The changing use of short-time work schemes: Evidence from two recessions

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Abstract

We explore differences in resort to short-time work schemes between the recessions in the early 1990s and the late 2000s in Spain and Italy and explore how far these are associated with differences in employees' personal and job-related characteristics. We use individual data from national Labour Force Surveys and perform a multivariate detailed decomposition. We find that participation in these schemes in the second recession would have been even greater without the changes in skills and production structures in both countries.

Introduction

Short-time work (STW) schemes are intended to preserve jobs by encouraging work-sharing at firms experiencing temporarily low demand and providing income support to workers affected. A crucial aspect is that the contract of an employee with the firm is

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maintained during the period of reduced hours or temporary lay-off. This facilitates both flexibility and security (Eurofound, 2010).

Work-sharing exhibits a clear cyclical pattern, with substantially higher STW utilization during economic downturns. However, there is little literature on the extent to which their utilization varies with differing personal, job and employer-related attributes, especially when comparison is made across periods with similar economic conditions. Yet, changes in the composition of employment might explain some of the alteration observed in the use of STW schemes.

In this regard, the economies (and labour markets) of Western countries have undergone major changes in the last four decades, with significant impact on the composition of employment. We may highlight changes in technology (causing a shift in labour demand favouring high-skilled labour), increased foreign competition and the rising share of the services sector (Autor et al., 2003; Blinder, 2009; Goos et al., 2014). These have been coupled with alterations in labour supply, such as the increased numbers of university graduates, the secular rise in the labour market participation of women and the increased migration flows. Furthermore, labour market institutions have also undergone transformations through regulatory changes in the labour market and social protection in many European countries since the 1980s, in particular facilitating growing levels of temporary employment and other forms of non-standard employment (Boeri, 2011). Industrial relations institutions have also seen significant change: there has been a continuous decrease in unionization in Western economies since the early 1980s, and in bargaining coverage since the early 1990s. This trend was intensified during the 'Great Recession' (Visser, 2016), particularly since governments depending on external 'bail-outs' have been obliged to reduce the scope of collective bargaining and provoke disorganized decentralization (Marginson and Welz, 2014).

As we explain in more detail below, we may expect these changes to influence not only the composition of STW participants but also the take-up rate. One might predict that a higher share of highly educated and short-tenured workers and white-collar jobs would be involved in STW arrangements, while the incidence might also decline because of the lower share of jobs in the manufacturing sector in the economy.

The contribution of this article is twofold. First, we adopt an applied labour economics perspective to disentangle whether differences in the incidence of STW schemes between the recessions of the early 1990s and the late 2000s are associated with differences in personal and job-related characteristics. This allows us to shed some light on whether firms chose the same types of workers and jobs to participate in STW measures, whether they responded equally to similar changes in economic activity in both periods and the role of changes in jobs and workforce composition. In this vein, we test empirically the above predictions on the impact of the changes of employment composition on STW usage across economic downturns. Second, we provide a detailed picture of the attributes of employers and workers involved in STW schemes in both recessions in Italy and Spain, two countries where there are few previous studies on these issues.

As far as we know, this is the first study to carry out such a comparison of the functioning of STW schemes between two periods of recession and thereby to determine the relative influence of compositional changes. We use individual data from the Labour Force Survey (LFS) and rely on summary statistics to document compositional changes, probit

models to gauge changes in the returns of attributes and a multivariate detailed decomposition procedure, based on a non-linear response model, which enables us to determine how much of the change in the take-up rate between the two recessions is attributable to differences in either characteristics or returns. The findings indicate that the positive gap in involvement in an STW scheme between the two recessions would have been even greater without the changes in the skills and production structure that had taken place.

Our next section briefly reviews the economic literature on STW schemes and puts forward the hypotheses to be tested later. We then present a description of the regulations on STW in Italy and Spain. Next, we describe the data, then provide the empirical results of the decomposition of the difference in the STW take-up rates between the two recessions into the components of the changing characteristics of workers and firms and the changing impact of each attribute. The final section concludes. We do not include the Technical Annex (Supplementary Material) which presents the econometric approach and the more detailed estimate results that are discussed in the empirical section; both can be found on our web site at https://portal.uah.es/portal/page/portal/epd2_profesores/prof121191/publicaciones

Previous literature and hypotheses

Review of the literature

In response to the crisis between 2008 and 2009, most governments in OECD countries took specific measures to promote the use of STW schemes by weakening eligibility and conditionality requirements and increasing generosity, while others established new programmes (Eurofound, 2010; Sacchi et al., 2011; Walz et al., 2012). Although they had rarely been investigated before, there was an upsurge of interest in STW schemes during the Great Recession. Studies assessed the short-run efficiency of the policy at either the macroeconomic level (Arpaia et al., 2010; Balleer et al., 2014; Boeri and Bruecker, 2011; Cahuc and Carcillo, 2011; Hijzen and Martin, 2013; Hijzen and Venn, 2011) or the microeconomic level (Bellman et al., 2012; Boeri and Bruecker, 2011). The main conclusion of this strand of literature is that STW schemes have little or no effect in saving jobs in the short run, showing significant deadweight and displacement effects.

