Policy Watch

The Impact of the 2012 Spanish Labour Market Reform on Unemployment Inflows and Outflows: a Regression Discontinuity Analysis using Duration Models

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Abstract

This paper studies the impact of the 2012 Spanish labour market reform on the probability of exiting and entering unemployment using a regression discontinuity approach based on duration models. The 2012 reform modified important aspects of hiring and dismissal procedures in Spain. By doing so, it affected the probability of exiting both unemployment and employment. Comparing labour market performance before and after February 2012 and using a competing risk duration model for the exit from both unemployment and employment, we find that the reform contributed to employment creation in two ways. First, it increased the likelihood of exiting from unemployment to employment by increasing the monthly transition to permanent employment from 1.7% to 2.6%, on average, for the first twelve months of unemployment. Second, it reduced the probability of exiting from employment for workers on a temporary contract, particularly at small firms, most likely because the firms were using newly introduced internal flexibility measures to adjust the workforce instead of using external flexibility measures. The direct transition from temporary to permanent positions was also eased by the reform. Finally, we do not find any significant effect of the reform on the dismissal patterns for permanent workers. These findings point to a positive effect of the reform in dampening the widespread segmentation of the Spanish labour market, although the impact is so far small, which means that more effort will be needed to substantially reduce the strong duality of this labour market.

Keywords: Labour reform, discontinuity design, unemployment hazard rate, employment hazard rate.

JEL Classification: J41, J64, C41

1. Introduction

Labour market duality is one of the most acute problems in many OECD labour markets. A high degree of segmentation arises because a group of workers has permanent or open-

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ended contracts, whereas another group has temporary contracts or other non-standard forms of employment. This second group of workers has much lower employment protection than does the first because they are hired under contracts with lower dismissal costs (or even non-existent at the end of a temporary contract). Thus, they face much less job security in their workplace. These large differences in regulation make temporary workers the most affected by labour market adjustments because they are the first to lose their jobs and suffer long unemployment spells (see Boeri (2011) for a synthesis of these arguments). This phenomenon is particularly acute in times of a major downturn, which in turn further increases labour market segmentation. Dual labour markets are partly the result of introducing labour market flexibility by increasing the use of non-standard employment contracts rather than adapting the regulation of regular contracts and have intensified in recent decades (Saint-Paul, 1996, 2002). The most vulnerable, lower-skilled workers and the young, have been affected the most. Spain is a paradigmatic example of a country that, since the 1980s, has reformed its labour market at the margin, introducing flexibility by liberalizing non-standard employment contracts. Even before the crisis, Spain was an extreme case of duality (Bentolila *et al.*, 2012).

Many OECD countries reformed their labour markets in the wake of the crisis, in part to reduce their extreme duality. Most reforms attempted to address this divide by restricting the use (or increasing the cost) of temporary contracts, easing regulations for the termination of permanent employment contracts and/or increasing the convergence of termination costs across contracts (OECD, 2014b). Spain has also tried using those instruments to reduce this extreme duality by reforming its labour market after the crisis. In 2010, a first labour reform was introduced that facilitated the use of a reduced severance pay of 33 days of wages (instead of 45 days) per year of seniority for permanent contracts in the case of wrongful dismissal. In addition, the reform expanded the conditions under which a dismissal for objective reasons could be justified. In such a case, the employer would pay 20 days of wages per year of seniority. Finally, the reform also introduced a subsidy equivalent to 8 days per year of service for dismissals at firms with fewer than 25 employees. A second labour reform was undertaken in February 2012. First, the reform prioritized collective bargaining agreements at the firm level over those at the sector or regional level, made it easier for firms to opt-out of a collective agreement, and implemented internal flexibility measures as an alternative to job destruction. Second, it modified Spain's dismissal regulation provisions, in particular clarifying the definition of fair economic dismissal and reducing monetary compensation for unfair dismissal. In addition, a new permanent contract for full-time employees in firms with 50 or fewer employees was introduced ('*Contrato de Apoyo a Emprendedores*') with reduced social security contributions and an extended trial period of one year.

Since its adoption in 2012, wage adjustments accelerated, and after some months of job destruction, employment began to grow. By the end of 2015, the overall balance in terms of jobs was positive; 350,000 new jobs existed since the 2012 reform was passed, but there remained 2 million jobs fewer than before the Great Recession began in 2008. A first evaluation of the reform concluded that it prevented the destruction of approximately 60,000 jobs in the short term, helping to reduce the unemployment rate by as much as 0.6 percentage

points (BBVA, 2013). A more comprehensive evaluation exercise performed by the OECD and analysing both wages and labour market flows concluded that the reform was able to increase the rate of hiring by 8% primarily by increasing the hiring of permanent workers and by not changing the pattern of firing of these workers (OECD, 2014a)[1].

