%	2.2053	3.0199	36.94%
26-35	0.7902	0.6357	-19.55%	1.0926	1.6384	49.96%
36-45	0.9346	0.6304	-32.55%	0.7741	1.1798	52.41%
46-55	1.1227	0.7325	-34.75%	0.8224	1.1632	41.44%
56-65	1.7215	1.1805	-31.42%	1.0119	1.2853	27.02%
Total	1.0000	0.7578	-24.22%	1.0000	1.4229	42.29%
CV	0.385	0.253		0.445	0.424	

The Non-Working index combines the features that Table 8 presents and provides a summary measure of the situation. In the first quarter of 2019 the youngest and the oldest NWW had an index higher than the average (22% and 74%, respectively). All other age groups were below the mean. One year later the situation has changed substantially. The youngest and the oldest groups are still above the mean, but the index for the youngest has doubled whereas that for the oldest group shrank by 13% (the average having increased by some 8%). The situation of the young has worsened drastically while that of the oldest group has improved relatively to the other age groups.

Table 8: The Non-Working Index by age (Q3 2019 and Q3 2020)

	Q3 2019	Q3 2020	Variation
16-25	122.18	250.90	105.36%
26-35	86.33	104.16	20.64%
36-45	72.35	74.37	2.80%
46-55	92.33	85.20	-7.71%
56-65	174.19	151.73	-12.89%
Total	100	107.83	7.83%
CV	0.331	0.484	

Table 9 provides the data on the evolution of the key variables that help understanding the values of the indicators presented above. Occupation among the youngest NWW has decreased by 22% (a reduction of 8% for the whole population), whereas the number of older workers occupied has increased slightly. The average increase of discouraged workers is around 49% whereas for the youngest arrives at 75% (and only at 30% for the oldest). Besides, the “other inactive” group has increased by 4,5% for the youngest (0.1% for whole population) and has decreased by 4% for the oldest. Note that suspended jobs have increased twice for the youngest than for the average, which means that those indicators point out that the situation of this age group is much more fragile than that the rest. Even if it is not clear how things will evolve when the ERTes end, the structure of the labour market and past experience anticipate that the increase in unemployment will be biased against the young.

Table 9: Evolution of the main variables in the job market by age groups (Spain Q3 2020 relative to Q3 2019)

	Other inactive	Discouraged	Long-term unemp.	Short-term unemp.	Suspended	Occupied	Total
16-25	4.47%	74.69%	0.22%	24.37%	6413%	-22.34%	2.33%
26-35	-0.90%	54.76%	-0.09%	44.91%	2892%	-11.68%	-0.46%
36-45	-1.45%	51.65%	-6.09%	28.74%	4479%	-10.20%	-2.41%
46-55	0.50%	42.27%	-10.97%	35.10%	2600%	-5.53%	1.15%
56-65	-4.08%	30.35%	-1.04%	23.22%	2861%	0.60%	2.78%
Total	0.10%	48.58%	-4.66%	32.65%	3208%	-8.03%	0.51%

5.3. Education

Comparing the situation of the NWW by education levels and the changes experienced during the last year does not yield much surprise, as described in Table 10. Here again

we find that the variability of severity is much smaller than that of incidence, and both move in opposite directions.

The NWW with lower educational levels are well above the mean in severity and incidence in both periods. Severity was 25% higher than the mean in 2019 and jumped up to more than 39% in 2020. Incidence was twice the mean in 2019 but increased about one half of the mean increment in 2020 (a value of 1.67 times the new mean). The NWW with compulsory education show a similar pattern, with smaller differences with the mean.

The values of severity for those NWW with secondary education are around the mean in both periods (better those with a professional orientation, relative to those with a general profile, in 2019, and worse in 2020). Incidence is also close to the mean even though those with a general profile have experienced a much larger increase.

The NWW with tertiary education present much better data than the average in both periods and for the two variables (severity and incidence). Severity has decreased more than the average and moved from 87% of the mean in 2019 to 76% in 2020. Incidence, on the contrary, has increased more than the average so that it changed from 63% of the mean in 2019 to 71% in 2020.

Table 10: Severity and incidence of the Non-Working Workers by education (Q3 2019 and Q3 2020)

	SEVERITY			INCIDENCE		
	2019	2020	Variation	2019	2020	Variation
Primary or less	1.2464	1.0621	-14.79%	1.9582	2.3725	21.16%
Compulsory	1.0631	0.8702	-18.15%	1.3017	1.7646	35.57%
Secondary general	0.9706	0.7309	-24.70%	1.0206	1.6213	58.85%
Secondary professional	0.8986	0.7746	-13.80%	0.9940	1.3735	38.17%
Tertiary	0.8720	0.5830	-33.14%	0.6327	1.0146	60.36%
Total	1.0000	0.7578	-24.22%	1.0000	1.4229	42.29%
CV	0.134	0.197		0,375	0,276	

Table 11 provides the data of the Non-Working index, which show a perfectly monotone pattern (the higher the educational level, the smaller the index) and a very large range of variation. Those with lower educational levels present much higher values of the index in 2019 and 2020, more than twice the mean for those with primary education or less. On the other extreme, NWW with tertiary education have an index slightly above one half of the mean in both periods. Note also that the larger changes occur for those with secondary studies.

