

# Temporary layoffs, short-time work and COVID-19: the case of a dual labour market

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## Abstract

**Purpose** – This paper aims to study the type of short-time work (STW) schemes implemented in Spain to preserve jobs and workers' incomes during the COVID-19 crisis and the corresponding labour market outcomes.

**Design/methodology/approach** – A dynamic macroeconomic model of job creation and destruction of the search and matching type in a dual labour market.

**Findings** – The model shows that the availability of STW schemes does not necessarily prevent a large increase in unemployment and job destruction. The quantitative effects depend on the degree of subsidization of payroll taxes and on the design of the policy. A scenario with a moderate degree of subsidization and where the subsidy is independent of the reduction in hours worked is the least harmful for both welfare and fiscal deficit. The cost of such a strategy is a higher unemployment rate. Concerning heterogeneous effects, the unemployed are the ones who experience the strongest distributional changes.

**Originality/value** – The effectiveness of STW schemes in dual labour markets using a search and matching model in the context of the COVID-19 crisis has not been analysed elsewhere. The literature has emphasized the importance of dynamics, labour market institutions and workers' heterogeneity to understand workforce adjustment decisions in the face of temporary shocks to demand especially when firms' human capital is relevant. These elements are present in the model. In addition, this paper computes welfare and distributional effects and the cost of these policies.

**Keywords** Welfare, Unemployment, Duality, Short-time work, Temporary layoffs

**Paper type** Research paper

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## 1. Introduction

The COVID-19 crisis has been an unprecedented shock to all economies around the world. The huge drop in the gross domestic product in most countries has triggered significant workforce adjustments. Most governments in the developed world have implemented policies to prevent massive layoffs and sharp declines in workers' incomes by facilitating and subsidizing short-time work (STW) schemes (OECD, 2020) [1]. The Spanish Government is not an exception. Contrary to what happened during the Great Recession, where the lack of internal flexibility together with the dual structure of the Spanish labour market led to the highest rates of unemployment and job destruction in the European Union (EU), the Spanish unemployment rate only increased by 2.5 percentage points during the first year of the pandemic. However, this picture might be misleading. It is true that the unemployment rate has only experienced a modest rise, but this is partly due to the changes in the regulation of STW introduced in the 2009, 2010 and 2012 labour market reforms, to the generosity of the subsidies provided by these schemes and to the fact that many workers have left the labour force due to difficulties in finding jobs [2].

This paper studies the type of STW schemes implemented in Spain during the COVID-19 crisis with the aim of preserving jobs and worker's incomes. Firstly, we compute the steady-state effects on labour market outcomes under different STW scenarios. Then, we perform a transition exercise to evaluate welfare losses, the costs of these policies and the distributional effects. For this purpose, we use a model of job creation and destruction of the search and matching type, similar to García-Pérez and Osuna (2015). The model captures the dual structure of the Spanish labour market and includes the features of the Spanish regulation concerning STW implemented during the COVID-19 crisis. In García-Pérez and Osuna (2015), STW schemes were modelled in the context of the Great Recession. In that paper, firms are heterogeneous with respect to the productivity of their matches and endogenously adjust the workforce upon the arrival of negative shocks. Firms have three options:

- (1) to continue producing with the current match, working at standard hours;
- (2) to continue producing with the current match at a reduced number of hours; or
- (3) to terminate the match and dismiss the worker.

This paper adds a fourth option: the possibility of using temporary layoffs (TL) as an alternative adjustment mechanism. As the formal description of the model is very similar to García-Pérez and Osuna (2015), except for the addition of TL, we omit the modelling framework and we refer the interested reader to that reference [3].

To calibrate the model, we use the Spanish Labour Force Survey, administrative data from the Spanish Employment Service and Spanish administrative data from the "Muestra Continua de Vidas laborales" (MCVL). The calibration sample comes from the 2006 to 2019 waves and includes the complete labour market career for a sample of more than 700,000 workers from the private sector in the 2016–2019 period. This is a reasonable time span for measuring job transitions in steady state, as the annual growth rate is 2.85, a value close to the equilibrium one for the Spanish economy once the "Great Recession" was overcome. All employment (and unemployment) spells lasting more than six (three) months are used. We exclude employees who are not enrolled in the general regime of the Social Security Administration and restrict also the sample to those aged 16–64. We refer the interested reader to García-Pérez and Osuna (2021) for the specific details of the calibration of the model.

The main findings are the following. STW schemes can help prevent a huge increase in unemployment and job destruction in the face of a shock like the COVID-19 crisis. In particular, they are very effective in reducing the temporary job destruction rate, which is sizable when no STW is available due to the large gap in the severance costs between permanent contracts

(PCs) and temporary contracts (TCs). The quantitative effects depend on the degree of subsidization and on the design of the policy. A scenario with a moderate degree of subsidization and where the subsidy is independent of the reduction in hours worked is the least harmful for both welfare and fiscal deficit. However, this is not the scenario that maximizes the number of jobs preserved. A more generous STW scheme, similar to the one implemented in the first year of the pandemic, accomplishes that goal instead. The drawbacks are fiscal sustainability and inefficiencies: these generous subsidies stimulate keeping workers on payroll working very few hours (or even zero hours) that would not be employed in the benchmark situation. Regarding heterogenous effects, we find that more 50% of the workers experience a loss of income and very few workers are better off. The unemployed are the ones who experience the strongest distributional changes. In the heavily subsidized STW scenarios, they are the ones who improve more in terms of the proportion of workers affected and also in terms of the average increase in annual income, but among the losers, they are also the ones who lose more in both respects.

