Employment Protection by Job Retention Schemes in a Segmented Labor Market

Raquel Carrasco (UC3M), Virginia Hernanz (Universidad de Alcalá), and Juan Francisco Jimeno (Banco de España, Universidad de Alcalá, CEMFI, CEPR and IZA)

June 2024

PRELIMINARY AND INCOMPLETE. PLEASE DO NOT CIRCULATE

Abstract:

We examine the effects of Job Retention Schemes (JRS) on the employment status and wages of permanent and temporary workers in the short and medium term during the COVID-19 crisis in Spain. Traditionally, labor market adjustments in Spain have relied on changes in temporary employment, while permanent workers have enjoyed greater job stability due to strict firing regulations. The main policy response to the COVID-19 crisis was the extension of JRS across sectors, occupations, and for the first time, to temporary workers. Using data from administrative records, our analysis reveals that, while the protection offered by JRS did not entirely bridge the gap with permanent workers, it did provide temporary workers with higher employment probabilities and wage gains after the crisis compared to similar workers pushed into unemployment.

Keywords: H20, J20, J65

JEL Codes: Job retention schemes, employment, wages, COVID-19

_____

The Spanish labour market is characterized by a sharp division between "stable" employment -permanent positions with high firing costs- and "atypical" employment - temporary contracts with less strict and less costly firing rules. (Polavieja, 2003; Hernanz and Jimeno, 2013). Reducing temporary employment has been the main way of adjusting the labour force after economic shocks since the early 1980s when temporary contracts were introduced. This is illustrated by the higher volatility of temporary employment between 2008 and 2021, as shown in Figure A1. Temporary workers are also more likely to move from employment to unemployment, highlighting the precarious nature of these jobs.

Although the COVID-19 pandemic was a widespread shock that hit the entire economy, vulnerable workers experienced the most severe economic impacts (Cortes and Forsythe, 2023). These vulnerable workers include temporary workers, who accounted for 25% of those employed in Spain when COVID-19 was declared.

Like many other countries, Spain's main employment policy response to the COVID-19 shock was to significantly expand Job Retention Schemes (JRS) (Jimeno, 2021; OECD, 2020). These schemes, common in countries with strict employment protection legislation (Boeri and Bruecker, 2011) and already existing in Spain before 2019, provided an alternative to large-scale layoffs and collective dismissals. JRS allowed firms to retain their workforce, avoiding the costs associated with recruiting and training new employees once the economy recovered. They also allowed for a rapid increase in production and working hours as economic conditions improved, which was particularly valuable during the COVID-19 shock. There are, however, potential downsides to the JRS, as these

schemes can sometimes impede the necessary movement of labour, which may slow down the economic recovery in the long term.

One novel feature of JRS during the COVID-19 crisis in Spain was the effective extension of coverage to temporary employees. Although temporary employees were, in principle, eligible to participate in JRS, the institutional framework strongly limited their effective participation, as firms could rescind their contracts at a much lower cost. For instance, during the 2009-2012 crisis, the incidence of JRS among temporary workers was only 0.09%. By April 2020, over 3.5 million workers, including 750,000 temporary employees, benefited from JRS. Although still significant, the number of beneficiaries decreased to approximately 800,000 by December 2020, with temporary employees comprising 10% of this total. By the end of December 2021, the number further declined to around 350,000, with temporary employees comprising less than 3% of the total beneficiaries (see Figure A2).

This episode provides an opportunity to analyze the impact of the JRS on the subsequent employment status and wages of workers with different types of employment contracts, both temporary and permanent. Specifically, we examine whether these schemes have contributed to reducing labor market segmentation by providing similar levels of employment protection to both permanent and temporary workers covered by the JRS. Using longitudinal administrative data from February 2020 to December 2021, we estimate the impact of JRS on employment transitions and wage growth for temporary and permanent workers during this period.

Several studies have examined the impact of government support initiatives implemented during the early stages of the COVID-19 pandemic. These initiatives include JRS in European countries (Basso et al., 2023; Carrillo-Tudela et al., 2023), the US Paycheck Protection Program (Autor et al., 2022; Bartik et al., 2020; Chetty et al., 2020), and the Australian Jobkeeper program (Bishop et al., 2020), among others. Cross-country analyses suggest that wage subsidies have been associated with smaller increases in unemployment rates. Recent research on Germany (Bellman et al., 2023) highlights the role of JRS in preventing involuntary layoffs, particularly when combined with remote working arrangements. Moreover, the interplay between unemployment insurance and JRS addresses various labor market risks, behavioral margins, and fiscal spillovers (Giupponi et al., 2022).

In related research on Spain, Izquierdo et al. (2021) use Labor Force Survey (LFS) microdata to examine workers' return to work after participating in JRS during the first half of 2020. Their results show that JRS participants were more likely to return to work than those who experienced a job loss. Similarly, using LFS data, Díaz et al. (2023) showed how JRS helped stabilize unemployment rates in sectors impacted by the pandemic. However, they also pointed out disadvantages such as the excessive retention of workers and the slowness of the outplacement process. In a broader economic context, Garcia-Serrano (2022) reports a decline in the employment rate and a rise in the unemployment rate from the fourth quarter of 2019 to the third quarter of 2020, followed by a recovery to pre-pandemic levels by the end of 2021. Additionally, Osuna and García-Pérez (2023) estimate counterfactual scenarios, suggesting a potential unemployment rate of 41.9% if extensive measures such as layoffs were the only response to the crisis.

However, it's important to note that most of these findings are limited by endogeneity biases and the relatively low frequency of LFS data.

Our contribution is threefold. First, we analyze the impact of JRS on the employment status and wages of covered workers using more detailed and richer data from administrative records than in previous studies. Second, we consider the characteristics of the employment contracts of JRS participants (permanent versus temporary contracts). This distinction highlights how JRS may contribute to job stability, labor reallocation, and wage promotion when employment protection legislation (EPL) differs. Third, our results also consider how reducing labour market segmentation, for instance by making EPL uniform across workers by extending JRS coverage to temporary workers, changes labour market transitions and wage prospects for workers in different labour market segments. We find that, while JRS protection did not fully close the gap between permanent and temporary workers, it did provide higher employment probabilities and wage gains also for temporary workers after the crisis.

Institutional Framework and Data

Regulation of External and Internal Labor Market Flexibility in Spain

Since the early 1980s, Spanish EPL has distinguished between two distinct segments of the labour market: stable permanent contracts -the primary segment - and flexible but precarious temporary arrangements -the secondary segment. Temporary workers faced a higher risk of unemployment, unstable career paths (Amuedo, 2000), and considerable wage fluctuations, resulting in significant wage differentials compared to permanent workers (Bentolila and Dolado, 1994, De la Rica, 2003). In contrast, permanent contracts offer job stability, higher wages, more favourable employment rights, career development, and greater union cover. These contracts are more common in larger, more productive firms and are typically held by highly skilled workers (Güell and Petrongolo, 2007). In contrast, temporary contracts, originally designed as a stepping stone to regular employment, are often used to reduce labour costs. By 2022, temporary workers accounted for more than 90% of new hires in Spain.