The incidence of STW schemes was low before the onset of the crisis, but their use increased dramatically at the end of 2008 and during 2009. Across the 25 OECD countries that operated such programmes, take-up rates increased from near zero before the crisis to over 1 percent of dependent employment (more than 4.5 million workers) in 2009. Differences across countries were substantial: take-up of 7 percent in Belgium; 4–5 percent in Germany and Japan; 1–2 percent in Austria, France, Italy, the Czech Republic, the Netherlands and Slovakia; and less than 1 percent in other countries including Spain (Hijzen and Martin, 2013).[1]

What sort of employers, jobs and employees participate in work-sharing arrangements? Eurofound (2010), using LFS data for the EU27, compared their characteristics with those of non-participants, showing that workers in manufacturing, with low levels of education and in blue-collar occupations were more likely to participate, with some cross-national variation. This overall picture is influenced by the importance of Germany,

Italy and France, as almost two out of three STW workers are located on these three countries. Some studies of the German and French cases confirm that STW employment tends to be concentrated among blue-collar jobs in relatively large manufacturing companies and relatively senior workers. Boeri and Bruecker (2011), with German data for 2009, showed that firms which took up STW had substantially more employees, a higher export share and a higher level of R&D activity than the average. The share of part-time workers and female workers in firms which utilized STW was substantially below the average. This corresponds to the standard pattern in German manufacturing, which participated disproportionally in STW schemes.

Calavrezo and Lodin (2012) used French administrative and survey data for the period 2007–2010 and found that manufacturing companies recorded the greatest number of hours (especially in sectors with a tradition of STW, such as automotive, metalworking and textiles, clothing and leather). Large firms with at least 500 employees accounted for more than one-third of STW-compensated hours. As for workers' characteristics, they found that men, less-educated individuals, workers with longer seniority (at least 10 years), working in blue-collar jobs and having atypical working hours (such as evening and night work and compressed work schedules) are over-represented.

Other empirical work has focused on the influence of the human capital of employees or the skill content of jobs. The findings are not clear-cut, though. Several studies from the early and mid-1990s found that skilled and craft workers and supervisors were more likely to be placed in STW schemes in Germany (Büchel and Pannenberg, 1992), while workers in low-wage, unskilled jobs were found more likely to participate in STW in the United States (Fuchs and Jacobsen, 1991) and Russia (Koumakhov and Najman, 2001).

Scholz (2012), using individual-level data for the district of Nuremberg, found that employers did not select STW workers according to their level of human capital or the costs of hiring and firing as measured by three different variables (seniority, educational attainment and skill level), at least during the period of expansion of STW (June 2008– March 2009), although it is not so clear afterwards. She therefore concludes that STW programmes were used initially as a work-sharing scheme, with a broad range of workers with differing attributes being selected. Niedermayer and Tilly (2016), using the same dataset, showed that differences between short-time and full-time workers in terms of tenure, experience and age are due to the fact that firms self-selecting into STW differ in their workforce from employers that do not, but selection within the firm is mostly a function of wage. At the firm level, however, Crimmann and Wiesner (2009) found that the higher the skill level of the workforce, the higher the likelihood that a firm uses STW schemes.[2]

To sum up, STW usage seems to be concentrated on jobs and workers with given characteristics: older, long-tenured, relatively low-educated workers in manual jobs in metal and manufacturing. However, the impact of some attributes (such as educational attainment and/or the skill content of jobs) either has changed across time or depends on specific features (structure of production, trade orientation) of the national economy.

Hypotheses

We put forward three hypotheses regarding the impact of changes in the structure of production and employment on the composition of STW participants and the level of

take-up, comparing two recessionary periods. In the empirical section of the article, we test these predictions using Spanish and Italian data coming from the LFS:

H1. Given the increase in numbers of university graduates and the shift in demand favouring high-skilled labour, more high-educated workers and white-collar jobs are involved in STW arrangements. Since firms in a knowledge-based economy would try to avoid a loss of human capital or shortage of skilled workers, one would expect to find a higher share of such workers and jobs in STW and an increased impact of education and skill on the likelihood of participating.

H2. STW schemes are used especially by firms with senior employees to reduce labour costs. However, the increased volatility of product markets and flexibility of labour markets and the reduced power of employee representatives as a consequence of changes in the industrial relations system may make it more feasible for employers to impose internal flexibility measures and to extend STW schemes to a broader range of workers regardless of their job tenure. Thus, we expect that the impact of length of service would have diminished when comparing the downturn of the early 1990s to the one of the late 2000s.

H3. The relationship among labour, capital and technology; the importance of firm- and sector-specific skills; and the organization of production and work can make it easier to implement work-sharing arrangements in manufacturing. However, the weight of this sector in the overall economy has diminished. Thus, one would expect to find not only a lower share of manufacturing jobs in STW schemes but also a reduced impact of working in those jobs on the probability of participation. These changes might have resulted in a lower STW take-up rate in the recessionary period of 2008–2012.