The paper is organized as follows. In Section 2, the literature is reviewed. In Section 3, the details of the Spanish regulation concerning STW schemes are presented. In Section 4, the results are shown. Finally, Section 5 concludes.

## 2. Literature review

During the past decade, there has been an upsurge of interest in STW among economists, mainly because of the widespread use of these mechanisms during the Great Recession and, more recently, during the COVID-19 crisis. However, the literature on the theoretical effects of STW is scant. Most authors (Boeri and Brucker, 2011; [Burdett and Wright, 1989](#)) claim that, in the absence of mechanisms that make firms internalize the costs of redundancies, short-term downturns induce excessive layoffs rather than work sharing. [Cooper et al. \(2017\)](#) suggest that STW can reduce this source of inefficiencies, but at the cost of distorting hours worked per employee. [Cahuc and Nevoux \(2017\)](#) claim that experience-rated STW schemes could to some extent reduce these distortions on working hours because employers would prefer to get rid of their employees during unproductive periods to avoid paying the cost associated with STW.

Other authors have focused their attention on the extent of deadweight and displacement effects. Deadweight effects arise when STW schemes subsidize jobs that would have been preserved in the absence of a subsidy. Displacement effects give rise to longer-term inefficiencies when STW schemes preserve jobs that are not viable without a subsidy, hindering the necessary reallocation of workers and future growth. For instance, [Balleer et al. \(2016\)](#), claim that changes in the discretionary component of STW mainly subsidize workers that would not have been fired anyway. [Cahuc et al. \(2021\)](#) find that STW may save jobs in firms hit by strong negative revenue shocks, but not in less severely-hit firms, where hours of work are reduced, without saving jobs. They also find windfall effects, which increase the cost of the policy per job saved.

Concerning the theoretical effects on welfare, [Braun and Bruegemann \(2017\)](#) find that STW substantially improves welfare by mitigating distortions caused by unemployment insurance, but only if firms have access to private insurance and [Niedermeyer and Tilly \(2017\)](#) find that welfare gains are modest because workers who would have been laid off when no STW is available are workers for whom the earnings loss associated to unemployment is low.

Regarding the empirical literature on the effectiveness of STW, most papers have focused on the Great Recession and only a few deal with the COVID-19 crisis. Macroeconomic evaluations using cross-country analysis tend to find positive effects of STW on employment ([Boeri and Bruecker, 2011](#); [Cahuc and Carcillo, 2011](#); [Hijzen and Venn, 2011](#); [Hijzen and Martin, 2012](#); [Balleer et al., 2016](#); [Brey and Hertweck, 2020](#)). Microeconomic

evaluations using firm-level or administrative data document mixed effects, sometimes due to problems of selection bias. [Calavrezo et al. \(2010\)](#) for France, [Bellmann and Gerner \(2011\)](#) and [Kruppe and Scholz \(2014\)](#) for Germany and [Arranz et al. \(2021\)](#) for Spain, find either no effect or negative effects of STW on employment. For instance, [Arranz et al. \(2021\)](#) estimate a negative probability of remaining working with the same employer after participating in an STW scheme. Conversely, [Balleer et al. \(2016\)](#) put the emphasis on the rule-based component of STW acting as an automatic stabilizer and [Arranz et al. \(2018\)](#) adds that discretionary policy changes can be effective in the short run, but that they lose their ability when the decline in demand is more permanent. [Boeri and Bruecker \(2011\)](#) find positive but temporary effects as well and point to large deadweight effects. More recently, [Kopp and Siegenthaler \(2021\)](#) report evidence that the Swiss STW programme prevents rather than postpones layoffs. By contrast, [Giupponi and Landais \(2020\)](#) find that the Italian scheme is more prone to displacements by postponing dismissals rather than preventing them. [Cahuc et al. \(2021\)](#) complement this literature by focusing on the heterogeneous effects of STW and document large windfall effects.

The empirical literature has also highlighted the significant role played by the interaction between labour market institutions and STW. For instance, [Brenke et al. \(2013\)](#) link the astonishing results of the German STW programme to the existence of stringent employment protection and a high degree of downward nominal wage rigidity because of collective bargaining. Also, [Balleer et al. \(2016\)](#) and [Cahuc and Carcillo \(2011\)](#) find that STW schemes are likely to have more of an impact in the presence of relatively large fixed costs per worker, such as high firing costs, which increase the relative costs of external adjustment, whereas generous unemployment benefits would operate in the opposite direction. More recently, [Lydon et al. \(2018\)](#) have corroborated these findings and have added that STW is more likely to be used by firms with high degrees of firm-specific human capital.