Given the extreme duality of the Spanish labour market and the depth of the reform undertaken in 2012, Spain is a good country in which to study how labour market reforms undertaken after the crisis have affected the segmentation of the labour market. Hence, the objective of this paper is to study the effects of the 2012 Spanish labour market reform on the probability of exiting both unemployment and employment using duration models. We implement this policy evaluation exercise by estimating a discrete time duration model for the exit rates from unemployment to employment and from employment to unemployment. Using information on a sample of more than 200,000 workers employed and unemployed in Spain between 2003 and 2014 and applying a discontinuity design identification strategy (Hahn *et al*., 2001), we try to identify the time change in the probability of exiting both unemployment and employment that can be attributed to the effect of the labour market reform adopted in Spain in February 2012[2]. The estimation of duration models to study the conditional probability of leaving employment and unemployment for each duration is a good means of establishing whether the reform has improved the probability of finding stable employment (if unemployed) or maintaining existing employment (if employed). These flow probabilities capture in a much better way the evolution of the labour market and provide more insight than analyses of the stock of employment and/or unemployment.

Our analysis studies the impact of the Spanish labour market reform up to 36 months after the reform (up until the end of 2014), covering periods of both net employment destruction (2012-2013) and net employment creation (2014). Our analysis thus extends and substantially improves the preliminary assessment included in OECD (2014a), which included data for only 2012 (that is, only 10 months after the reform was approved). Hence, our identification strategy is not only better supported by the data but also more able to infer the medium-term impact of the reform including a period with net employment creation. Furthermore, compared to that initial evaluation, we also analyse the effects of hiring incentives and extended trial periods introduced by different provisions of the reform that affected only firms below a certain threshold, a point still not answered in the evaluation of the 2012 labour market reform. In particular, we study the effect of the reform in establishments of different sizes to see whether the new specific permanent employment contract available for firms with 50 or fewer employees, which included hiring incentives and an extended trial period of one year, has encouraged more such firms to offer a permanent contract following the reform. In addition, we are interested in the effects of the reform on different groups of individuals – men/women, young/old, long-term/short-term unemployed – who are affected differently by the high degree of fragmentation of the labour market and whom the reform might have affected differently.

Our main results point to small but positive effects of the 2012 reform on exits from both unemployment and employment. First, we find that the reform increased the likelihood of

exiting from unemployment to employment by causing the monthly transition to permanent employment to increase from 1.7% to 2.6%, on average, for the first twelve months of unemployment. Second, it reduced the probability of exiting from employment for workers on a temporary contract, which we interpret as a sign that firms used newly introduced internal flexibility measures instead of external measures to adjust the workforce. We find also that the reform facilitated job-to-job transition from temporary to permanent positions. On average, this transition increased from 0.3 to 0.4% due to the reform, which is another positive outcome given that it is an additional and even more efficient source for reducing duality as no unemployment occurs during this transition. Finally, we find no significant effect of the reform on exiting from permanent employment, which we interpret as evidence that the reduction in dismissal costs for permanent workers was compensated for by the availability of flexibility measures providing an alternative to a dismissal.

The rest of the paper is organized as follows: the following section summarizes the 2012 labour market reform, section 3 describes the empirical strategy, section 4 summarizes our main results, and section 5 concludes.

2. 2012 Spanish labour market reform

The 2012 labour market reform was a comprehensive set of measures approved in February 2012 as *Real Decreto Ley 3/2012* that modified important aspects of labour market regulation. We will briefly summarize the main aspects of the reform that could affect the flows analysed in the empirical analysis, in particular collective bargaining rules, dismissal regulations and hiring procedures. A more complete description of the main changes introduced can be found at OECD (2014a) and at ILO (2014).

Collective bargaining procedures were modified to prioritize agreements at the firm level above those at the sector or regional level so that their contents could adjust more closely to the specific needs of a firm. Firms could also more easily introduce internal flexibility measures, including changes in working conditions (e.g., wages and working hours), even unilaterally, whenever there were specific objective reasons. In addition, those collective bargaining agreements that expired could only be prolonged for one year after their end date, limiting to 12 months the so-called period of "ultractividad". All of these changes in collective bargaining were intended to allow employers to use internal flexibility measures more often as an alternative to dismissals in the presence of adverse economic shocks.

Dismissal legislation was substantially modified to clarify the reasons for carrying out collective and individual dismissals and to reduce the monetary compensation for both fair and unfair dismissals. The reform redefined the conditions under which an objective justified dismissal could be carried out, including precise economic, technical, organisational and production-related reasons. As a consequence, employers would be able to pay the monetary compensation for a fair dismissal (20 days' wages per year of seniority) in a wider range of

situations. The monetary compensation for unfair dismissal was also reduced, from 45 days' wages per year of seniority to 33 days' wages per year of seniority. The maximum compensation in case of unfair dismissal was also set at a maximum of 24 months' wages, compared with the previous maximum severance pay of 42 months' wages.