Regulation of STW

Spain

According to the 1980 *Estatuto de los Trabajadores*, the Spanish STW scheme was the legal instrument for protecting employment in exceptional circumstances, allowing firms temporarily to reduce employees' working time or suspend business activities. Any action concerning collective workforce adjustment should be preceded by an 'employment regulation process' (*expediente de regulación de empleo*, ERE). This included the temporary lay-off of workers and the temporary reduction of working time for some or all employees.

To initiate an ERE, the employer had to offer a minimum 30-day period of consultation and negotiation with the workers' representatives, and at the same time notify the labour authority, providing the necessary information to justify the measures proposed. The ERE required administrative authorization. If it was rejected, the firm was asked to reach an agreement with the workers. This procedure was common to all types of ERE (including those proposing the permanent dismissal of workers); the only difference was that in the case of STW, the time for a decision by the labour authorities was half of that

allowed in the case of permanent dismissals. This was also the case for firms with fewer than 50 employees and when the ERE involved less than 5 percent of the workforce of the establishment. The workers dismissed, temporarily laid-off or on STW were entitled to unemployment benefits (with a replacement rate of 80%), provided that they had contributed to the unemployment insurance system for long enough. In the case of STW, the benefit was proportional to the amount of working-time reduction. Employers had to continue paying social contributions for workers affected. In addition, the threshold for receipt of benefits was a reduction of one-third of normal hours.

The labour market reform of 1994 introduced several changes. In general, the aim was to simplify matters and reduce resolution times. It put a heavier burden on negotiation and tried to limit the role of the labour authority; in exchange, the employer was required to disclose information on its situation right at the beginning of the process, and firms with over 50 workers had to prepare a 'social plan'. Neither severance payments nor unemployment benefits were changed. In the case of STW, the documentation required was less burdensome to the firm.

The rules regulating STW arrangements remained unchanged until recently. The financial incentives to engage in and use STW increased somewhat in 2009, without a distinction by firm size, industry affiliation or other employer attributes. Some additional modifications affecting the procedure were adopted unilaterally by the governments in office in 2010 and, above all, 2012. The labour market reform of 2010 modified specific aspects with the objective of making the use of STW schemes more attractive. In addition, the labour market reform of 2012 eliminated administrative authorization and altered the consultation procedure, providing substantially more power to the employer, with the objective of encouraging bargaining between the firm and the legal representative of workers in the mandatory consultation period, and reducing the role of the labour authority. All these modifications may have eased and favoured further the implementation of STW arrangements by firms during the downturn that started in 2008.

Italy

The Italian STW scheme involves two programmes: the *Cassa integrazione guadagni ordinaria* (CIGO), created in 1947, and the *Cassa integrazione guadagni straordinaria* (CIGS), introduced in 1968. Both are financed by contributions paid by employers.

CIGO applies when companies suffer a temporary reduction of activities, and covers workers in construction and manufacturing in firms with more than 15 employees and workers in the service sector in firms with more than 50. CIGS covers a smaller range of sectors and deals with plant restructuring, production reorganization, prolonged crisis or bankruptcy. The maximum duration of CIGO is 12 months, while CIGS may extend to 24. Companies cannot participate in both programmes together for more than 36 months over 5 years.

In order to benefit from STW schemes, prior consultation with trade unions is required. The company must inform workers' representatives of the reasons for the measures, their extent and expected duration, and the number of workers involved. Thus, unions can influence decisions on the number and the characteristics of workers to be put in STW and the extent of hours reductions as well. CIGO and CIGS may replace up to 80 percent of previous earnings, but there is a low monthly ceiling. Furthermore, workers and

companies continue paying social security contributions while employees remain in STW, but they are paid only for actual hours worked. Contributions paid by employers increase with firm size. Employers using CIGO have to pay an additional contribution of 8 percent of the wage supplement if they employ more than 50 workers, 4 percent if less. However, if the firm can prove that the reduction of working hours was due to exogenous reasons, this component is not applied. CIGS also involves some experience-rating.

In 2009, the government created a new programme, *Cassa integrazione guadagni in deroga* (CIGD), aimed at extending the duration of CIG or helping companies and workers that are not covered. All workers employed for at least 90 days in firms operating in sectors or areas specified in ad hoc government agreements can benefit. CIGD pays a wage supplement (with a ceiling) for hours not worked equal to 80 percent of the full-time salary. Working time may be reduced by a maximum of 40 hours per week. CIGD was temporarily extended to small and medium-sized firms in the services sector without requiring that employers and employees had previously contributed to these schemes. Since CIGD is totally funded by public money, there is no cost for the employer for the hours of STW, so there is a strong incentive for firms to bring hours of work down to zero. During the Great Recession, the bulk of hours reductions in STW schemes occurred in CIGD.