Concerning workers' heterogeneous effects, [Hijzen and Venn \(2011\)](#) warn about the increase in labour market segmentation induced by STW measures and [Cahuc and Carcillo \(2011\)](#) about the perverse consequences on the prospects of outsiders if STW is used too intensively. Furthermore, [Niedermeyer and Tilly \(2017\)](#) find that STW is increasing in tenure and [Lydon et al. \(2018\)](#) show that firms using these schemes are significantly less likely to lay off permanent workers in response to a negative shock. In contrast, [Scholz \(2012\)](#) finds that fears that STW is mainly applied to a certain group of workers are not confirmed. In a recent paper, [Arranz et al. \(2019\)](#) describe the attributes of workers involved in STW, finding that the participation in these schemes in the Great Recession would have been even greater without the workers' compositional changes that occurred between the two recessions studied. In the context of the COVID-19 crisis, [Adams et al. \(2020\)](#) find that college-educated workers still in work were less likely to experience a fall in their earnings compared to workers without a college degree, and that women and the young were more likely to lose their jobs because STW is less prevalent among them. [Dolado et al. \(2020\)](#) review the experience of the Spanish labour market during the COVID-19 episode and corroborate these findings.

To the best of our knowledge, the effectiveness of STW policies in dual labour markets, using a dynamic macroeconomic model of the search and matching type, has only been analysed in [García-Pérez and Osuna \(2015\)](#). As shown above, the previous literature has highlighted the relevance of dynamics, labour market institutions and workers' heterogeneity to understand workforce adjustment decisions in the face of negative shocks, especially when firms' human capital is relevant. In addition, the final word on the effects on labour market segmentation has not been spoken yet. This implies that we are bound to

study the distributional effects if we want to understand the welfare effects of these policies for the Spanish labour market[4]. On one hand, the availability of STW schemes may make firms more prone to convert TCs into PCs because of the possibility of adjusting working hours instead of adjusting permanent employment, which is very costly. In a similar vein, the job finding probability for the unemployed is likely to be greater. On the other hand, as [Hijzen and Venn \(2011\)](#) have pointed out, firms may end up using these measures only for workers on PCs and use TCs to adjust employment because they are very cheap. For these reasons, modelling dynamics is key.

The closest models to ours are [Balleer \*et al.\* \(2016\)](#) and [Cahuc \*et al.\* \(2021\)](#). They study the effectiveness of publicly subsidized STW policies in the context of the Great Recession using a structural macroeconomic search and matching model with endogenous separation. Our model mostly agreed with their results. In some of the STW scenarios studied in our paper, deadweight costs are not negligible, which suggests that the excessively generous subsidies provided during the COVID-19 crisis in Spain were in some cases unnecessary. The main difference between those models and ours lies in the specific way in which we model the labour market and on the focus. As stressed before, the modelling of a dual labour market, with two types of contracts (PCs and TCs) is essential to study the effectiveness and the welfare consequences of these policies for the Spanish case. In addition, adding a rich institutional structure is key to capture the functioning of the Spanish labour market regulations. Therefore, we contribute to this literature by showing the effects of STW schemes in different scenarios and by explicitly addressing the distributional consequences in the context of the COVID-19 crisis, taking as a benchmark a dual labour market like the Spanish one.

### 3. Short-time work regulation in Spain

Since its inception in 1980, the Spanish labour code encompassed a specific regulation on procedures for temporary workforce adjustments, either for business-related reasons or exceptional circumstances, which included thresholds for the minimum workers affected, a minimum period of consultation with worker's representatives, the administrative approval by the legal authority, the responsibility to pay full employers' social security contributions and workers' rights to receive partial unemployment compensation. In 1994, some minor changes towards the simplification of these procedures were added, but it was not until the Great Recession that these policies received more attention and more substantial changes were introduced in the 2009, 2010 and 2012 labour market reforms.

Royal Decree Law (RDL) 2/2009 and the subsequent Law 27/2009 established a 50% subsidy on employers' social security contributions with a maximum of 240 days coverage to stimulate the use of these schemes and changed the regulation concerning unemployment benefit rights. The 2010 labour market reform, by means of RDL 10/2010 and Law 35/2010, made explicit the differences between TL and reduction in working hours, the so-called "Expedientes de Regulación de Empleo Temporal" (ERTEs), rolled forward the subsidy on employers' social security contributions until December 2011, even increased the subsidy to 80% if the firm organized training activities for the affected workers, and reduced the number of months from 12 to 6 the firm was obliged to keep workers on payroll (otherwise, the firm would had to reimburse the subsidies granted on employers' social security contributions). The main novelty introduced in these procedures, as part of the 2012 labour market reform, was the removal of the administrative approval by the labour authority (RDL 3/2012 and Law 3/2012). The underlying idea was to give more power to the firm by minimizing the intervention of the labour authority and the bargaining power of workers' representatives. In addition, these procedures were located within the legal rules related to

internal flexibility measures, so that they became clearly distinguished from the procedures of collective dismissals. To stimulate the use of these schemes a 50% subsidy on employers' social security contributions for a maximum of 240 days was granted, provided the worker remains in the firm at least one year after the procedure was over. These subsidies were available from January 2012 till December 2013.