In addition, the reform eliminated a fast-track dismissal procedure ('despido express') that allowed the employer to declare a dismissal unfair and pay upfront the correspondent severance payment, without paying interim wages (which were also removed). This procedure was widely used previously by employers, as declaring a dismissal fair was more difficult and interim wages had to be paid between the date of dismissal and the final court decision.

Concerning collective dismissals, the reform eliminated the requirement for administrative authorization for collective redundancies but maintained the obligation of good-faith negotiations with unions before serving individual notice, in line with current legislation in most OECD countries. The elimination of the requirement for administrative authorization led to some confusion under which conditions collective dismissals could be undertaken, and more legal disputes arose the months following the reform[3]. Finally, with respect to hiring procedures, a new full-time permanent contract for small firms (under 50 employees) was created (Contrato de Apoyo a Emprendedores) that includes several hiring incentives and fiscal rebates for firms under 50 employees and allows an extended trial period of one year[4]. In addition, the reform extended the existing subsidy equivalent to 40% of ordinary severance pay (8 days per year of service, paid by a wage guarantee fund – FOGASA) to all cases of fair dismissal in the case of firms with fewer than 25 workers[5].

3. Empirical strategy

Transitions between unemployment and employment are analysed using the *Muestra Continua de Vidas Laborales* (MCVL). This longitudinal dataset from social security registers covers employment histories of over one million individuals, making it a very good data source to study worker transitions out of unemployment. The MCVL covers approximately one in twenty persons registered for social security and is representative of the whole population that had a relationship with social security in a given year[6].

These data are used to study the impact of the reform on both the hazard rate out of unemployment and the one for exiting from employment to unemployment by using a discrete-time competing-risk duration model[7]. The empirical strategy followed is similar to the one followed in García-Pérez and Munoz-Bullón (2011).

The probability of exiting unemployment after a spell of duration *d* to enter either temporary employment or permanent employment is simultaneously estimated for the two types of exits within a competing-risk framework. Both possible transitions are modelled using a logistic distribution as given by the following:

$$\Pr(U_{it} = d, L_{it} \,|\, U_{it} \geq d) =$$
$$F(\alpha_0 + \alpha_1 \ln(U_{it}) + \alpha_2 \ln(U_{it})^2 + \alpha_3 \ln(U_{it})^3 + \alpha_4 X_{1it} + \alpha_5 X_{2it} + \alpha_6 X_{1it} * \ln(U_{it}) + \alpha_7 prevempl_{it}$$
$$+ \gamma FEDEA_t + \beta_1 \Delta \log E_{jt} + \beta_2 \Delta \log E_{jt} * \ln(U_i) + \delta_0 I_{t>R} + \sum_{s=1}^{N} (\lambda_s + \delta_s I_{t>R})(t - R)^s + m_t) \tag{1}$$

where $ln(U_{it})$ represents the logarithm of the unemployment duration for individual i, which terminates in month t. L_{it} represents the type of contract under which they are hired upon exiting unemployment, and X_1 refers to the following individual characteristics: age, education categories[8], and an indicator of whether the individual receives unemployment benefits. These characteristics are also included in interaction with the duration of the unemployment spell. X_2 stands for individual controls for gender, migrant status and region, whereas prevempl comprises a set of dummies controlling for previous employment sector of activity[9], the number of times the individual has been unemployed and the percentage of time he has been employed throughout his labour market career. The economic cycle is controlled by using the FEDEA index of economic activity at the national level and the change in log employment at the provincial level ($\Delta logE$). R is the moment at which the reform is approved (February 2012). Therefore, $I_{t>R}$ is a binary variable that covers the reform's effect, being equal to 1 from February 2012 onwards and equal to 0 prior to that date. The trend of the series analysed is specified as a polynomial of N terms and is allowed to have different coefficients before and after February 2012 by means of interaction terms with the variable $I_{t>R}$. Finally, m represents the monthly binary variables, which are covered by seasonal dummies.