Since the early 1990s, labour market reforms have aimed to promote job stability in both the primary and secondary segments of the labour market by increasing internal flexibility within firms and reducing labour market duality (Osuna and Garcia-Perez, 2022). However, contrary to these objectives, the reforms implemented in 2010 and 2012 led to an increase in the turnover rate of temporary workers (Cardenas et al., 2021). Thus, from 1984 to 2019, the Spanish labour market showed considerable external flexibility provided by temporary work, alongside strict employment protection for workers with permanent contracts, making Spain a prominent example of a dual labour market (Bentolila, Dolado, and Jimeno, 2020).

On 12 March 2020, the Spanish government introduced a wide set of measures to mitigate the effects of the COVID-19 crisis, ratified by four Royal Decrees (RDL 7/2020, RDL 8/2020, RDL 11/2020, and RDL 15/2020). These measures focused on bolstering healthcare, preserving employment, providing financial support to viable businesses, and assisting vulnerable households. An exemption from employers' social security

contributions was also introduced, with a full exemption for small enterprises and a 75% exemption for larger enterprises. Subsequently, in April 2020, the scope of JRS was expanded to cover companies in key sectors, even in unaffected areas of the economy. In recognition of the worsening impact on the labor market, Royal Decree-Law 18/2020 extended the application of the JRS beyond the state of alarm, initially until 30 June. This extension was further extended by Royal Decree-Law 30/2020 until 31 January 2021. These amendments made it possible to include temporary workers in the JRS for the first time, which was an important step in narrowing the gap in employment protection legislation between permanent and temporary workers.

Employers could use JRS to either suspend employment contracts or reduce working hours, citing reasons such as economic downturn, technological change, organizational restructuring, or unforeseeable events (force majeure) that prevented the fulfillment of the employment contract. Before the pandemic, economic causes included actual or expected losses and permanent reductions in sales or revenues, while technological and organizational causes encompassed changes in production methods and systems. The implementation of JRS involved a stringent administrative process: the employer had to notify the labor administration and negotiate with the workers' representatives. Training to improve employability was promoted during suspensions or reduced working hours. Wages were adjusted accordingly, with workers receiving unemployment benefits covering 70% of the wage reduction. Entitlement to unemployment benefits (contributory system) during JRS is reduced proportionately. Employers maintained social security contributions for workers under JRS, with possible reductions approved by the labor administration only in cases of force majeure.

Data

We use data from the Continuous Sample of Working Lives (*Muestra Continua de Vidas Laborales*, MCVL hereafter), a longitudinal administrative dataset comprising a 4% representative random sample of all workers affiliated with the Social Security administration. This includes individuals working as employees or self-employed, those receiving a public pension, or those registered as unemployed for at least one day during the year when the sample is extracted. This dataset offers detailed information on individuals' employment and unemployment spells. Moreover, the MCVL allows us to observe spells of JRS participation. It also tracks the subsequent labour market statuses and wages of JRS participants and non-participants.

In this study, we selected all individuals under 65 who were employed with either temporary or permanent contracts in February 2020, just before the onset of the COVID-19 pandemic. We observed their employment status in April 2020, during the peak impact of the pandemic on the Spanish labour market (either employed, covered by JRS, or unemployed). Then, in December 2020 and December 2021, we recorded their employment status and wages. Our final sample consists of 500,208 monthly observations. Among these, 27.9% correspond to temporary workers in April 2020, while 72.1% correspond to permanent employees, whose characteristics are reported in Table 1.

In addition to tracking changes in employment status and wages, we also have information about transitions to other firms. Among those employed in February 2020,

24.1 % had moved to a different firm by December 2021; notably this percentage nearly doubled among individuals with temporary contracts. Of those who moved to another firm, 28.7% reported that they did so voluntarily. We, therefore, include firm change as a covariate, alongside demographic and occupational variables and duration of JRS participation, in our models assessing the impact of JRS participation on employment status and wages.

Methods and Results

Our study focuses on estimating the impact of JRS participation on job transitions and wages for both temporary and permanent workers. To assess this impact, we compare the average estimated probability of being employed (*E=1*) in December 2020 (and December 2021) between temporary workers (*Temp=1*) in February 2020 (immediately before the pandemic began) and covered by JRS in April 2020, and those not covered:

$$\Pr\left(E_{Dec20} = 1 \middle| JRS_{Apr20} = 1, Temp_{Feb20} = 1\right) -$$

$$\Pr(E_{Dec20} = 1 | JRS_{Apr20} = 0, Temp_{Feb20} = 1),$$

as well as the same comparison for permanent employees (*Temp=0*):

$$\Pr\left(E_{Dec20} = 1 \middle| JRS_{Apr20} = 1, Temp_{Feb20} = 0\right) -$$

$$\Pr(E_{Dec20} = 1 | JRS_{Apr20} = 0, Temp_{Feb20} = 0).$$

Thus, by examining the employment impact of JRS for each group of workers, we test the hypothesis that JRS was equally effective at protecting both permanent and temporary employees.

To evaluate the influence of contract status on the effectiveness of JRS in preserving employment, we also analyze the average difference in the probability of being employed in December 2020 (and December 2021) between permanent and temporary employees participating in JRS:

$$\Pr\left(E_{Dec20} = 1 \middle| JRS_{Apr20} = 1, Temp_{Feb20} = 0\right) -$$

$$\Pr(E_{Dec20} = 1 | JRS_{Apr20} = 1, Temp_{Feb20} = 1).$$

To address potential endogeneity issues related to JRS participation, we use the incidence of JRS in the sector where the worker was employed in February 2020 as an instrument for individual JRS participation. Furthermore, we also estimate the wage effects of JRS participation using a similar approach. The following sections provide details on the estimation approach.

JRS and Changes in Employment Status

In Table 1, we present descriptive statistics on transitions from employment to different statuses (employment, unemployment, and JRS participation) by demographic groups between February 2020, just before the onset of the pandemic, and April 2020, during the period of strict confinement measures when JRS use peaked.

First, in April 2020, temporary workers had lower participation in JRS and higher unemployment than permanent workers: 21.3% of temporary workers participated in JRS

in February 2020 and 23% were unemployed in April 2020 (compared to 28.4% and 2.9%, respectively, for permanent workers). Second, the incidence of JRS was higher in sectors with higher female employment, and the transition to unemployment was lower for women, regardless of contract type. Younger age groups (16-29 years) were more likely to move into unemployment and JRS than older age groups (55-65 years). Regarding educational attainment, workers with tertiary education were more likely to remain employed than those with primary or secondary education. While immigrants were more likely to participate in the JRS than natives, they also had higher unemployment rates in April 2020. Notably, workers in the agricultural sector, which was less affected by the restrictions imposed during the pandemic, were more likely to remain employed, while those in the market services sectors were more likely to be covered by the JRS.