The COVID-19 crisis has renovated the interest on these schemes. The first regulatory changes were introduced in RDL 8/2020 on "Urgent measures to tackle the socio-economic impact of COVID-19 crisis" to face the economic and social impact of the crisis. This norm encompassed extraordinary and temporary measures to save jobs and to protect workers and firms. RDL 8/2020 adapted the STW mechanism of "force majeure" by broadening this concept to take in activities that were not obliged to continue under the legislation enacted with the State of Emergency, but that were experiencing difficulties to maintain the usual level of activity due to the restrictions imposed by the authorities [5]. In the case of STW for economic, technical, organizational and production-related (ETOP) reasons linked to COVID-19, the procedure was streamlined by reducing the consultation period and the period to approve the measures by the legal authority. Apart from the adaptation of these procedures to these special circumstances, employers were exempted from paying on average 75% of the Social Security contributions for those workers temporarily laid off or working a reduced number of hours with the commitment of keeping the job-worker match at least during six months after the STW procedure [6]. In addition, the government decreed extraordinary measures regarding unemployment benefits, such as the recognition of the right to receive unemployment benefits even if workers had not met the minimum contribution period, and the preservation of workers' right to receive the full amount of accumulated unemployment benefits in case of a subsequent dismissal.

Throughout the year 2020 and beginning 2021 some additional norms have been enacted rolling forward the procedures put in place and adapting them and the degree of subsidization to the evolving situation and the particular sectors or territories. For instance, RDL 15/2020 allowed a "partial" force majeure procedure for some specific activities and RDL 2/2021 made easier the move from an "ERTE of impediment" to an "ERTE of limitation" without having to initiate a new process. These subsequent decrees (RDL 15/2020, RDL 18/2020, RDL 24/2020, RDL 30/2020 and RDL 2/2021) were agreed with the social actors in the so called "Social Agreement for Saving Employment" (Acuerdo Social en Defensa del Empleo). These schemes have not only prevented the loss of workers' incomes and job destruction but also allowed the restart of business activity to the extent permitted by the authorities (CES, 2021).

#### 4. Main findings

Section 4.1 shows the steady-state effects of the type of STW schemes that have been implemented in Spain during the COVID-19 crisis in different scenarios. Section 4.2 reports the welfare implications, the cost of these policies and the distributional effects.

##### 4.1 Steady-state effects

Table 1 shows the steady-state effects of the COVID-19 shock for labour market outcomes in several scenarios. We assume that in the baseline the aggregate state of the economy is such that there is no need to use internal adjustments mechanisms. In the other scenarios, the aggregate state of the economy is set to a lower value to represent the fall in aggregate demand due to the COVID-19 crisis[7].

In Scenario A, we shut down the possibility of adjusting hours to focus on the effects that would have prevailed if firms could only use the extensive margin. This was the

AEA 30,90	Scenarios	Baseline	(A) No STW	(B) STW 33% subsidy	(C) STW 80% prop.subs.	(D) STW 65% prop.subs.
	Statistics					
254	$u$	13.7	41.9	29.0	19.4	25.4
	$u_{equiv}$	13.7	41.9	32.2	30.5	30.1
	$JD$	10.8	17.5	12.2	2.6	8.6
	$JDt$	16.8	33.3	22.1	8.9	13.6
	$JDp$	8.2	10.7	8.0	0.0	5.8
	$JD_{d=2}$	22.3	22.4	22.5	6.4	22.4
	$JD_{d=3}$	10.4	29.6	29.5	14.8	10.2
	$JD_{d=4}$	16.1	58.5	10.8	5.2	4.7
	$n_{d=1}$	15.9	27.6	18.1	10.5	14.5
	$n_{d=2}$	12.4	21.4	14.0	9.8	11.3
	$n_{d=3}$	11.1	15.1	9.9	8.4	10.1
	$n_{d=4}$	9.3	6.3	8.8	7.9	9.7
	$n_{d=5}$	8.8	5.9	7.4	7.9	8.9
	$n_{d=6}$	8.1	5.0	7.7	7.9	8.1
	$n_{d=7}$	7.3	4.1	7.0	7.9	7.3
	$n_{d=8}$	6.6	3.4	6.4	7.9	6.6
	$n_{d=9}$	6.0	3.2	5.7	7.9	5.9
	$n_{d=10}$	5.4	2.9	5.2	7.9	5.9
	$n_{d>10}$	9.2	5.1	8.8	15.8	11.8
	$n_{d>3}$	60.6	35.9	58.0	71.3	64.1

**Table 1.**  
Steady-state effects

**Notes:**  $u_{equiv}$  stands for unemployment measured in full-time equivalents.  $JD_{d=i}$  stands for job destruction at the beginning of period  $i$ .  $n_{d=i}$  stands for the proportion of workers in period  $i$

predominant way to adjust the workforce before the Spanish labour market reforms of 2009, 2010 and, more importantly, 2012 changed the regulations concerning these procedures. In Scenario B, firms can use both, TL and STW and payroll taxes are subsidized by 33% [8]. This was the available STW scheme in the period January 2012–December 2013 in response to the Great Recession [9]. Finally, in Scenarios C and D, payroll taxes are reduced in the same proportion as hours worked and they are also subsidized. This type of STW scheme was introduced in a number of countries during the Great Recession to provide more incentives to adopt these types of measures (Arpaia *et al.*, 2010). Payroll taxes are heavily subsidized in Scenario C to match the average degree of subsidization during the COVID-19 crisis in 2020: an 80% subsidy in case of reductions in working hours and a 75% subsidy in case of TL. In Scenario D, these subsidies are reduced to 65% and 55%, respectively, to illustrate the effects of lower subsidies, similar to the ones that have been proposed for the ongoing months in 2021.