The exit from employment to unemployment is modelled similarly. Equation (2) presents its specification, where J refers to the duration of the employment spell, which ends at time d for the worker i. The unique difference with respect to equation (1) is that the duration dependence of this hazard rate includes, apart from a polynomial in log duration, a set of dummies that control for labour contract duration of specific months (6, 12, 24 and 36).

$$\Pr(J_{it} = d \,|\, J_{it} \geq d) =$$
$$F(\alpha_0 + \alpha_1 \ln(J_{it}) + \alpha_2 \ln(J_{it})^2 + \alpha_3 \ln(J_{it})^3 + \alpha_4 X_{1it} + \alpha_5 X_{2it} + \alpha_6 X_{1it} * \ln(J_{it}) + \alpha_7 ContractDur_{it}$$
$$+ \gamma FEDEA_t + \beta_1 \Delta \log E_{jt} + \beta_2 \Delta \log E_{jt} * \ln(J_i) + \delta_0 I_{t>R} + \sum_{s=1}^{N} (\lambda_s + \delta_s I_{t>R})(t - R)^s + m_t) \tag{2}$$

Equations (1) and (2) are estimated for a sample of Spanish workers aged 16-64 in 2003-2014 (2006-2014 for the subsample differentiating by establishment size)[10]. Transitions from unemployment to employment are conditional on being unemployed for at least fifteen days, and durations are censored at 36 months of unemployment – that is, those spells lasting more than 36 months are considered censored at the 36th month[11].

The basic identifying assumption implies that, conditional on the controls included in the model, entry or exit from unemployment of a group of individuals is smooth over time and that any change or discontinuity in the series can be attributed to an exogenous change that occurred at that point in time (see Hahn *et al*., 2001). Specifically, we will assume that

any observed change around February 2012 is due to the labour market reform, which was implemented on that date. However, in January 2012, the National Agreement for Employment and Collective Bargaining occurred[12]; therefore, part of the effect we find might also be due to this agreement. We believe, however, that this partial effect is quite unlikely because this agreement was only a guideline to employers and trade unions and was related mostly to wage conditions and firms' internal flexibility in *future* collective agreements.

Obviously, misspecification of the empirical model might lead to identifying a discontinuous shift in performance near the date of a reform, even when such a shift occurs before the reform (and cannot therefore be attributed to it). To validate the empirical model, therefore, placebo tests must be run. Thus, we run placebo tests that "anticipate" the date of the reform to December 2011, September 2011, June 2011 and March 2011. A second issue concerns possible manipulations around the threshold. For example, if the introduction of the *Contrato de Apoyo a Emprendedores* were anticipated, employers eligible for the subsidy could delay hiring until after the reform to enjoy the subsidy. However, the details and the breadth of the reform were never mentioned during the national election campaign in 2011. It is therefore reasonable to assume that if threshold manipulation occurred, that is, if firms postponed certain choices until the approval of the reform, this phenomenon concerned, at worst, only the period January to March 2012. To test for this bias, the baseline models will be re-estimated, excluding the period from January to March 2012 from the sample, as an additional robustness check.

In any case, our identification strategy does not allow distinguishing the effect of each provision implemented by the reform, only the overall effect. There were however two provisions contained in the reform that arguably have a differential effect for firms above and below a specific firm size threshold: i) the *Contrato de Apoyo a Emprendedores*, available for firms with no more than 50 workers and ii) the suppression of back-pay in the case of unfair dismissal and the clarification of fair economic dismissal, which eliminated the incentive for employers to take the route of *"despido exprés"* (the most common route previously). Although these provisions apply in principle to all firms, the reform has increased the probability of firms with fewer than 25 employees receiving the severance-pay subsidy, for which they are eligible only in the case of fair dismissals.

4. Results

As already explained in the previous section, we are using in this study data coming from the "Muestra Continua de Vidas Laborales" (MCVL). Each wave of this dataset contains a random sample of 4% of all the individuals who had contributed to the social security system (either by working or being on an unemployment scheme) or had received a contributory benefit (such as permanent disability, old-age, etc.) during at least one day in the year the sample is selected. Hence, the sample is not including those individuals without any contact to Social Security in such a year. This may create some risks of sample selection,

especially among women, immigrants or young workers. Hence, in order to minimize the potential selection effects, we combine the database for seven waves, from 2006 to 2014. That is, we include all individuals that had a relationship of at least one day during this nine-year period with the Social Security administration. For them, we have their complete labour market history observed in the data.

We present in Table 1 the descriptive statistics of the samples used to study respectively transitions from unemployment to employment and transitions from employment to out-of-employment. The sample of unemployed individuals has an average unemployment duration of 11.8 months, has been unemployed 4,9 times and around 31% receive unemployment benefits. Most of them are young (41%), with a low level of qualification (46%) and have worked in the services sector. The sample of employed individuals is mostly between 31 to 44 years old (53%), has a high level of qualification (37%) and works in the services sector. The employment duration in the same job is on average 3,1 years, mostly on permanent contracts (54%). Of those on temporary contracts, some specific durations are more recurrent (1, 6, 12, 24 and 36 months). Almost half of the individuals are employed in small or medium enterprises (under 50 employees), in particular in very small ones (25% of the sample work in firms that employ between 1 and 9 employees).