Table 11: The Non-Working Index by education (Q3 2019 and Q3 2020)

	2019	2020	Variation
Primary or less	244.08	251.98	3.24%
Comp	138.38	153.56	10.97%
Second G	99.07	118.49	19.61%
Second P	89.33	106.39	19.11%
Tertiary	55.17	59.15	7.22%
Total	100.00	107.83	7.83%
CV	0.520	0.468	

5.4. The old and the young by educational levels

Educational levels and age groups are far from being independent features in the population, particularly regarding the NWW. On the one hand, Spain has experienced a sharp increase in educational levels during the last decades so that the younger generations exhibit a much larger share of people with tertiary studies. Complementarily, the older the generation the larger the share of people with lower levels of studies. On the other hand, the structure of the labour market is very asymmetric between the old and the young. The young have much higher unemployment rates but mostly short term and those employed are commonly with temporary contracts (which also means much cheaper firing costs). The older the generation the larger the share of permanent contracts and the smaller the unemployment rates (see the data on incidence in Table 7); yet they also have the larger share of long term unemployed. Those features, though, differ within age groups depending on educational levels. We describe here the situation of the population subgroups that we get when applying both age and education divisions simultaneously, focusing on the oldest and the youngest cohorts in our sample. We use here the following convention to denote educational levels: L1 for Primary or less, L2 for Compulsory, L3 for Secondary General, L4 for Secondary Professional, and L5 for Tertiary.

In 2019 all the young exhibit severity values below average and smaller the higher the educational level. Severity in the oldest cohort, on the contrary, is well above the mean in 2019 and shows the same decreasing pattern by educational levels. In 2020 things are rather different. All the young worsened their situation regarding severity, especially those with professional secondary studies (37% increase with respect to a reduction for the average of about 24%). The old have improved with a monotonous pattern regarding education. The coefficient of variation for the young was 0.20 in 2019 and went down to

0.18 in 2020. The CV for the old was 0.08 in 2019, an extremely low value, and has climbed up to 0.14 in 2020.

Incidence behaves somehow in the opposite way. In 2019 all the young, except those with general secondary schooling were above the mean (including those with tertiary studies, whose incidence was more than 60% higher than the Spanish value). Incidence among the oldest generation was slightly above the mean for those with lower levels of education and well below for those with secondary and tertiary studies (those with tertiary studies exhibited a value of one half of the mean). Incidence has increased less than the average for all groups except for the oldest workers with university studies. The pattern is common for old and young: the higher the education the higher the increase (note that those with professional secondary studies do slightly better than those with general secondary studies). The coefficient of variation was 0.27 for the young and 0.24 for the old in 2019, going down to 0.24 and 0.18, respectively, in 2020.

Table 12: Severity and incidence for the young and the old by education and age (Q3 2019 and Q3 2020)

Age	Edu	Severity			Incidence		
		2019	2020	Variation	2019	2020	Variation
16-25	L1	0.9419	1.0172	7.99%	2.009	2.239	11.46%
	L2	0.8106	0.9153	12.92%	1.157	1.537	32.82%
	L3	0.8144	0.8990	10.40%	0.887	1.220	37.50%
	L4	0.6024	0.8275	37.36%	1.738	2.338	34.51%
	L5	0.5348	0.5926	10.81%	1.624	2.263	39.37%
56-65	L1	1.9125	1.4371	-24.86%	1.069	1.326	24.03%
	L2	1.7571	1.2462	-29.08%	1.010	1.300	28.71%
	L3	1.6157	1.1447	-29.16%	0.756	1.052	39.07%
	L4	1.6185	1.0994	-32.07%	0.898	1.163	29.49%
	L5	1.5384	0.9501	-38.24%	0.509	0.784	53.88%
	Total	1	0.7577	-24.23%	1	1.425	42.46%

Table 13 provides the Non-Working index for those population subgroups. The most salient feature in those data is that all the population subgroups in the youngest cohort worsen their situation, whereas all in the oldest improve in 2020 relative to 2019. Also note that those with professional secondary studies are those who suffer the highest deterioration among the young (actually among all population subgroups of this nature), and those with the highest improvement among the old (among all population subgroups except for those between 46 and 55 with tertiary studies, who have a slightly larger reduction). This pattern might be linked with the increasing share of people with tertiary studies (including those professionally oriented).