In Scenario A, the unemployment rate increases sharply to 41.9% due to massive firings given the drop in aggregate demand and the impossibility of adjusting hours worked. This rate is similar in magnitude to the rate of unemployment that Dolado *et al.* (2020) have estimated using the methodology of the US Bureau of Labour Statistics. This methodology adds to the official unemployment rate of those workers on STW or temporary laid off. Adding those workers to the official rate is basically the same, in terms of accounting, as precluding the use of these mechanisms, which is what this scenario does. Furthermore, the temporary job destruction rate doubles and the permanent job destruction rate also grows significantly. The most affected workers are those whose TCs expired and are not promoted to a PC. In fact, the job destruction rate on these jobs soars from 16.1% to 58.5%, due to the

large gap in severance costs between PCs and TCs, which prevents firms from promoting more temporary workers to permanent jobs.

The availability of STW schemes induces smaller increases in the unemployment rate. In Scenario B, the rise in both the unemployment and the temporary job destruction rate is not so large. Aggregate job destruction increases hardly two percentage points from the baseline situation. The most striking difference is the change in the job destruction rate once TC expires. Many of the temporary workers who would have been fired in Scenario A, now get promoted to a PC on STW or are temporarily laid off. Regarding workers on PCs, those with the lowest level of qualification and tenure are still fired, some of them are only temporarily laid off and some others are put on STW. For the same level of qualification, the higher the tenure the lower the probability of being subject to those schemes and the lower the reduction in working hours. The fact that some workers work less than usual (or even zero hours on TL) explains why the unemployment rate in equivalent terms is higher than the standard rate of unemployment.

Scenario C shows the effects of heavily subsidizing STW schemes. The unemployment rate increases substantially less, from 13.7% in the benchmark to 19.4%. [Dolado \*et al.\* \(2020\)](#) obtain a similar number (20, 2%) when they consider the “out of the labour force” and those that “want to work and available to work” for the computation of the unemployment rate. Regarding the job destruction rates, the generous subsidies provided make firms more prone to keep workers on the payroll, albeit working fewer hours (or even zero hours) in some instances. Note that in Scenario B, the reduction in payroll taxes is independent of the reduction in hours worked, whereas in Scenarios C and D, the reduction in payroll taxes is proportional to that, thereby creating an incentive to preserve more short-time jobs. In fact, job destruction rates are much lower in Scenarios C and D but at the expense of significantly reducing working hours and keeping workers on the payroll who would not be otherwise employed. This effect is more prevalent in Scenario C than in Scenario D due to the more generous subsidies. In Scenario C, almost one-third of the adjustment is made using TL while they barely represent one-fourth in Scenario D and only 17% in Scenario B. This explains why the difference between the unemployment rate in equivalent terms and the standard rate of unemployment is much higher in Scenario C.

In regard to the effects on job destruction rates in the early durations,  $JD_{d=2}$ ,  $JD_{d=3}$  and  $JD_{d=4}$ , they decrease dramatically to 6.4%, 14.8% and 5.2% in Scenario C. Consequently, the tenure distribution changes drastically becoming much smoother. The proportion of workers with more than 10 years of tenure increases from 9.2% in the benchmark scenario to 15.8% and the proportion of workers with more than three years of tenure increases from 60.6% to 71.3% in this case. In contrast to what [Hijzen and Venn \(2011\)](#) find, STW schemes reduce labour market segmentation.

To summarize, the possibility of putting workers on STW or using TL help prevent firings when firms are hit by negative shocks. Adding this internal flexibility mechanism implies lower unemployment, lower aggregate and temporary job destruction rates and a smoother tenure distribution. This exercise also shows that external and internal flexibility, when combined, do not necessarily prevent a larger increase in the unemployment rate than when only the external flexibility is available, at least in full-time equivalents. Moreover, in some scenarios, the generous subsidies generate inefficiencies because they induce firms to keep some workers on the payroll, either through TL or working very few hours, that would not be otherwise working in the benchmark case.