The average duration of JRS until December 2020 also differed between temporary and permanent employees: the former had a shorter duration (from 3.8 to 4.8 months until December 2020) compared to permanent employees (from 4.2 to 6.2 months). Moreover, older workers tended to have participated in the JRS for longer. Geographical disparities emerged, particularly in the Canary Islands and the Balearic Islands, where the duration of JRS was three months longer than the average, due to a higher incidence of JRS in the tourism sector, where the closure measures were extended, leading to a more prolonged reduction in economic activity.

Table 1
Descriptive Statistics: Transitions from Employment (February 2020) to other statuses (April 2020)

	From Permanent Employment			From Temporary Employment		
	Empl.-Empl.	Empl.-JRS	Empl.-Unempl.	Empl.-Empl.	Empl.-JRS	Empl.-Unempl.
Total	0.687	0.284	0.029	0.557	0.212	0.230
Male	0.696	0.276	0.029	0.562	0.202	0.236
Female	0.678	0.293	0.029	0.552	0.225	0.223
Age: 16-29	0.558	0.382	0.060	0.477	0.255	0.268
Age: 30-44	0.683	0.289	0.028	0.578	0.206	0.216
Age: 45-54	0.718	0.262	0.020	0.620	0.180	0.200
Age: 55-65	0.735	0.240	0.025	0.639	0.146	0.215
Immigrant	0.588	0.336	0.075	0.496	0.239	0.265
Native	0.697	0.279	0.024	0.569	0.207	0.224
Primary Educ.	0.639	0.325	0.036	0.526	0.215	0.258
Secondary Educ.	0.668	0.306	0.025	0.519	0.247	0.235
Tertiary Educ.	0.793	0.190	0.017	0.693	0.168	0.139
Agriculture	0.940	0.031	0.029	0.813	0.024	0.164
Industry	0.725	0.254	0.021	0.624	0.200	0.176
Construction	0.705	0.255	0.040	0.587	0.149	0.264
Market services	0.644	0.323	0.033	0.456	0.269	0.275
Non-Market services	0.828	0.158	0.014	0.782	0.102	0.116
White Collar (High)	0.868	0.121	0.011	0.850	0.084	0.066

White Collar (Low)	0.732	0.249	0.019	0.571	0.256	0.173
Blue Collar (High)	0.683	0.293	0.025	0.571	0.231	0.198
Blue Collar (Low)	0.608	0.350	0.042	0.498	0.224	0.278
Fulltime	0.714	0.263	0.024	0.613	0.181	0.206
Part-time	0.589	0.363	0.048	0.453	0.271	0.275
Tenure (days)	2,549	2,138	973	445	233	123
Monthly wage	2,466	1,318	2,376	1,512	819	917
Nº Obs.	247,855	102,286	10,394	77,840	29,663	32,170

Impact of JRS on workers' subsequent labour market transitions

We outline our empirical strategy for examining the effect of JRS on subsequent employment status. Specifically, focusing on employees in February 2020, we estimate the impact of JRS participation in April 2020 on their employment status in December 2020 (and December 2021), relative to two different control groups: (i) individuals not covered by JRS in April 2020 (that is, individuals who remained employed or entered unemployment), and (ii) those who became unemployed in April 2020. We allow for a differential effect of JRS for temporary and permanent workers.

We estimate the following binary choice model by Maximum Likelihood (ML):

$$\Pr\left(E_{i,Dec20}=1 \middle| E_{i,Feb20}=1, JRS\_All_i, Temp_i, X_i\right) =$$

$$= \mathrm{F}\left(\beta_0 + \beta_1 JRS\_All_i + \beta_2 Temp_i + \beta_3 JRS\_All_i \times Temp_i + \beta_4 X_i' + \beta_5 Dur_{JRS\,i}\right),$$

where F(.) is the normal cumulative distribution function, $E_{i,Dec20}$ is a binary variable indicating whether individual i is employed in December 2020, JRS_All_i is a binary variable indicating JRS coverage in April 2020 (1 for covered, 0 for non-covered), and $Temp_i$ is a binary variable indicating temporary contract status in February 2020 (1 for temporary, 0 for permanent). We include an interaction between these two variables. The vector X_i. includes covariates such as gender, age, education, region, immigrant status, occupation, qualification, tenure, and part-time employment, all measured in February 2020. Additionally, we include the duration of the JRS between April 2020 and December 2020, Dur_JRS_i, as an additional control.

A similar model is estimated for the control group consisting of individuals who became unemployed in April 2020. In this case, the variable of interest, JRS_U_i, equals 1 if the individual was covered by the JRS in April 2020 and 0 if he or she became unemployed. To analyse the long-term effects of both JRS_All_i and JRS_U_i, we also estimate models examining the impact of JRS on employment status in December 2021.

The main parameters of interest are the average marginal effects (AMEs) of the variables *JRS_All* and *JRS_U*, for temporary and permanent workers. These marginal effects are calculated as the average difference in employment probability between JRS participants and non-participants. Specifically, they are obtained by comparing the employment probabilities in December 2020 (and December 2021) for JRS participants in April 2020 (*JRS_All=1*) with those who either remained employed or entered unemployment (*JRS_All=0*):

$$AME_j = \frac{1}{N}\sum_{i=1}^{N} Pr\left(E_{i,Dec20} = 1 \middle| E_{i,Feb20} = 1, Temp_i = j, X_i, JRS_{All_i} = 1\right) - Pr\left(E_{i,Dec20} = 1 \middle| E_{i,Feb20} = 1, Temp_i = j, X_i, JRS\_All_i = 0\right), \text{ j=1,0.}$$

A similar expression is obtained for JRS participants in April 2020 (*JRS_U=1*) versus those who became unemployed (*JRS_U=0*).

Our study addresses the potential endogeneity of JRS participation, an aspect that earlier research often overlooks. While some studies at the micro level have tackled endogeneity using methods such as instrumental variables using instruments based on firms' pre-crisis JRS experience (Boeri and Bruecker, 2011; Bellman et al., 2015) or propensity score matching (PSM) techniques (Kato and Kodama, 2019), the empirical evidence from these studies is mixed. They report either a small positive effect or no effect at all on employment stabilization or layoff avoidance when controlling for endogeneity.

In our research, we employ a joint maximum likelihood (ML) estimation approach to address the endogeneity of JRS participation. We estimate the employment transition probabilities and JRS participation simultaneously. By estimating these models jointly, the distributional assumptions ensure parameter identification without imposing exclusion restrictions. Nevertheless, to further strengthen the identification, we include a relevant regressor in the JRS participation equation that does not directly affect the employment transition probabilities. In particular, we use the percentage of individuals participating in the JRS within each sector as an instrument for individual JRS participation, averaged across sectors at the 3-digit level. For comparison, we also report estimates assuming the exogeneity of JRS participation.