Finally, in 2015, the 'Jobs Act' reformed the whole set of rules concerning income support measures for employees, abolishing all previous norms and setting up a consolidated new text that regulates all unemployment benefits schemes in the form of short-time allowances (CIGO and CIGS). It also abolished CIGD.

Data

We use LFS microdata to study the characteristics of participants in STW schemes and compare them between two different recessionary periods (early 1990s and late 2000s). The LFS is a nationally representative survey carried out quarterly by National Statistical Offices. This dataset includes detailed information about household structure and socio-demographic and labour market characteristics of all household members. For each person, an indicator of economic activity during the reference week establishes whether the person is employed, unemployed or out of the labour force. For those in employment, the information includes not only personal characteristics (such as gender, age, citizenship and educational attainment) but also job and workplace attributes (such as tenure, occupational category, institutional sector and industry affiliation).

The LFS allows the identification of workers who self-report that they are involved in an STW scheme. Two variables provide information on partial reductions of the normal working week for a limited period and temporary lay-offs (working week of zero hours). In the first case (STW with reduction of hours), individuals are asked about their reasons for working less than the standard working week, one such reason being that one is under an STW scheme. In the second case (STW with temporary lay-offs), information about the reasons for not having worked in the previous week is requested, one of the reasons being an STW scheme. In both cases, the contractual relationship with the firm remains and, in principle, it is expected that the individual will return to work with the same company under the previous working-time arrangement. On the basis of this information, we construct our variable of interest (STW) as a dummy variable that is equal to 1 if an

employee reports either a non-zero number of hours worked during the reference week because of STW or being absent from work during the reference week because of STW, and 0 otherwise.

Figure 1 in the Supplementary Appendix plots trends in the stock of participants in STW schemes in 1991–1995 and 2008–2012 in Spain and Italy as a proportion of total private sector employees. This information confirms that STW schemes are mainly used in a countercyclical manner. There was a significant increase in the take-up rate between 1991 and 1993 for both countries, coinciding with the economic crisis (with some delay in Spain because of increased public spending in large infrastructure projects – Barcelona Olympics and Expo '92 in Seville); the levels subsided by 1995, when the economies were starting a hesitant recovery. In the late 2000s, with the most recent financial and economic crisis, participation in STW increased substantially, not only in the first stage of the downturn (at the end of 2008 and during 2009) but also in the second phase (2012–2013), after a decrease during the mild economic recovery of 2010–2011.

The data also reveal a significant difference in the utilization of STW schemes between the two periods, with greater participation in work-sharing in the second period. This is clearer in Spain but also apparent in Italy, especially at the beginning of the last recession and in its second stage. As noted above, this might result from alterations in the structure of production and in the share of jobs across industries and occupational groups. Below, we test empirically in what direction (if any) the changes of employment composition have affected STW usage across both economic downturns.

Method and empirical results

We follow three steps. First, we examine summary statistics to document compositional changes. Second, we estimate models to gauge changes in the impact of personal and job characteristics. And third, we decompose the differential STW take-up rates of the 1991–1995 and the 2008–2012 periods after creating probit models with Spanish and Italian data on STW participants and non-participants. The econometric technique is a multivariate decomposition of a non-linear response model, the details of which are provided in the Technical Annex (Supplementary Material).

As a first step, Table 1 provides the characteristics of jobs and workers who participated in STW schemes in the two economic recessions. This information refers to the full

Table 1. Characteristics of workers in STW schemes (full sample) and total wage and salary workers (1991–1995 and 2008–2012).

	Spain				Italy			
	1991–1995		2008–2012		1991–1995		2008–2012	
	STW	All	STW	All	STW	All	STW	All
Gender (men)	0.808	0.662	0.742	0.533	0.602	0.625	0.672	0.551
Age groups (years)								
16–29	0.097	0.318	0.120	0.198	0.206	0.279	0.096	0.163
30–39	0.207	0.281	0.277	0.322	0.250	0.296	0.287	0.293

Table 1. (Continued)