Table 1
DESCRIPTIVE STATISTICS

Transitions out of Unemployment					Transitions out of Employment				
	Mean	Std. Dev.	Min	Max		Mean	Std. Dev.	Min	Max
Out of Unemployment (=1 if yes)	0,09	0,29	0	1	Out of Employment (=1 if yes)	0,08	0,35	0,0	3,0
Unempl. Duration (months)	11,83	9,97	1,00	36,00	Empl. Duration (years)	3,08	2,37	1,0	10,0
With unempl. Benefits (=1 if yes)	0,31	0,46	0,00	1,00	Permanent contract (=1 if yes)	0,54	0,50	0,0	1,0
					Contract duration dummy:				
					1 month	0,09	0,28	0,0	1,0
					6 month	0,04	0,21	0,0	1,0
					12 month	0,03	0,16	0,0	1,0
					24 month	0,02	0,12	0,0	1,0
					36 month	0,01	0,10	0,0	1,0
Age 16-30	0,41	0,49	0,00	1,00	Age 16-30	0,29	0,45	0,0	1,0
Age 31-44	0,37	0,48	0,00	1,00	Age 31-44	0,53	0,50	0,0	1,0
Age 45-64	0,22	0,41	0,00	1,00	Age 45-64	0,19	0,39	0,0	1,0
High Qualification	0,20	0,40	0,00	1,00	High Qualification	0,37	0,48	0,0	1,0
Medium Qualification	0,34	0,47	0,00	1,00	Medium Qualification	0,33	0,47	0,0	1,0

(*Continued*)

Transitions out of Unemployment					Transitions out of Employment				
	Mean	Std. Dev.	Min	Max		Mean	Std. Dev.	Min	Max
Low Qualification	0,46	0,50	0,00	1,00	Low Qualification	0,30	0,46	0,0	1,0
Time trend (=0 in Feb. 2012)	-15,58	28,88	-74,00	33,00	Time trend (=0 in Feb. 2012)	-18,76	28,92	-74,0	33,0
Agriculture	0,02	0,15	0,00	1,00	Agriculture	0,02	0,12	0,0	1,0
Industry	0,09	0,29	0,00	1,00	Industry	0,12	0,32	0,0	1,0
Construction	0,15	0,36	0,00	1,00	Construction	0,11	0,31	0,0	1,0
Non-market services	0,12	0,33	0,00	1,00	Non-market services	0,16	0,37	0,0	1,0
Retail sales	0,14	0,35	0,00	1,00	Retail sales	0,16	0,37	0,0	1,0
Hotel	0,13	0,34	0,00	1,00	Hotel	0,10	0,30	0,0	1,0
Other Services	0,34	0,47	0,00	1,00	Other Services	0,33	0,47	0,0	1,0
Immigrant	0,22	0,41	0,00	1,00	Immigrant	0,16	0,37	0,0	1,0
Male	0,52	0,50	0,00	1,00	Male	0,52	0,50	0,0	1,0
No. Of Unempl. Spells	4,88	4,55	0,00	97,00	No. Of Unempl. Spells	4,30	4,44	0,0	97,0
% of time employed	0,68	0,28	0,00	1,00	% of time employed	0,84	0,16	0,0	1,0
DlogE	-0,02	0,04	-0,16	0,14	DlogE	-0,02	0,04	-0,2	0,1
FEDEA Index	-0,68	0,91	-3,02	0,61	FEDEA Index	-0,66	0,92	-3,0	0,6
(=1 after feb/2012)	0,34	0,47	0,00	1,00	(=1 after feb/2012)	0,31	0,46	0,0	1,0
					Firm Size:				
					1 to 9	0,25	0,44	0,0	1,0
					10 to 24	0,13	0,34	0,0	1,0
					25 to 49	0,10	0,30	0,0	1,0
					50 to 99	0,08	0,28	0,0	1,0
					100 to 249	0,09	0,29	0,0	1,0
					250 or more	0,34	0,47	0,0	1,0

Monthly data.
Number of Observations: 3.099.026,00 - Number of Observations: 3.713.658
Note: The dataset includes as well 17 regional dummies and 12 calendar dummies.
Source: "Muestra Continua de Vidas Laborales" (MCVL).