Tables 2 and 3 display the main results regarding the effect of JRS participation on employment status at the end of 2020 and 2021, respectively. The tables show average predicted employment probabilities for temporary and permanent workers by JRS participation status and comparison group. Additionally, we present the average marginal effects of interest as the corresponding differences in the estimated probabilities for each group and their standard errors[1].

Table 2: Average Predicted Probabilities and AMEs of JRS Participation on Employment Probability in December 2020.

	Without JRS Endogeneity Correction		With JRS Endogeneity Correction	
	From Permanent Empl.	From Temporary Empl.	From Permanent Empl.	From Temporary Empl.
$\Pr(E_{Dec20} = 1 \mid JRS\_All = 1)$	0.904	0.912	0.889	0.889
	(0.0004)	(0.0007)	(0.0009)	(0.002)
$\Pr(E_{Dec20} = 1 \mid JRS\_All = 0)$	0.820	0.722	0.835	0.740
	(0.0007)	(0.001)	(0.0009)	(0.001)
AME of JRS_All	0.083	0.190	0.054	0.148

[1] The full sets of estimation results are avaialbe upon request.

	(0.0008)	(0.001)	(0.002)	(0.003)
$\Pr(E_{Dec20} = 1 \mid JRS\_U = 1)$	0.712	0.783	0.710	0.776
	(0.0009)	(0.001)	(0.001)	(0.002)
$\Pr(E_{Dec20} = 1 \mid JRS\_U = 0)$	0.153	0.380	0.187	0.403
	(0.003)	(0.003)	(0.007)	(0.005)
AME of JRS_U	0.559	0.403	0.523	0.372
	(0.003)	(0.003)	(0.008)	(0.007)

Note: Standard errors between brackets.

Table 3: Average Predicted Probabilities and AMEs of JRS Participation on Employment Probability in December 2021.

	Without JRS Endogeneity Correction		With JRS Endogeneity Correction	
	From Permanent Empl.	From Temporary Empl.	From Permanent Empl.	From Temporary Empl.
$\Pr(E_{Dec21} = 1 \mid JRS\_All = 1)$	0.935	0.912	0.899	0.844
	(0.0006)	(0.001)	(0 .002)	(0.004)
$\Pr(E_{Dec21} = 1 \mid JRS\_All = 0)$	0.918	0.835	0.932	0.853
	(0.0007)	(0 .001)	(0.0007)	(0.001)
AME of JRS_All	0.017	0.077	-0.033	-0.009
	(0.001)	(0.002)	(0 .003)	(0.005)
$\Pr(E_{Dec21} = 1 \mid JRS\_U = 1)$	0.854	0.849	0.851	0.831
	(0.0006)	(0.001)	(0.005)	(0.002)
$\Pr(E_{Dec21} = 1 \mid JRS\_U = 0)$	0.520	0.658	0.616	0.700
	(0.0008)	(0.003)	(0.004)	(0.001)
AME of JRS_U	0.335	0.191	0.235	0.131
	(0.007)	(0.005)	(0.016)	(0 .010)

Note: Standard errors between brackets.

In the short term (December 2020), the marginal effect of JRS, relative to all workers who did not participate (first panel of Tables 2 and 3), is statistically and economically significant for both permanent and temporary employees: in the model addressing the endogeneity of JRS participation, this effect is nearly three times greater for the latter. Specifically, JRC participation increases the probability of employment by 5.4 percentage points (pp) for permanent workers and by 14.8 pp for temporary ones. Thus, while both temporary and permanent workers covered by JRS had better employment outcomes after the pandemic than all workers not covered by JRS programs, the effect is more pronounced for temporary workers. In the longer term (December 2021), the marginal effect of JRS on employment is much smaller, with its significance also declining, and even turning negative when the endogeneity of JRS participation is accounted for. Specifically, the employment probability decreases by 3.3 pp for permanent workers and 0.9 pp for temporary ones. This finding is consistent with previous micro-studies that control for the endogeneity of JRS participation, which report either a small positive impact or no significant effects.

Comparing JRS participation with unemployment (second panel of Tables 2 and 3) allows us to assess the impact of JRS participation compared to the control group of workers who lost their jobs due to the COVID-19 shock. We restrict the comparison group to those workers who become unemployed instead of entering the JRS, as this group is likely to be more similar to the temporary workers who enter the JRS. As expected, in this case, the results reveal a stronger effect for permanent workers, with employment probabilities increasing by 52.3 pp in the short term and 23.5 pp in the long term. For temporary workers, the probabilities increase by 37.2 pp in the short term and 13.1 pp in the long term. While our results show a more positive impact in the short term, consistent with Boeri and Bruecker's (2011) findings that JRS is most effective during severe recessions but less so during economic recoveries, the benefits of JRS participation still emerge as the economy recovers from the COVID-19 shock.

To analyze the differences in the protection provided by JRS between permanent and temporary workers, we compare their average predicted employment probabilities. Specifically, we calculate the difference between the probabilities of employment for permanent and temporary JRS participants for the models with the two different control groups:

$$\frac{1}{\mathrm{N}}\sum_{i=1}^{N} Pr\left(E_{i,Dec20}=1\middle|E_{i,Feb20}=1,X_i,JRS\_j_i=1,Temp_i=0\right)-$$
$$Pr\left(E_{i,Dec20}=1\middle|E_{i,Feb20}=1,X_i,JRS\_j_i=1,Temp_i=1\right),\ \mathrm{j=All,\ U.}$$

Results from Table 2 indicate that, when accounting for JRS participation endogeneity, the level of protection provided by JRS is similar for both temporary and permanent workers when the control group is non-participant (88.9% employment probability in both cases). However, compared to the unemployed, protection is lower for permanent employees than for temporary employees (the probability of being employed stands at 71% for those with a permanent contract, compared with 77.6% for those with a temporary contract).

These comparisons however may be blurred by selection into type of contract. One assumption that helps to identify the effect net of this selection issue, is that selection is orthogonal to JRS participation. In other words, the difference in employment probabilities between permanent and temporary JRS participants was the same as for JRS JRS non-participants. Under this identifying assumption the effect of interest would be expressed as (subindex omitted for simplicity):

$$[\Pr(E_{Dec20}=1|X,JRS=1,Temp=0)-\Pr(E_{Dec20}=1|X,JRS=1,Temp=1)]-$$
$$[\Pr(E_{Dec20}=1|X,JRS=0,Temp=0)-\Pr(E_{Dec20}=1|X,JRS=0,Temp=1)].$$

According to the results reported in the first panel of Table 2, the first term of this double difference is approximately 0, while the second term is about 10 pp. when the estimates are corrected for endogeneity. Thus, participation in the JRS protects temporary workers more than permanent workers in the short run, as their predicted probabilities, net of the selection into temporary employment effect, are about 10 pp higher than those for permanent workers. In the longer term (first panel in Table 3), the positive gap in the employment probabilities of JRS participants in favour of permanent employees arises

again (the employment probability is 5.5 pp. higher for permanent workers). However, netting out the effect of selection into temporary work (the second term of the double difference is 7.9 pp.), again shows that temporary workers seem to be better protected by JRS programs, as their employment probability is about 2.4 pp. higher than for permanent workers.