	Spain				Italy			
	1991–1995		2008–2012		1991–1995		2008–2012	
	STW	All	STW	All	STW	All	STW	All
40–49	0.306	0.220	0.281	0.266	0.328	0.261	0.354	0.310
50–64	0.390	0.180	0.322	0.210	0.216	0.165	0.263	0.233
Education								
Less than secondary	0.605	0.382	0.184	0.368	0.797	0.535	0.519	0.347
Secondary	0.353	0.460	0.576	0.242	0.189	0.371	0.415	0.481
Tertiary	0.043	0.158	0.241	0.390	0.014	0.094	0.066	0.172
Job category								
WCHS	0.069	0.183	0.215	0.312	0.073	0.270	0.179	0.328
WCLS	0.179	0.359	0.108	0.305	0.101	0.285	0.133	0.294
BCHS	0.632	0.331	0.550	0.227	0.660	0.327	0.590	0.258
BCLS	0.119	0.128	0.127	0.156	0.165	0.118	0.098	0.120
Industry								
Primary	0.013	0.045	0.079	0.026	0.097	0.040	0.008	0.023
Construction	0.061	0.097	0.234	0.082	0.093	0.075	0.078	0.070
Industry	0.774	0.336	0.294	0.158	0.684	0.307	0.650	0.242
Trade	0.096	0.144	0.146	0.210	0.041	0.116	0.085	0.168
Transport	0.026	0.093	0.091	0.048	0.025	0.065	0.036	0.054
Other services	0.031	0.284	0.156	0.476	0.059	0.398	0.142	0.444
Tenure								
1–11 months	0.063	0.293	0.108	0.107	0.032	0.059	0.020	0.063
1–3 years	0.064	0.127	0.118	0.209	0.123	0.152	0.086	0.164
3–7 years	0.100	0.155	0.199	0.234	0.202	0.228	0.195	0.215
7–10 years	0.047	0.065	0.107	0.103	0.093	0.100	0.137	0.115
>10 years	0.726	0.360	0.468	0.346	0.550	0.462	0.563	0.442
Region[a]								
1	0.178	0.232	0.197	0.251	0.308	0.308	0.340	0.303
2	0.096	0.116	0.135	0.111	0.185	0.207	0.144	0.153
3	0.069	0.053	0.079	0.052	0.184	0.221	0.075	0.133
4	0.152	0.098	0.096	0.090	0.236	0.176	0.334	0.283
5	0.036	0.103	0.178	0.104	0.088	0.089	0.107	0.128
6	0.096	0.154	0.098	0.165				
7	0.191	0.059	0.091	0.051				
8	0.181	0.185	0.127	0.176				

WCHS: white-collar high-skilled; WCLS: white-collar medium- and low-skilled; BCHS: blue-collar high- and medium-skilled; BCLS: blue-collar low-skilled occupations.

[a]Spain: 1 = Andalusia, Murcia, Balearic Islands and Canary Islands; 2 = Extremadura and Castile; 3 = Aragon, Rioja and Navarre; 4 = Galicia, Asturias and Cantabria; 5 = Valencia; 6 = Madrid; 7 = Basque Country; and 8 = Catalonia.

[a]Italy: 1 = Piemonte, Valle d'Aosta, Lombardia and Liguria; 2 = Trentino-Alto Adige, Friuli-Venezia Giulia, Veneto and Emilia-Romagna; 3 = Toscana, Umbria, Marche, Lazio and Abruzzo; 4 = Molise, Campania, Puglia, Basilicata and Calabria; and 5 = Sardegna and Sicilia.

sample of workers aged 16–64 without any further restriction. For the sake of comparison, Table 1 also shows the distribution of employment for all salaried workers. Supplementary Table A.1 gives the same information regarding participants in STW schemes for a selected sample that focuses on a sample of workers with seniority of 1 year or more in the private, non-agricultural sector. This restriction has been imposed for the sake of robustness in order to arrive at a more homogeneous sample of workers who are potentially eligible to participate in a programme, which excludes newly hired workers and also those working in the public sector.

The summary statistics presented in Table 1 indicate relatively large compositional differences concerning personal and job-related attributes of participants in STW schemes between both periods (results are qualitatively and quantitatively similar with the selected sample).

With respect to job-related attributes, there are important differences between the two periods. In Spain, the metal and manufacturing industry accounted for 77 percent of all STW participants during the first recession, but only 30 percent in the second. At the same time, some services sectors and, above all, construction increased their share, making the distribution across industries more homogeneous. In Italy, these changes were less marked, since the metal and manufacturing sectors maintained their prevalence in both recessions, accounting for about two-thirds of all participants; but services sectors clearly increased their share. These changes partially explain the larger share of some regions in the distribution of STWs. This is the case with the Basque Country and Catalonia in the first period and Valencia in the second in Spain; and Regions 1 and 4 in Italy. This partly reflects overall changes in the sectoral distribution of employment, with a significant decline of the share of manufacturing, from 34 to 16 percent in Spain and from 31 to 24 percent in Italy, respectively, and a corresponding rise of the services sectors. However, the substantial increase of STW workers in construction in Spain during 2008–2012 does not reflect the weight of this industry but the burst of the housing bubble.

Furthermore, long-tenured workers predominate. In Spain, nearly three-quarters of all workers on STW in the early 1990s had more than 10 years' service with the same employer; this group accounted for about 50 percent of the total during the late 2000s. In Italy, the distribution has remained more stable, with the share of that group remaining above 50 percent. Finally, the prevalence of blue-collar occupations observed in the first recession has remained in the most recent crisis, although the proportion working in manual jobs fell in both countries (7 percentage points in Spain and 14 in Italy). Conversely, the presence of high-skilled white-collar workers increased notably during the second crisis. Again, this partially reflects what happened with overall employment, with both countries exhibiting higher shares of more qualified, non-manual jobs in the second period.