Before presenting our results, we present graphical evidence in support of the application of our identification strategy in Figures 1 and 2. According to Lee and Lemieux (2010), regression discontinuity needs that all "baseline characteristics", that is, all those variables determined prior to the realization of the assignment variable, should have the same distribution just above and just below the cut off. This is basically what happens as can be seen in these two figures where the main individual characteristics affecting the exit from unemployment to employment and the one from employment to unemployment are shown to have no jumps at the moment the 2012 reform was implemented.
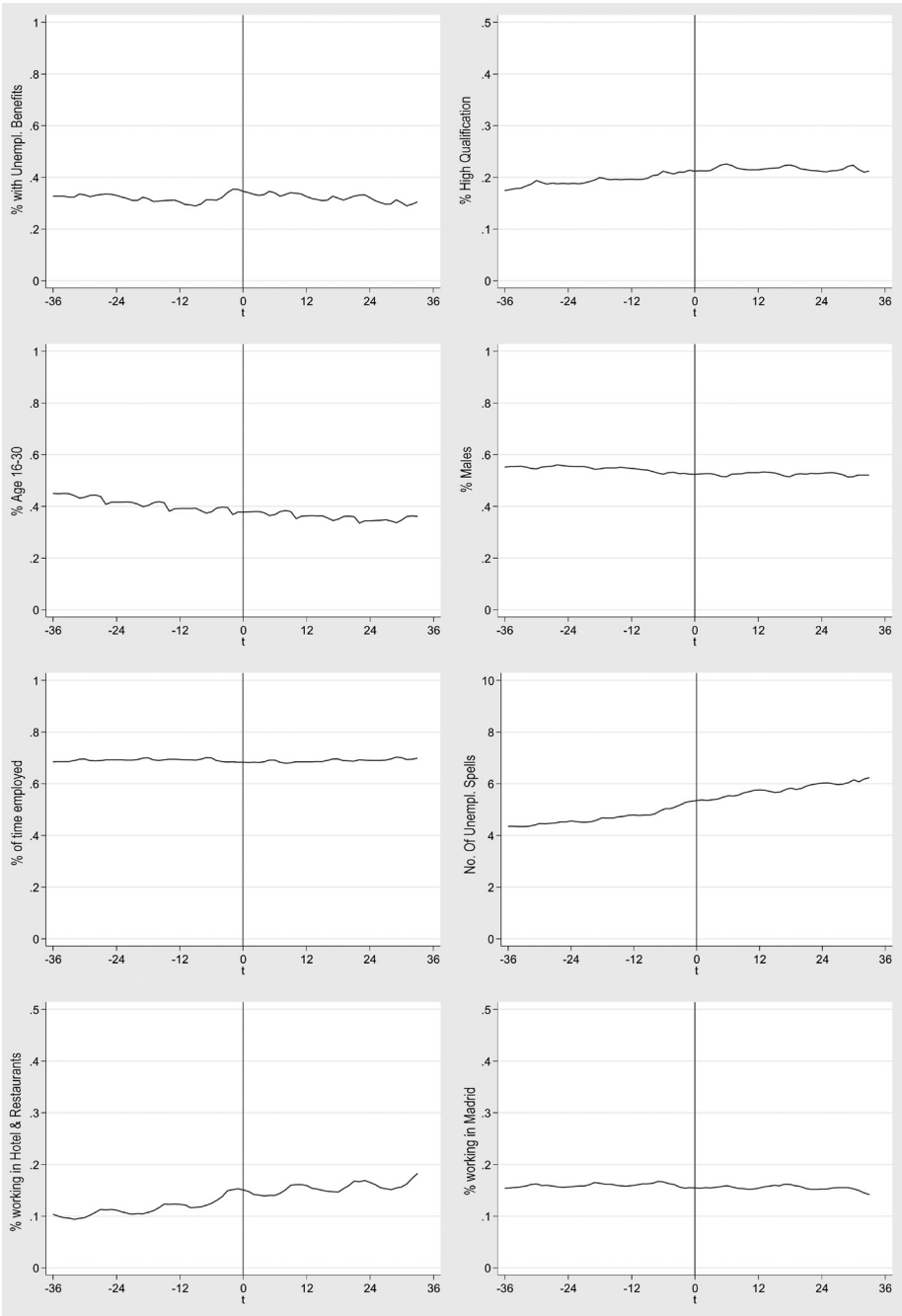
Figure 1: Distribution of baseline characteristics across time:
Transitions out of Unemployment
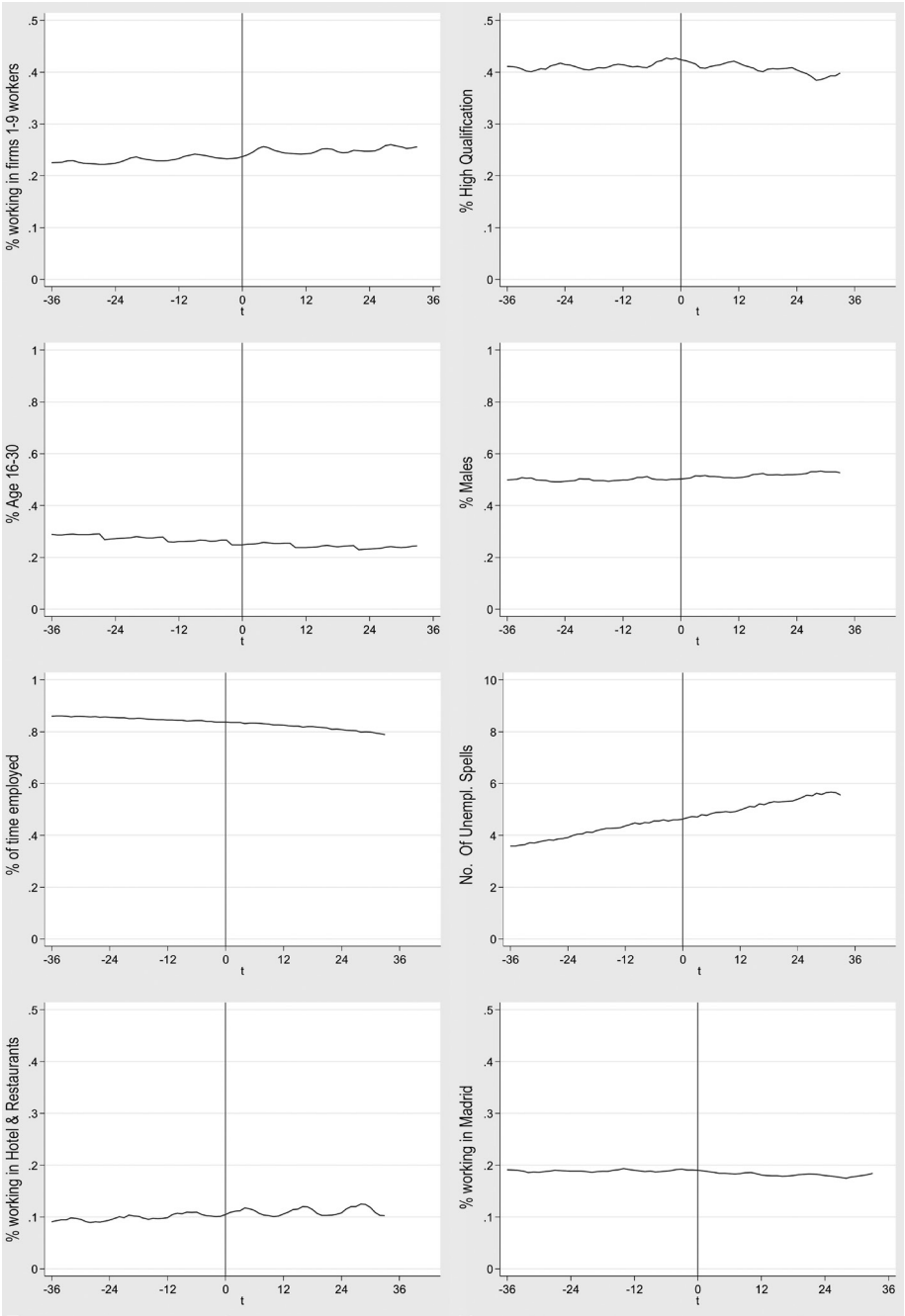
**Figure 2: Distribution of baseline characteristics across time:
Transitions out of Employment**