When the comparison group consists of workers who were unemployed in April 2020 (second panel of Tables 2 and 3), permanent employees benefit more from JRS participation, as the double difference in employment probabilities is 15 pp. in the short run and 10.4 pp. in the long run. This indicates that the JRS provides greater job security for permanent employees, who face a higher risk of job loss without the scheme. This finding is in line with the segmentation of the Spanish labour market, where permanent employees (insiders) typically enjoy higher wages and greater job security. However, during severe economic downturns, these advantages may make it more difficult for them to find a new job once they become unemployed, leading to lower unemployment exit rates among previously permanent employees.

Tables A1a and A1b in the Appendix present results from a sample restricted to workers with less than three years of tenure. This robustness analysis is motivated by the fact that permanent workers with brief tenure are more akin to temporary workers. The findings are consistent with our primary results.

JRS and changes in wages

Beyond its impact on employment outcomes, JRS participation may also affect wages through several channels (Vogtenhuber et al., 2024). First, by preserving jobs during economic downturns, JRS can reduce the pressure on employers to raise wages to attract or retain workers. Second, workers' bargaining power may diminish if they perceive that job security depends upon accepting lower wages. In addition, reduced turnover from JRS participation may decrease competition among workers for available jobs. Furthermore, in a segmented market such as Spain, JRS may have a different impact on the wages of temporary and permanent workers.

While JRS might moderate wage growth for permanent workers due to enhanced job security, temporary workers could experience more favourable wage adjustments as employers seek to retain them in a less stable environment. Therefore, we estimate the impact of JRS on the wages of both permanent and temporary workers and examine its effect on the wage gap between them, using a similar empirical approach to that employed in analyzing employment outcomes.

Table 4 presents an overview of mean real monthly wages (in euros) in February 2020 and the subsequent wage growth following the COVID-19 crisis. Similar to the analysis of employment status, this descriptive analysis focuses on employees in February 2020 and their situation in April 2020. Three different groups are examined: those employed in February 2020 and remained employed in April 2020, those employed in February 2020 but enrolled in JRS in April 2020, and those employed in February 2020 but unemployed in April 2020. Regardless of the employment status, whether permanent or temporary, individuals who remained employed had higher wages. At the onset of the

crisis, JRS participants had higher wages than those who became unemployed in April 2020. The data consistently show that temporary jobs paid less than permanent jobs.

In the aftermath of the crisis, wage growth for permanent employees who remained employed in April 2020 was approximately 3%, while for temporary workers it surged to 8%. Over a more extended period up to December 2021, these growth rates stood at 5% and 13%, respectively. RS participants also enjoyed substantial wage increases, suggesting positive trends in employment conditions and successful reintegration into the labour market, especially for temporary workers. The fact that wage growth was higher for temporary employees is not surprising since typically they are at the early stages of their careers when wage profiles are steeper.

Table 4
Descriptive Statistics: Wages in February 2020 and wage growth

	Mean wages, Feb. 2020		**Wage growth, Dec. 2020**		**Wage growth, Dec.2021**	
Employed in Feb. 2020, and:	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary
Employed in April 2020	2,179.9	1,456.3	3%	8%	5%	13%
JRS in April 2020	1,692.3	1,140.7	2%	6%	5%	16%
Unemployed in April 2020	1,184.2	894.1				

Impact of JRS on wage changes

We estimate the impact of JRS participation in April 2020 on wage growth in December 2020 (and December 2021) among employees in February 2020, relative to two different control groups: (i) individuals not covered by JRS in April 2020, encompassing those who remained employed or transitioned into unemployment, and (ii) those who remained employed in April 2020. Furthermore, we allow for a differential effect of JRS for temporary and permanent workers. To gain deeper insights into the mechanisms driving wage growth, we also allow for a differential effect for employees who remained within the same firm as of February 2020 and those who moved to another firm by December 2020 (or December 2021).

The specification of the wage equation is:

$$\log\left(\frac{wage_{i,Dec20}}{wage_{i,Feb20}}\right) = \gamma_0 + \gamma_1 JRS\_All_i + \gamma_2 Temp_i + \gamma_3 Change_i +$$

$$+\gamma_4 JRS\_All_i \times Temp_i + \gamma_5 JRS\_All_i \times Change_i + \gamma_6 X_i' + \gamma_7 Dur_{JRS_i} + \varepsilon_i,$$

where $wage_i$ represents the monthly wage of individual i, and $Change_i$ is a dummy variable equal to 1 if the individual works in a different firm than in February 2020. A similar model is estimated when the variable JRS is defined for the control group comprising individuals who remained employed in April 2020, JRS_E_i. Additionally, we examine the effect of JRS on wage growth in December 2021.

We account for potential endogeneity in JRS participation through an Instrumental Variables (IV) strategy. Specifically, similarly to the employment status model, we use the percentage of individuals participating in JRS within each sector as an instrument for individual JRS participation, averaged across sectors at the 3-digit level. Additionally, for comparison purposes, we present ordinary least squares (OLS) estimates assuming the exogeneity of JRS participation.

The results concerning the marginal effects of the JRS dummies for the different groups considered are displayed in Table 5

Table 5. Marginal Effect of JRS Participation on Wage Growth

	OLS				IV			
	From Permanent Empl.		From Temporary Empl.		From Permanent Empl.		From Temporary Empl.	
	$\log(\frac{wage_{Dec20}}{wage_{Feb20}})$							
	Same firm	Different firm	Same firm	Different firm	Same firm	Different firm	Same firm	Different firm
JRS_All	0.012	-0.031	-0.028	-0.071	-0.004	0.283	0.052	0.339
	(0.002)	(0.010)	(0.005)	(0.011)	(0.013)	(0.040)	(0.022)	(0.045)
JRS_E	0.01	-0.060	-0.038	-0.110	0.032	0.358	0.103	0.428
	(0.002)	(0.010)	(0.005)	(0.011)	(0.011)	(0.035)	(0.019)	(0.040)
	$\log(\frac{wage_{Dec21}}{wage_{Feb20}})$							
	Same firm	Different firm	Same firm	Different firm	Same firm	Different firm	Same firm	Different firm
JRS_All	-0.0004	-0.022	0.007	-0.015	-0.013	0.052	0.051	0.117
	(0.002)	(0.006)	(0.005)	(0.007)	(0.006)	(0.014)	(0.012)	(0.018)
JRS_E	-0.0006	-0.014	0.013	-0.0005	-0.006	0.051	0.049	0.106
	(0.002)	(0.006)	(0.005)	(0.007)	(0.006)	(0.013)	(0.011)	(0.016)

Note: Standard errors (robust) between brackets

Focusing on the IV results and the impact of participation in JRS on wages in December 2021, we find that a positive effect of JRS participation is estimated for temporary workers, especially those who moved to a different firm during this period. In particular, their relative wage between February 2020 and December 2021 increased by about 5% for non-movers and by about 11% for movers, depending on the control group considered. In the case of permanent employees, the positive effects for JRS participants are concentrated among those who moved to another firm, while we find no statistically significant effect for permanent employees who stayed in the same firm. Regardless of the control group considered, the results are very similar in both cases.