In terms of personal characteristics, STW is more frequent among men, with a decline of about 7 percentage points between the early 1990s and the late 2000s for Spain and a similar increase for Italy. Prime age and older groups were over-represented during the early 1990s (also in the late 2000s). In particular, 70 percent of individuals in STW were older than 40 in Spain and 54 percent in Italy. Their share was almost 10 percentage points lower in the late 2000s in Spain but 8 percentage points higher in Italy. In both

countries, those in their 30s increased their presence in STW during the second crisis. Workers with lower skills (less than secondary level of education) were more likely to be involved during the early 1990s, whereas more educated workers substantially increased their presence in the late 2000s. This result partially reflects the increase of the average level of education of the working population.

Summing up, the bulk of STW employment tends to be concentrated among older, long-tenured, relatively low-educated workers in manual jobs in metal and manufacturing. However, compositional changes have been relatively large between the recessions of the early 1990s and the late 2000s. The broad picture of jobs and workers in STW matches that in other countries. Below we try to disentangle to what extent the alteration in jobs and workforce composition accounts for the change in the use of STW programmes.

As a second step, Table 2 provides the results of the estimates of a probit model on the probability of having been involved in an STW scheme in 1991–1995 and in 2008–2012. We report the marginal effect of each variable. In addition to the set of variables

Table 2. Estimate results of a probit model on the probability of STW participation.

	1991–1995			2008–2012		
	Coeff.	SE	Signif.	Coeff.	SE	Signif.
Full sample, Spain						
Gender (ref.: women)	−0.112	0.019	***	0.026	0.010	**
Age groups (ref.: 16–29 years)						
30–39	0.117	0.026	***	0.083	0.015	***
40–49	0.199	0.028	***	0.124	0.015	***
50–64	0.289	0.029	***	0.182	0.016	***
Education (ref.: less than secondary)						
Secondary	0.037	0.017	**	0.008	0.012	
Tertiary	−0.167	0.040	***	−0.081	0.015	***
Industry (ref.: construction)						
Agriculture	−0.678	0.052	***	−0.196	0.018	***
Industry	0.513	0.027	***	−0.214	0.017	***
Trade	−0.027	0.033		−0.371	0.015	***
Transport	−0.148	0.048	***	−0.205	0.017	***
Other services	−0.363	0.041	***	−0.561	0.015	***
Job category (ref.: WCHS)						
WCLS	−0.055	0.033	*	−0.183	0.015	***
BCHS	0.194	0.032	***	0.188	0.013	***
BCLS	0.165	0.037	***	0.069	0.016	***
Job tenure (ref.: 1–3 years)						
<1 year	−0.231	0.033	***	−0.049	0.018	***
3–7 years	0.016	0.031		0.070	0.016	***
7–10 years	−0.025	0.039		0.121	0.018	***
>10 years	0.217	0.028	***	0.120	0.015	***

(Continued)

Table 2. (Continued)

	1991–1995			2008–2012		
	Coeff.	SE	Signif.	Coeff.	SE	Signif.
Region (ref.: 1)[a]						
2	−0.161	0.024	***	0.009	0.013	
3	−0.026	0.026		0.172	0.015	***
4	0.075	0.023	***	0.044	0.014	***
5	−0.368	0.037	***	0.271	0.015	***
6	−0.142	0.038	***	−0.022	0.023	
7	0.265	0.023	***	0.292	0.017	***
8	−0.106	0.025	***	−0.030	0.016	*
GDP growth rate	−0.057	0.004	***	−0.057	0.002	***
Intercept	−3.082	0.053	***	−2.564	0.027	***
Pseudo R^2	0.145			0.080		
Full sample, Italy						
Gender (ref.: women)	−0.265	0.019	***	−0.097	0.017	***
Age groups (ref.: 16–29 years)						
30–39	0.138	0.026	***	0.095	0.029	***
40–49	0.268	0.027	***	0.159	0.029	***
50–64	0.291	0.030	***	0.217	0.030	***
Education (ref.: less than secondary)						
Secondary	−0.097	0.023	***	−0.039	0.017	**
Tertiary	−0.235	0.060	***	−0.100	0.032	***
Industry (ref.: construction)						
Agriculture	0.205	0.042	***	–	–	
Industry	0.301	0.030	***	−0.356	0.071	***
Trade	−0.266	0.044	***	0.447	0.028	***
Transport	−0.398	0.050	***	−0.117	0.036	***
Other services	−0.683	0.040	***	−0.166	0.043	***
Job category (ref.: WCHS)						
WCLS	−0.019	0.036		−0.071	0.026	***
BCHS	0.307	0.034	***	0.293	0.023	***
BCLS	0.353	0.039	***	0.202	0.031	***
Job tenure (ref.: 1–3 years)						
Less than 1 year	−0.074	0.050		−0.083	0.059	
3–7 years	−0.009	0.030		0.054	0.029	**
7–10 years	0.019	0.036		0.082	0.032	***
More than 10 years	0.047	0.029		0.106	0.027	***
Region (ref.: 1)[b]						
2	−0.028	0.024		0.060	0.022	***
3	0.038	0.025		−0.091	0.024	***
4	0.231	0.025	***	0.014	0.019	
5	0.259	0.034	***	0.035	0.028	
GDP growth rate	0.071	0.016	***	0.039	0.016	**