4.2 Welfare effects and fiscal costs

As it is well-known, an assessment of a policy cannot be conducted based on steady-state comparisons. To assess the welfare consequences of these policies, a transition exercise is performed. For this purpose, we take a sub-sample of workers from the MCVL data set previously described in the year 2019, who differ in several dimensions, such as whether they are employed or unemployed, the type of contract, tenure on the contract and productivity level (proxied by qualification) and we impose the fall in aggregate demand to compute the changes they experience in terms of employment, hours worked and income in the previous scenarios. We assume that in the first period of the transition no STW policy is available because the RDL 8/2020 that subsidized again STW schemes was not enacted until mid-March 2020. From that period on a particular STW scheme is implemented (B, C or D) until the end of 2020 during three quarters. We also run the transition under the assumption that no STW scheme is available to compare with these cases. In every scenario, workers are subject to the same shocks, but their employment histories are different because the policy rules are different.

Figure 1 shows the evolution of several labour market variables related to the level of employment, unemployment, job destruction, STW and TL in the different scenarios. On average, the number of workers on short-time or temporary laid off over total employment amounts to 7.5% during the first year of the pandemic[10]. The huge rise in the unemployment rate experienced in all cases except in the baseline illustrates the severity of the crisis. Among the STW scenarios, the heavily subsidized one delivers the highest level of employment. However, in equivalent terms, the difference is not really that high. The reason is quite simple. In the heavily subsidized STW scenario, there are more jobs because job destruction is lower, but average hours worked are in comparison to the other two STW scenarios lower. Of course, when no STW is available, unemployment and job destruction rates are the highest because there is no other way to adjust to the adverse shock.

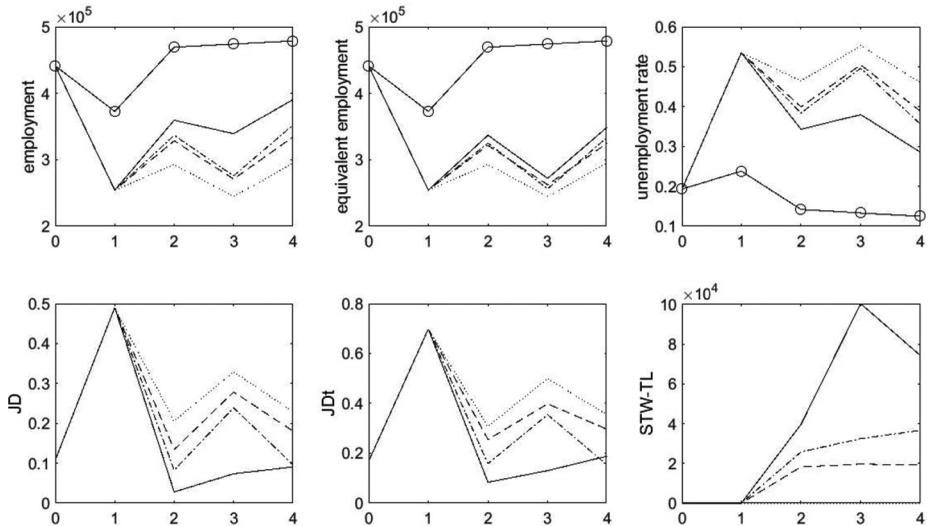


Figure 1.  
The transition

Note: Baseline (circles), STW80 (solid line), STW65 (dashed dot line), STW33 (dashed line), No STW (dotted line)

To evaluate the welfare changes induced by these scenarios, we compute the equivalent variation expressed as an income annuity. We measure the welfare change as the difference in the individual annuity values in two institutional settings. A positive value implies a larger utility in the benchmark situation. For this exercise, Scenario A will be considered the benchmark scenario. The reason is that we want to understand the differences in welfare experienced by similar individuals in an economy where no STW schemes are available (Scenario A) compared to that of an economy where STW schemes are implemented (Scenarios B–D). Furthermore, the change in welfare is expressed in euros, which allows for an easy comparison to the financial calculations discussed below. We obtain an aggregate welfare figure by computing the average of the individual welfare changes across all the individuals in the sample.

To obtain a complete picture, we also compute the net cost that each individual represents for the public system in the different scenarios as a constant annuity to facilitate comparison with the welfare measurement defined above. This cost is assessed by computing the value of the payments that the worker will receive along the transition, net of all contributions to be made in the same period. Our calculation reflects the fact that workers can change their labour state as a result of the exogenous sources of uncertainty in the model and takes also into account that individuals will react optimally according to the institutional environment (Table 2).

In Scenario A, welfare decreases sharply due to the substantial drop in average income (9.6%). Regarding the fiscal balance, the enormous deficit generated is attributable to the huge growth in fiscal costs and the substantial drop in fiscal revenue. These changes are due to the large decrease in the level of employment because of massive firings and the impossibility of adjusting the labour force using the intensive margin. As a result, unemployment benefits and social security contributions paid by the State rise quite significantly and payroll taxes on behalf of firms drop accordingly.