These results suggest a positive but differentiated effect of participation in the JRS on workers' wages, depending on the type of contract and their mobility status. Workers with permanent contracts benefit less from wage increases than temporary workers. According to our previous analysis, these workers are more protected by the JRS than temporary workers in terms of the likelihood of being employed in the model where the alternative

to the JRS is unemployment. Regarding wage increases associated with job-to-job movements, our results suggest a positive effect of job reallocation on wages. However, it's important to note that most JRS participants employed in December 2021 remained with the same firm, especially permanent workers (82.6 %). This suggests a potential trade-off between the job security provided by JRS participation and the rate of wage growth for permanent workers.

We calculated previous marginal effects on wage changes by restricting our sample to workers with short tenure (less than 3 years). The results, presented in Appendix Table A2a, are similar.

Conclusions

The extension of JRS coverage to temporary workers during the COVID-19 crisis in Spain was a novelty aimed at providing broader protection. Using detailed administrative data, we analyse how JRS participation affects employment status and wages, focusing on differences by contract type.

Our findings support the effectiveness of JRS in preserving employment during crises, consistent with previous research (e.g., Boeri and Cahuc, 2023). Specifically, by December 2021 and after correcting for endogeneity, we found that permanent employees who participated in JRS had a 23.5 percentage point higher probability of remaining employed than those who became unemployed due to the COVID-19 shock. Interestingly, temporary workers also benefited. Compared to their unemployed counterparts, they were 13.1 percentage points more likely to remain in employment. This differential impact on permanent employees underscores the higher economic gains of protecting the most valuable employment relationships, particularly those involving significant specific human capital. This finding underlines the importance of considering the internal dynamics of firms and their relationships with employees when designing and implementing JRS schemes.

While JRS positively impacted employment status, particularly for permanent workers, our analysis reveals other differences across labor market segments. Temporary workers experienced shorter JRS participation durations (15% less than permanent workers), and the positive impact on post-pandemic employment probability was lower for them. This highlights the complex interplay between policy interventions, labor market dynamics, and the broader consequences for workers during crises.

Additionally, our analysis of wage dynamics provides further insights. Permanent workers who remained employed in April 2020 enjoyed the highest wages, followed by those in short-time work, and finally, those who transitioned to unemployment. Permanent jobs consistently commanded higher wages than temporary ones, with a wage gap of around $10,000 per year.

Temporary workers in a JRS program in April 2020 saw an 18.4% wage increase between February and December 2020, compared to a 3% increase for permanent workers. This effect was particularly stronger for workers moving between firms. By December 2021, JRS participation positively impacts the wages of temporary workers, particularly

movers, with wages increasing by around 5% for non-movers and 10% for movers. For permanent workers, positive wage effects were only observed for those who changed firms, with no significant impact for those remaining with the same employer.

These results suggest a differential impact of JRS on wages, with permanent contract holders benefiting less. Changing jobs seems to contribute to wage growth, although most JRS participants remained with the same employer, especially among those employed permanently (82.6%). This indicates a potential trade-off between job security and wage growth for those with permanent contracts.

The modest wage growth observed for permanent workers suggests that JRS may reduce employers' pressure to increase wages by guaranteeing job security. However, this job security could weaken workers' bargaining power if they perceive it as contingent upon accepting lower wages. Our analysis highlights the distinct impacts on the wages of temporary and permanent workers, particularly in segmented labor markets like Spain. While JRS may lead to more favorable wage adjustments for temporary workers in unstable contexts, permanent workers may experience lower wage increases. This trade-off between job security and wage growth is crucial when designing and implementing JRS.

Table A1a: Average Predicted Probabilities and AME of JRS Participation on Employment Probability in December 2020 if tenure<3 years

	Without JRS Endogeneity Correction		With JRS Endogeneity Correction	
	From Permanent Empl.	From Temporary Empl.	From Permanent Empl.	From Temporary Empl.
$\Pr(E_{Dec20}=1\|JRS\_All=1)$	0.886	0.903	0.863	0.868
	(0.0007)	(0.0009)	(0.002)	(0.003)
$\Pr(E_{Dec20}=1\|JRS\_All=0)$	0.785	0.719	0.806	0.741
	(0.001)	(0.001)	(0.002)	(0.002)
AME of JRS_All	0.101	0.184	0.057	0.127
	(0.001)	(0.002)	(0.003)	(0.004)
$\Pr(E_{Dec20}=1\|JRS\_U=1)$	0.706	0.781	0.704	0.775
	(0.001)	(0.001)	(0.002)	(0.002)
$\Pr(E_{Dec20}=1\|JRS\_U=0)$	0.211	0.398	0.235	0.415
	(0.004)	(0.003)	(0.010)	(0.007)
AME of JRS_U	0.496	0.382	0.469	0.359
	(0.004)	(0.003)	(0.011)	(0.009)

Note: Standard errors between brackets.

Table A1b: Average Predicted Probabilities and AME of JRS Participation on Employment Probability in December 2021 if tenure<3 years

	Without JRS Endogeneity Correction	With JRS Endogeneity Correction

	From Permanent Empl.	From Temporary Empl.	From Permanent Empl.	From Temporary Empl.
$\Pr(E_{Dec20} = 1 \mid JRS\_All = 1)$	0.927	0.903	0.911	0.873
	(0.001)	(0.002)	(0.003)	(0.005)
$\Pr(E_{Dec20} = 1 \mid JRS\_All = 0)$	0.905	0.833	0.914	0.843
	(0.001)	(0.001)	(0.001)	(0.002)
AME of JRS_All	0.022	0.071	-0.003	0.030
	(0.002)	(0.002)	(0.004)	(0.006)
$\Pr(E_{Dec20} = 1 \mid JRS\_U = 1)$	0.856	0.847	0.855	0.842
$\Pr(E_{Dec20} = 1 \mid JRS\_U = 0)$	0.624	0.675	0.650	0.689
AME of JRS_U	0.233	0.172	0.205	0.152
	(0.009)	(0.006)	(0.020)	(0.014)

Note: Standard errors between brackets.