Table 2. (Continued)

	1991–1995			2008–2012		
	Coeff.	SE	Signif.	Coeff.	SE	Signif.
Intercept	−2.354	0.054	***	−2.326	0.049	***
Pseudo R^2	0.136			0.111		

SE: standard error; WCHS: white-collar high-skilled; WCLS: white-collar medium- and low-skilled; BCHS: blue-collar high- and medium-skilled; BCLS: blue-collar low-skilled occupations; GDP: gross domestic product.
[a]Spain: 1 = Andalusia, Murcia, Balearic Islands and Canary Islands; 2 = Extremadura and Castile; 3 = Aragon, Rioja and Navarre; 4 = Galicia, Asturias and Cantabria; 5 = Valencia; 6 = Madrid; 7 = Basque Country; and 8 = Catalonia.
[b]Italy: 1 = Piemonte, Valle d'Aosta, Lombardia and Liguria; 2 = Trentino-Alto Adige, Friuli-Venezia Giulia, Veneto and Emilia-Romagna; 3 = Toscana, Umbria, Marche, Lazio and Abruzzo; 4 = Molise, Campania, Puglia, Basilicata and Calabria; and 5 = Sardegna and Sicilia.
Significance levels: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

considered above, we have included the gross domestic product (GDP) growth rate to control for the variability of the business cycle. Furthermore, regressions have also been run for the more homogeneous sample of workers in the non-primary sector with tenure of at least 1 year in order to check the robustness of the estimations (see Supplementary Tables A.2 and A.3).

The estimate results confirm the previous descriptive analysis: STW is used more intensely when demand declines in manufacturing sectors, with a special focus on manual jobs and in relation to workers with higher employment protection (older and long-tenured employees).[3] This finding is interesting on its own right, but we are concerned whether a change also occurred in the returns of attributes. When the estimates of both periods are compared, we find that the impact of some regressors diminished. For instance, there are smaller effects of age, educational attainment, job category, tenure (in Spain) and industry (again only in Spain).

Therefore, although the overall picture of the use of STW schemes seems to be similar across periods, the varying effects of several personal and job-related attributes point to a reduced specialization in terms of jobs and workers. This finding resembles the conclusions obtained by Scholz (2012) for Germany in the period of increased utilization of STW programmes during the last recession, in the sense that employers selected a broad range of workers, irrespective of their level of human capital or skill. Walz et al. (2012) arrive at the same results when analysing microdata from Germany, France and Austria.

After examining compositional changes and evaluating changes in the impact of characteristics, our third step provides the decomposition of the difference in the probability of participating in an STW scheme between the two economic downturns. Table 3 gives the aggregate results (see equation (1) of the Technical Annex, Supplementary Material), whereas SupplementaryTable A.4 reports the detailed results showing the contribution of each factor towards explaining the difference (see equation (2) of the Technical Annex, Supplementary Material). In these tables, estimates are provided for the sample of all

Table 3. Aggregate decomposition results: full sample.

	Spain			Italy		
	Coeff.	Sig.	%	Coeff.	Sig.	%
Change due to difference in characteristics (E)	−0.13	***	−30.33	−0.20	***	−37.29
Change due to difference in coefficients (C)	0.54	***	130.33	0.74	***	137.29
Overall change $(\bar{Y}_A - \bar{Y}_B)$	0.41	***	100.00	0.55	***	100.00

Significance levels: ***$p < 0.01$.

workers. Estimate results for the subsample of workers in the non-primary, private econ-
omy with seniority longer than 1 year are shown in Supplementary Tables A.5 and A.6.

The decomposition at an aggregate level shows that differences in effects explain the
entire observed differential in the incidence of STW, with differences in intercepts (base-
line probabilities) accounting for most of this. The higher incidence of STW in the 2008–
2012 crisis compared to 1991–1995 is not particularly related to the impact of changes in
the distribution of workers and job characteristics (E), that is, the explained component.
Indeed, this component would have led to a decrease in the use of STW schemes in the
recent period. However, this effect arising from changes in the characteristics was more
than compensated by a positive impact of the difference in coefficients (C), that is, the
unexplained component that accounts for about 130–140 percent of the observed differ-
ential in the probability of involvement in STW in both countries. Results arising from
the subsample are qualitatively the same, although the percentages corresponding to
each component are higher in absolute value.

It should be noted that the constant term, that could be interpreted as a residual factor
after changes in characteristics and coefficients are discounted, has a positive sign and is
large (see the last row of Supplementary Tables A.4 and A.6), indicating an independent,
significant higher incidence of STW in the second recession as compared with the first
one. It could be associated with some changes approved to foster these mechanisms in
the aftermath of the recession of 2008, which would have led employers and workers to
agree on the more intensive use of STW regardless of the type of worker, job or sector
and the composition of employment.