4.1. Exit from unemployment into employment

In this section, we will present several sets of results. First, we present the results of estimating the exit rate from unemployment to any type of job and thereafter distinguishing between exits to temporary employment and exits to permanent employment. Furthermore, supplementary results will be presented from models that allow differentiating between the exit to temporary or permanent work based on the size of the company that hires the unemployed person. For this purpose, we shall evaluate the 25 and 50 as critical firm sizes because these values are the thresholds that determine access to subsidies from FOGASA (25 employees) and that allow the possibility of signing the new *contrato de Apoyo a Emprendedores* (50 employees).

Table 2 shows the values of the estimated coefficients for the first two models. The specification of the unemployment exit rate includes, as explained in Section 3, a polynomic specification for the duration dependence, as is commonly done in these models (see García-Perez and Muñoz Bullón, 2011, for example). Specifically, the dependence of this exit rate with respect to unemployment duration has been modelled using a third-degree polynomial in the logarithm of unemployment duration. Similarly, the time trend of the data in the sample has been modelled by means of a second-degree polynomial with different coefficients for the pre- and post-reform period, *i.e.*, for before and after February 2012. This specification provides more flexibility to the model because it allows for a possible discontinuity in the evolution of the dependent variable at the moment of the reform's approval. Finally, in addition to the binary variables for each month in which the exit from unemployment occurs, the autonomous community of residence, and the economic sector from which the unemployed worker originates, the main regressors included in the estimated models are gender, nationality, age (those under the age of 30 are in the constant term), qualification (low-skilled people are in the constant term), whether unemployment benefits were received, the number of prior unemployment spells, the percentage of time the individual has been employed during his/her working life, the year-on-year variation of the total number of affiliated contributors to Social Security (acting as an indicator of the cyclical condition of the job market at a provincial level), and the rate of change of the FEDEA index to capture the cycle's status at the national level.