Table A2a. Table 5. Marginal Effect of JRS Participation on Wage Growth for Tenure <3 years.

	OLS				**IV**			
	From Permanent Empl.		From Temporary Empl.		From Permanent Empl.		From Temporary Empl.	
	$\log(\frac{wage_{Dec20}}{wage_{Feb20}})$							
	Same firm	**Different firm**	**Same firm**	**Different firm**	**Same firm**	**Different firm**	**Same firm**	**Different firm**
JRS_All	0.013	-0.033	-0.026	-0.071	-0.032	0.290	0.007	0.330
	(0.004)	(0.012)	(0.006)	(0.012)	(0.026)	(0.054)	(0.033)	(0.059)
JRS_E	0.011	-0.069	-0.035	-0.115	0.051	0.416	0.106	0.471
	(0.004)	(0.012)	(0.006)	(0.013)	(0.023)	(0.047)	(0.029)	(0.051)
	$\log(\frac{wage_{Dec21}}{wage_{Feb20}})$							
	Same firm	**Different firm**	**Same firm**	**Different firm**	**Same firm**	**Different firm**	**Same firm**	**Different firm**
JRS_All	-0.004	-0.029	-0.001	-0.025	-0.019	0.065	0.017	0.101
	(0.003)	(0.007)	(0.005)	(0.008)	(0.011)	(0.020)	(0.016)	(0.023)
JRS_E	-0.005	-0.018	0.003	-0.010	-0.006	0.066	0.026	0.098
	(0.003)	(0.007)	(0.005)	(0.008)	(0.011)	(0.018)	(0.014)	(0.020)

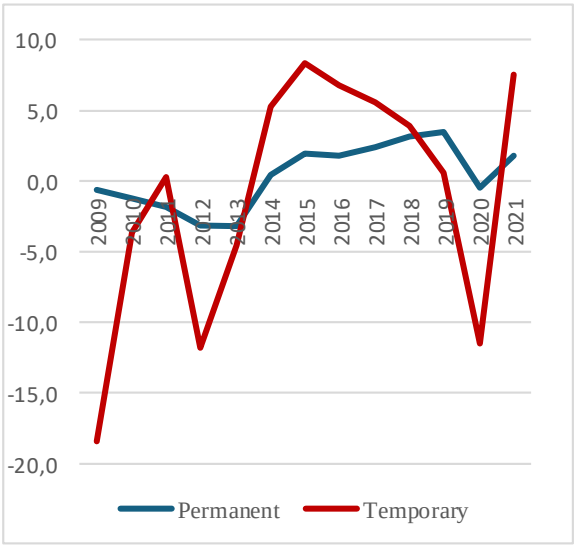
Note: Standard errors (robust) between brackets

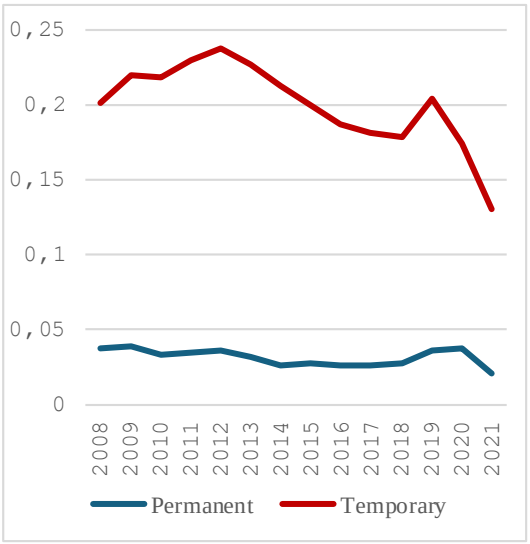
Table A2b. Table 5. Marginal Effect of JRS Participation on Wage Growth with wage/day.

	OLS	**IV**

	From Permanent Empl.		From Temporary Empl.		From Permanent Empl.		From Temporary Empl.	
	$\log(\frac{wage_{Dec20}}{wage_{Feb20}})$							
	Same firm	**Different firm**	**Same firm**	**Different firm**	**Same firm**	**Different firm**	**Same firm**	**Different firm**
JRS_All	-0.004	0.127	0.021	0.152	0.006	0.399	0.018	0.411
	(0.002)	(0.009)	(0.004)	(0.009)	(0.011)	(0.033)	(0.019)	(0.037)
JRS_E	-0.003	0.103	0.015	0.120	0.014	0.392	0.031	0.410
	(0.002)	(0.009)	(0.005)	(0.010)	(0.010)	(0.029)	(0.017)	(0.032)
	$\log(\frac{wage_{Dec21}}{wage_{Feb20}})$							
	Same firm	**Different firm**	**Same firm**	**Different firm**	**Same firm**	**Different firm**	**Same firm**	**Different firm**
JRS_All	-0.003	0.040	0.025	0.068	-0.004	0.137	0.058	0.199
	(0.001)	(0.005)	(0.004)	(0.006)	(0.005)	(0.013)	(0.012)	(0.017)
JRS_E	-0.003	0.029	0.017	0.049	-0.001	0.132	0.061	0.195
	(0.001)	(0.005)	(0.004)	(0.006)	(0.005)	(0.012)	(0.010)	(0.015)

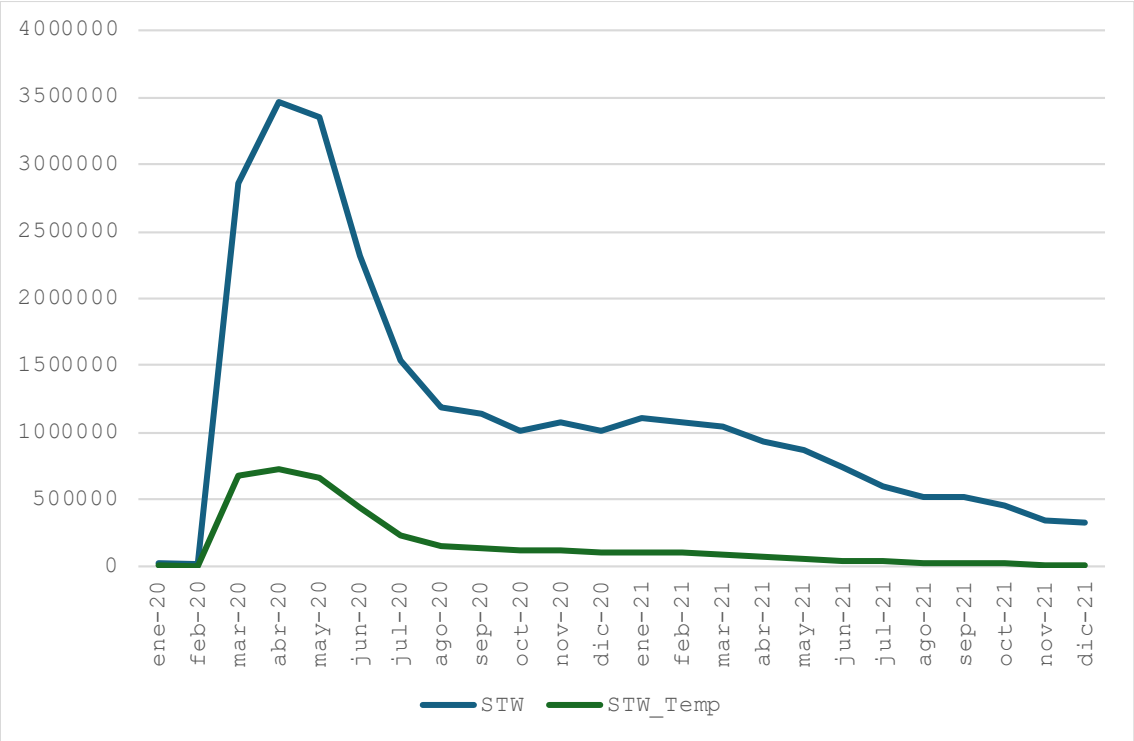
Figure A1a Annual Employment Growth Rates **A1b Employment exits to Unemployment**