The second aspect worth mentioning relates to the 'explained' component. In this
case, a negative E_k coefficient (see the Technical Annex, Supplementary Material) would
indicate the expected increase in take-up rates between the two recessions, if the 2008–
2012 crisis had been equal to 1991–1995 regarding the distribution of X_k. Looking at the
characteristics explaining this impact of the differences in the composition of employ-
ment between the two downturns, we find that changes in the skill mix (in terms of
educational attainment and occupational categories) and in the sectoral structure are the
main drivers. In this case, shifting the distribution of the late 2000s on skills, jobs and
industry to the level of the early 1990s would provide the largest increase in the differen-
tial. This is even clearer using the subsample of workers in the non-primary, private
economy. Therefore, we would have expected a larger take-up rate had the structure of
employment remained the same. This means that these changes lowered the incidence of
STW schemes in the 2008–2012 recession.

Finally, regarding the unobserved component (which refers to the change in the coefficients), a negative C_k coefficient indicates the expected increase in the gap between the first and the second recession, if the returns to characteristics in the late 2000s were the same as in the early 1990s. In this case, the results show that the different use of STW schemes in the second downturn can be mostly attributed to the different impact of variables such as occupation, industry, education (in Italy) and tenure (in Spain). In particular, short-tenured, high-skilled workers were more likely to participate in 2008–2012 in Spain. If long-tenured workers in less-skilled jobs and in metal and manufacturing had been exposed to STW in the late 2000s to the same degree as in the early 1990s, the differential take-up rate could have been expected to increase substantially. This result is less clear for Italy, where the role of education seems to be more important than that of tenure.

Summary and conclusion

Our main goal was to compare the utilization of STW arrangements in two economic recessions and to perform a decomposition of the STW differential take-up rates in two components – that of the changing characteristics of workers and firms and that of the changing impact of each attribute. Our analysis is particularly relevant because although STW played a relatively significant role during previous economic downturns in Spain and Italy, there is little evidence in the literature about the way in which firms used the measure, especially in the Spanish case. Moreover, our decomposition takes advantage of the comparison between two recessions in order to determine the relative influence of compositional changes. The rise of the STW take-up rate at the end of 2008 and during 2009, which peaked again in 2012, was larger than the one observed in the early 1990s in both countries.

Our results suggest that participation in STW schemes is more likely for workers with higher employment protection (older, long-tenured, less-educated workers), in manual jobs and in manufacturing industries. However, compositional changes were large when comparison is made between recessions, so the proportions of short-tenured, high-educated workers in non-manual jobs and in the services sectors increased. Furthermore, the comparison of the estimates of a probit model for both periods shows that the impact of some personal and job-related attributes diminished in the second period. These findings suggest that the recession of 2008–2012 displayed a lower specialization of STW arrangements on certain types of jobs and workers. This supports our prediction (H1) that overall changes in the economy influenced the composition of STW participants, increasing the participation of high-educated workers and white-collar jobs.

The decomposition of the differential probability of participating in an STW scheme between the two economic downturns shows that differences in effects explain mainly the observed differential. The changing composition of employment would have led to a decrease in the use of STW schemes in the recent period and we would have expected a larger take-up rate had the structure of employment remained the same. This finding lends support to our prediction (H3) that changes in employment composition, especially the lower share of jobs in manufacturing, should reduce the take-up rate. These results may be relevant for policy-makers because in future crisis situations, governments need

to be able to make more informed and better decisions on introducing or modifying STW schemes.

Differences in intercepts account for most of the gap in take-up rates. This result may be linked to the financial incentives and the changes in the procedure designed to foster STW mechanisms in the aftermath of the Great Recession (in Spain) and the creation of a new programme (in Italy). These differences can also reflect the increased volatility and instability of product markets and the reduction of the bargaining power of trade unions and employee representatives, features that may make it more feasible for employers to impose internal flexibility measures such as STW schemes and to implement these for all workers regardless of seniority (H2). The evidence confirms this in Spain but not in Italy. This calls for an analysis which provides further evidence at the microeconomic level on the efficiency of STW schemes and the resources devoted to them during the recessions and the impact of participation on the labour market trajectories of employees.

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Supplementary Material

Supplementary material is available for this article online.

Notes

1. When full-time equivalent take-up rates are computed, Belgium, Germany and Japan move down the ranking, while Finland, Norway and Spain move up (Hijzen and Venn, 2011). Cross-country comparison is difficult because of differences in programme coverage and in the way that take-up is measured. Therefore, it is not surprising that figures for the same countries differ across studies. According to administrative data, the Spanish take-up rate increased from 0.2 percent in 2007 and 0.6 percent in 2008 to 3.1 percent in 2009.
2. This result would be consistent with the view that employers tend voluntarily to hoard talented employees and save the costs of hiring highly qualified workers because of the firm-specific human capital (Crimmann et al., 2012).
3. The gross domestic product (GDP) change is wrongly signed in the case of Italy. However, this does not seem to be at odds with previous studies.

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