Table 13: The Non-Working Index for the young and the old by education and age (Q3 2019 and Q3 2020)

Age group	Education	2019	2020	Variation
16-25	L1	189.19	227.71	20.36%
	L2	93.83	140.72	49.98%
	L3	72.23	109.65	51.80%
	L4	104.73	193.51	84.77%
	L5	86.83	134.10	54.44%
56-65	L1	204.47	190.56	-6.80%
	L2	177.48	162.02	-8.71%
	L3	122.17	120.36	-1.48%
	L4	145.41	127.90	-12.04%
	L5	78.33	74.44	-4.97%
	Total	100.00	107.98	7.95%

It is interesting to complete this analysis by observing what has happened with the number of people employed, the working workers, along this year. The data in Table 14 show that the youngest with lower levels of education have experienced a 35% reduction in their occupational level, whereas the mean reduction in the sample is 8%. In the older generation we also observe a sharp reduction of employment in those with the lowest level of studies, a small reduction in those with compulsory education, and an increase in those with secondary and tertiary studies. Those data are still more worrisome when we observe the dynamics of the working age population. Those with the lowest level of studies keep shrinking whereas those with secondary and tertiary studies grow.

Table 14: Change in occupation and working age population. Old and young by education levels (Spain Q3 2020 relative to Q3 2019)

	Education	Working workers	Working age population
16-25	L1	-40.63%	-12.14%
	L2	-34.86%	-1.66%
	L3	-21.20%	7.55%
	L4	-14.10%	3.58%
	L5	-11.09%	5.31%
56-65	L1	-21.90%	-16.97%
	L2	-4.30%	3.42%
	L3	3.65%	5.28%
	L4	10.49%	16.64%
	L5	8.25%	9.50%
	Total	-8.03%	0.51%

6. Concluding Remarks

We have proposed here a protocol to measure the impact of Covid-19 on the labour market based in a synthetic indicator that combines incidence and severity. This is a standard way of assessing the impact of a given phenomenon on a population. The methodological novelty is twofold. On the one hand, we use an extended notion of people that are not working (the non-working workers), that computes unemployed, discouraged and those workers with their jobs suspended. On the other hand, severity is obtained by comparing the distributions of NWW over a set of categories that takes into account unemployment duration, discouraged workers and workers with suspended jobs. The result is the Non-Working index.

We have applied this methodology to the analysis of the impact of the Covid-19 in the Spanish labour market. Between the third quarter of 2019 and that of 2020 1.6 million works have been lost due to unemployment (about 500,000), discouraged workers (371,000) and suspended jobs (some 850,000). Those data reflect that incidence among the non-working workers has increased by more than 40% whereas the severity has decreased by 24% during this period, due to the effect of suspended jobs. This results in an increase of the Non-Working index of about 8%.

The impact of the epidemics on the job market has been very asymmetric by regions and types of workers. By setting to 100 the Non-working index for Spain in the third quarter of 2019 we find that one year later this index arrived to 171 for Andalucía, 167 for Extremadura or 152 for Canarias. In the other side of the spectrum are Navarra (72), Catalunya (73), Madrid (82), Rioja (82) and País Vasco (85). The dynamics of this indicator, though, shows that the larger increments have occurred among the regions with lower initial values, so that the variability is now smaller.

Regarding gender, the observed differences mostly repeat what was already seen in the former crisis: women have a higher than men Non-Working index in both periods, even though the difference between them shrank (form 54 to 41 percent points).

Differences by age and education are much larger than those by gender. The youngest and the oldest cohorts of NWW exhibit the highest values of the index in both periods, yet with an opposite motion. The youngest increased the index from 122 in 2019 to 251 in

2020, whereas the oldest went from 174 to 152. Differences by education are even sharper and have not changed much. The value of the Non-Working index is smaller the higher the education achieved, ranging from 244 to 55 in 2019 and from 251 to 59 in 2020. The more disaggregated analysis of the young and the old shows that all the population subgroups within the youngest cohort get worse results in 2020 relative to 2019 whereas all population subgroups of the oldest improve.

Once more the young (and among them the less educated) are the population subgroups that suffer more intensely the impact of the economic crisis. The relevance of this phenomenon should not be under-estimated, even if this collective is the smallest among the age groups considered (about four million people) and are not very visible, as they are not socially organised, their unemployment spells are relatively short, and they might have the support of their families. Yet, there is increasing evidence that the first steps in the labour market may have long term consequences. The recent survey by von Wachter (2020) on this topic shows that entering the labour market during a recession has long-term effects on wages (a reduction of 10% to 15%, more for those with lower education). Moreover, adverse conditions in early stages of the job might be “disruptive beyond strictly economic outcomes... Adverse labour market entry has effects on health and other outcomes like marriage, divorce, and women’s fertility and can affect socio-economic outcomes, health, and mortality in middle age” (Ibid. p. 169). There exists already some evidence that this is indeed the case for Spain (García Pérez & Vall Castelló, 2015 or García Pérez et al., 2019) which is usually viewed as a result of the extremely dual nature of the employment protection legislation that epitomizes its labour market since early eighties in the last century.

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