Source: LFS

Figure A2 JRS participants' evolution



Source: MCVL

References

Amuedo-Dorantes, C. (2000). Work transitions into and out of involuntary temporary employment in a segmented market: evidence from Spain. ILR Review, 53(2), 309-325.

Arranz, J. M., García-Serrano, C., & Hernanz, V. (2018). Short-Time Work and Employment Stability: Evidence from a Policy Change. British Journal of Industrial Relations, 56(1), 189-222.

Autor, D., Cho, D., Crane, L. D., Goldar, M., Lutz, B., Montes, J., & Yildirmaz, A. (2022). An evaluation of the paycheck protection program using administrative payroll microdata. Journal of Public Economics, 211, 104664.

Basso, G., Depalo, D., & Lattanzio, S. (2023). Worker flows and reallocation during the recovery. Labour Economics, 102399.

Bartik, A. W., Bertrand, M., Lin, F., Rothstein, J., & Unrath, M. (2020). Measuring the labour market at the onset of the COVID-19 crisis (No. w27613). National Bureau of Economic Research.

Bentolila, S., & Dolado, J. J. (1994). Labour flexibility and wages: lessons from Spain. Economic policy, 9(18), 53-99.

Bentolila, S., J.J. Dolado, and J.F. Jimeno (2020): "Dual Labour Markets Revisited", Oxford Research Encyclopedia of Economics and Finance.

Boeri, Tito, and Herbert Bruecker. "Short-time work benefits revisited: some lessons from the Great Recession." Economic Policy 26.68 (2011): 697-765.

Boeri, T., & Cahuc, P. (2023). Labour Market Insurance Policies in the Twenty-First Century. Annual Review of Economics, 15.

Bellmann, L., & Hübler, O. (2023). Labour Mobility in German Establishments during the COVID-19 Crisis: Panel Data Analyses with Special Reference to Short-Time Work and Working from Home.

Bishop, J., & Day, I. (2020). How many jobs did JobKeeper keep?.

Carrillo-Tudela, C., Clymo, A., Comunello, C., Jäckle, A., Visschers, L., & Zentler-Munro, D. (2023). Search and Reallocation in the COVID-19 Pandemic: Evidence from the UK. Labour Economics, 102328.

CORTES, Guido Matias; FORSYTHE, Eliza. Heterogeneous labor market impacts of the COVID-19 pandemic. *ILR Review*, 2023, vol. 76, no 1, p. 30-55.

Chetty, R., Friedman, J. N., Hendren, N., Stepner, M., & The Opportunity Insights Team. (2020). How did COVID-19 and stabilization policies affect spending and employment? A new real-time economic tracker based on private sector data, 91, 1689-1699. Cambridge, MA: National Bureau of Economic Research.

Cortes, G. M., & Forsythe, E. (2023). Heterogeneous labor market impacts of the COVID-19 pandemic. ILR Review, 76(1), 30-55.

Davia, M., & Hernanz, V. (2004). Temporary employment and segmentation in the Spanish labour market: An empirical analysis through the study of wage differentials. Spanish Economic Review, 6, 291-318.

De la Rica Goiricelaya, Sara, 2003. "Wage differentials between permanent and temporary workers: Firm and occupational segregation," DFAEII Working Papers 1988-088X, University of the Basque Country - Department of Foundations of Economic Analysis II

Diaz, A., Dolado, J. J., Jáñez, Á., & Wellschmied, F. (2023). Labour Market Reallocation Effects of COVID-19 Policies in Spain: A Tale of Two Recessions.

Forsythe, E., Kahn, L. B., Lange, F., & Wiczer, D. (2022). Where have all the workers gone? Recalls, retirements, and reallocation in the COVID recovery. Labour Economics, 78, 102251.

Giupponi, G., Landais, C., & Lapeyre, A. (2022). Should we insure workers or jobs during recessions?. Journal of Economic Perspectives, 36(2), 29-54.

Güell, M., & Petrongolo, B. (2007). How binding are legal limits? Transitions from temporary to permanent work in Spain. Labour economics, 14(2), 153-183.

Hernanz, V., & Jimeno, J. F. (2013). Segmentación laboral y contratación dual: conversaciones póstumas con Luis Toharia. Revista de Economía Laboral,10(1), 135-149.

Jimeno, J.F. (2021): "Labor Hoarding and Employment Protection During the COVID-19 Crisis in a Dual Labor Market: Spain" in Michael R. Strain | Stan Veuger, eds., *Preserving Links in the Pandemic Policies to Maintain Worker-Firm Attachment in the OECD*, American Enterprise Institute.Kozeniauskas, N., Moreira, P., & Santos, C. (2022). On the cleansing effect of recessions and government policy: Evidence from Covid-19. European Economic Review, 144, 104097.

Kato, T., & Kodama, N. (2019). The Consequences of Short-Time Compensation: Evidence from Japan. IZA Discussion Papers 12596.

OECD (2020), *Job retention schemes during the COVID-19 lockdown and beyond,* https://www.oecd.org/coronavirus/policy-responses/job-retention-schemes-during-the-covid-19-lockdown-and-beyond-0853ba1d?fbclid=IwAR2M06GOvS6_2fYdtzdxg7Wh1ZZS-Oya69qSZwFWHB0vIBvSYFHft4YkzdY

Osuna, V., & García Pérez, J. I. (2022). Temporary layoffs, short-time work and COVID-19: The case of a dual labour market. Applied Economic Analysis, 30(90), 248-262.

Piore, Michael J. (1983). Labor market segmentation: to what paradigm does it belong?. The American Economic Review 73(2), 249-253.

Polavieja, J. G. (2003). Temporary contracts and labour market segmentation in Spain: an employment-rent approach. European Sociological Review, 19 (5), 501-17.