In Scenario B, the drop in average income is substantially lower than in Scenario A (5.8%). This is in part due to fewer firings and to the wage subsidies provided by the State for those workers on STW. Moreover, unlike in the other STW scenarios (C and D), workers on short-time tend to work longer hours affecting income, employers' social security contributions and fiscal revenue in a positive way. Accordingly, the deterioration of the fiscal balance is minor compared to the other scenarios. It is true that the amount of

Scenarios	Baseline	(A)	(B)	(C)	(D)
		No STW	STW 33%	STW 80%	STW 65%
Statistics			Subsidy	prop.subs.	prop.subs.
Equivalent variation	–	–	–498	–174	–184
$SS - cc_{firm}$	3,199	1,897	2,068	2,056	2,027
$SS - u_{firm}$	840	497	548	629	562
$SS - cc_{State}$	572	1,874	1,704	1,716	1,744
Unemploy. benefits	658	2,154	1,914	1,543	1,840
Wage subsidies	–	–	153	808	305
Total fiscal costs	1,231	4,029	3,770	4,067	3,878
Fiscal revenue	4,039	2,394	2,616	2,685	2,589
Fiscal balance	2,809	–1,635	–1,154	–1,383	–1,289
STW take up rate	–	–	4.1	5.9	5.0

**Note:**  $SS - cc_{State}$ ,  $SS - cc_{firm}$  and  $SS - u_{firm}$  stand for social security contributions paid by the State and by firms

**Table 2.**  
Welfare effects and fiscal costs

unemployment benefits is larger than in Scenarios C and D, but wage subsidies are substantially lower in this case because the State does not need to compensate workers so much for the lost hours worked. Comparing the situation with and without STW schemes, people would be willing to pay almost €500 to transition to Scenario B.

In Scenarios C and D, the drop in average income (8.2%) is higher than in Scenario B (5.8%) and the fiscal balance deterioration is worse. Unlike in Scenario B, wage subsidies account for a substantial part of the rise in fiscal costs, particularly in Scenario C. In this scenario, the generous subsidies on payroll taxes and the fact that they are proportional to hours worked induce firms to keep more workers on bill, but working very few hours (or even zero hours on TL). This also explains that fiscal revenue does not fall as much as in the other scenarios and that the amount of unemployment benefits and social security contributions paid by the State do not comparatively account equally to the upsurge in total fiscal costs [11]. Concerning welfare, there are no significant differences between Scenarios C and D: individuals are willing to pay 174 to transition to Scenario C and 184 to transition to Scenario D.

To summarize, considering welfare changes and fiscal deterioration, Scenario B seems to be the least harmful. It is true that more workers get unemployment benefits and that the State needs to satisfy their social security contributions, but the lower amount of wage subsidies more than compensates, and fiscal revenue does not fall comparatively so much because average hours worked are relatively high. However, if the aim is to maximize the number of jobs preserved and minimize unemployment, Scenario C, which is a good approximation of the scenario implemented in the first year of the pandemic, would be preferable. The problem with this scenario, apart from the inefficient number of working hours, is sustainability from a fiscal point of view. This may be the reason why the Spanish Government has decided to cut down the degree of subsidization as the economic situation has improved in 2021. The main effect of this downsizing is the reduction in the amount of jobs on STW or temporary laid off.

To study the distributional consequences of the COVID-19 crisis, we finish our evaluation by providing additional information on the average increase/decrease in annual income with respect to the baseline before the COVID-19 crisis started. We perform this exercise for every worker in the sample and group them according to their employment status at the beginning of the transition (permanent, temporary or unemployed worker).

Table 3 shows that more than 50% of the workers are negatively hit by the crisis in terms of average income. Very few workers are better off, 8% and 6% in Scenarios A and B, respectively, and less than 3% in Scenarios C and D, the rest of the sample being unaffected. This might be surprising, but it is, in fact, the result of the generous work sharing strategy in Scenarios C and D. For the winners, the average increase in annual income is the greatest in Scenario B (€817) because those that have a job tend to work longer hours. For the losers, the average decrease in annual income is substantial, especially in Scenario A, where no STW scheme is available.

According to their employment status at the beginning of the transition, the unemployed experience the strongest distributional changes across all the scenarios studied. In Scenario A, almost three quarters of the unemployed suffer a loss of income of €2,788 on average. Permanent and temporary workers also suffer a substantial decrease in average income, but the proportion affected is not that large, 43.6% and 63.8%, respectively.

In Scenario B, the winners are concentrated among temporary workers and the unemployed with similar proportions, 9.0% and 8.0%, respectively. Among the winners, temporary workers experience the highest increase in income because of their better prospects in terms of preserving a temporary job and promoting to a permanent one

	All		Permanent		Temporary		Unemployed	
Scenario A	%	Mean	%	Mean	%	Mean	%	Mean
↑ income	8.0	679	8.8	402	7.9	1,113	6.4	918
↓ income	55.0	2563	43.6	2418	63.8	2570	73.0	2,788
Scenario B								
↑ income	6.0	817	3.7	454	9.0	1,083	8.0	830
↓ income	54.9	2256	46.5	2068	59.2	2,283	71.5	2,555
Scenario C								
↑ income	2.4	331	1.2	306	2.6	274	5.7	382
↓ income	62.6	2,084	56.3	1,867	65.8	2,054	75.3	2,563
Scenario D								
↑ income	2.7	335	1.6	335	2.8	270	5.4	383
↓ income	57.2	2,279	50.2	2,083	61.8	2,268	69.3	2,679

**Notes:** The columns with the percentage change sign indicate the percentage change of workers experiencing the change indicated with the arrows on the left with respect to the baseline. The numbers below “Mean” indicate the average increase/decrease in income (in euros)

**Table 3.**  
Winners and losers

compared to other scenarios. On the contrary, in the heavily subsidized STW scenarios (C and D), the unemployed are the ones who improve more in terms of the proportion of workers and also in terms of the average increase in annual income. This is because of the higher probability of getting a job (although on short-time) and of, subsequently, promoting to a permanent job where, on average, income is higher than on unemployment. Among the losers, the unemployed are also the ones who lose more in both respects. The unlucky ones, those that do not find a job, have less chances of getting one because of the huge labour hoarding induced by this generous STW scheme compared to the baseline situation.

## 5. Conclusion

We have studied the type of STW schemes that have been implemented in Spain during to COVID-19 crisis. The objective has been twofold. Firstly, we have shown the steady-state effects of the COVID-19 shock on labour market outcomes under several STW scenarios. And secondly, we have performed a transition exercise to evaluate the changes in welfare, the costs of these policies and the distributional effects.

The main finding is that the COVID-19 crisis would have generated a 42% unemployment rate in the absence of STW mechanisms. Because of the generous STW scheme introduced in March 2020, unemployment and job destruction rates have only increased moderately. These heavily subsidized schemes have provided incentives to preserve workers on payroll working very few hours (or even zero hours) and, in some cases, have generated inefficiencies. According to our analysis, a scheme with a moderate degree of subsidization and with subsidies independent of the reduction in hours worked, similar to the STW scheme introduced in the Great Recession, would have been better from a welfare point of view and more cost-effective. The price of that strategy would have been a higher unemployment rate.

Regarding the distributional consequences, in all the scenarios studied more than 50% of the workers are negatively hit by the crisis in terms of average income and very few workers improve. The unemployed experience the strongest distributional changes. In the more generous STW scenarios, they are the ones who improve more, in terms of the proportion of workers and also in terms of the average increase in annual income. But, among the losers, they are also the ones who lose more in both respects.

One may be wondering why the Spanish Government decided to implement an STW scheme considerably more generous than the one implemented in the midst of the Great Recession, which according to our analysis is less harmful from a fiscal and a welfare point of view. It is very likely that the government has given priority to preserving jobs instead of income to prevent the unemployment rate from escalating to frightening figures, which could have generated political instability. Or it may be the case that the government has received pressures from social actors, such as unions or business associations or even from international organizations. The reasons behind this choice are out of the scope of this paper because that kind of analysis would require a politico-economic model [12].

Be that as it may, keeping the unemployment rate under control in the context of a generous STW scheme is just an illusion. The unemployment rate is not really a good indicator of the severity of the crisis. It does not include the workers officially on STW and those that have transitioned to out of the labour force because they are unable to find a job. Maintaining a doped economy for a long time is also a problem for fiscal sustainability. This is probably why the Spanish Government has started to progressively cut down the degree of subsidization and provide incentives to recall workers, once the economy has shown signs of recovery. We think the main lesson from this analysis is that, in the face of a crisis like the one we have encountered, STW schemes coupled with moderate subsidies on payroll taxes may be a suitable instrument to cushion the impact of unforeseen transitory demand shocks, as long as they do not require occupational or sectoral job reallocation.

#### Notes

1. For the sake of brevity, under the term STW schemes we must understand both TL and reductions in working time.
2. See [Del Rey Guanter \(2010\)](#), [Garrido Pérez \(2012\)](#) and [García Serrano \(2015\)](#) for a detailed description of these labour market reforms.
3. See also [García-Pérez and Osuna \(2021\)](#) for the latest version of the model.
4. According to the Eurostat, the share of temporary workers over total employment in the past decade was 20.7% in Spain, whereas it was only 11.8% in the EU.
5. Cancellation of activities, temporary closures of spaces with a large influx of public, restrictions on public transportation, mobility restrictions of goods, services and persons, lack of supplies and confinements measures.
6. The exact amount of the exemption depends on the number of workers in the firm, on whether the procedure involves a TL or a reduction in working hours, on whether the business activity is restarting or remains suspended, on the sector of activity and on the type of ERTE (force majeure, ETOP, impediment or limitation).
7. The aggregate shock is set to 1 in normal times, and it is calibrated to a lower value, 0.91, such that the model reproduces the annual rate of variation of aggregate consumption due to the COVID-19 crisis in 2020.
8. In the model firms have the option of reducing hours worked by 30% or 60% depending on the magnitude of the adverse shock or even to zero by using TL.
9. Strictly speaking, the subsidy amounted to 50% of payroll taxes for a maximum of 240 days, which implies a 33% subsidy on an annual basis.
10. Using data provided by SEPE and the Spanish Labour Force Survey, this number amounts to 6.5%.

11. Similar to [Kopp and Siegenthaler \(2021\)](#) the savings from reduced unemployment benefit payments to some extent compensate the payments related to STW.
12. See [Thelen \(2014, chapter 4\)](#) for a comprehensive politico-economic discussion of labour market policies supporting insiders (STW) or outsiders (Active Labour Market Policies).

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