As is usual in this type of model (see Meyer, 1990, for example), the duration of the unemployment period significantly reduces the probability of joining the workforce in a non-linear manner. Conversely, unemployment benefits strongly reduce the probability of re-employment, although their effect diminishes with respect to the duration of the period of unemployment (see García-Pérez and Rebollo, 2015)[13]. Age also has a significant effect on the probability of exiting unemployment, particularly for young people; they have a smaller probability of exiting to a permanent job than do their more senior counterparts. The degree of qualification also affects the probability of exiting to work under a temporary or a permanent contract; those who are more qualified have the highest chance of exiting to permanent employment, whereas those with the lowest level of qualification exit more frequently to a temporary position. Being an immigrant is another detrimental factor to joining the work-

force, particularly with respect to being hired on a permanent contract. Men exit unemployment to a temporary position sooner than women do, the latter being more likely to join the workforce in a permanent position.

Table 2
THE EFFECT OF THE REFORM ON TRANSITIONS OUT OF UNEMPLOYMENT INTO TEMPORARY EMPLOYMENT AND INTO PERMANENT EMPLOYMENT

Exit to:	To any Employment	To Temporary Empl.	To Permanent Empl.
ln(unempl. duration)	-1.318***	-1.517***	-0,0538
	-0,0706	-0,0547	-0,182
ln(unempl. duration)^2	0.551***	0.699***	-0.380**
	-0,0537	-0,0405	-0,148
ln(unempl. duration)^3	-0.127***	-0.154***	0,0405
	-0,0108	-0,00836	-0,0298
With unempl. Benefits	-1.099***	-1.107***	-1.057***
	-0,0354	-0,0318	-0,0792
* ln (unempl. duration)	0.151***	0.167***	0,032
	-0,0181	-0,0173	-0,0329
Age 31-44	0.0507***	0,0176	0.284***
	-0,0147	-0,0137	-0,0303
Age 45-64	-0.100***	-0.231***	0.561***
	-0,0261	-0,0177	-0,0554
ln (unempl. duration) * Age 31-44	-0.138***	-0.138***	-0.122***
	-0,011	-0,0108	-0,0188
ln (unempl. duration) * Age 45-64	-0.196***	-0.180***	-0.254***
	-0,0137	-0,0119	-0,0281
High Qualification	-0.0522**	-0.0879***	0.106**
	-0,0208	-0,023	-0,0503
Medium Qualification	0.0483***	0.0718***	-0.0954**
	-0,0141	-0,0116	-0,0445
ln (unempl. duration) * High qualif.	0,0124	0,00131	0.110***
	-0,0092	-0,00982	-0,0217
ln (unempl. duration) * Low qualif.	-0,00461	-0.0142**	0.0766***
	-0,00643	-0,00594	-0,0192
t	-0.00747***	-0.00526***	-0.0238***
	-0,00167	-0,00172	-0,00366
t^2	-1,82E-05	1,25E-05	-0.000243***
	-2,33E-05	-2,42E-05	-5,06E-05

(Continued)

Exit to:	To any Employment	To Temporary Empl.	To Permanent Empl.
t $I_{t>R}$	0.0174***	0.0183***	0,0123
	-0,00354	-0,00353	-0,00906
t^2 $I_{t>R}$	-0.000546***	-0.000647***	0,000155
	-0,000102	-0,000104	-0,00026
Immigrant	-0.216***	-0.185***	-0.388***
	-0,0394	-0,0399	-0,0469
Male	0,0202	0.0640***	-0.284***
	-0,0154	-0,0118	-0,0456
No. Of Unempl. Spells	0.0597***	0.0594***	0.0667***
	-0,0014	-0,00136	-0,00244
% of time employed	1.165***	0.982***	2.766***
	-0,0685	-0,0633	-0,114
ΔlogE	1.605***	1.571***	1,501
	-0,442	-0,434	-0,95
ln (unempl. duration) * ΔlogE	0,31	0,261	0.912**
	-0,25	-0,241	-0,463
FEDEA Index	0.0882***	0.0867***	0.101***
	-0,0169	-0,0169	-0,0293
$I_{t>R}$ (=1 after feb/2012)	0.0882**	0,0411	0.414***
	-0,0345	-0,0365	-0,0736
Constant Term	-2.105***	-2.085***	-5.735***
	-0,0613	-0,0574	-0,114

Notes: Number of Observations: 2,453,446. Robust Standard Error in Parentesis.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Source: "Muestra Continua de Vidas Laborales" (MCVL).

The business cycle has the expected effects on the probability of exiting from unemployment; the FEDEA index of economic activity has a significantly positive effect on the likelihood of exiting unemployment, and higher employment growth at the provincial level has a highly positive effect on the exit rate. Finally, the second-degree polynomial trends also appear to be quite important and show a different evolution of the unemployment exit rate before and after the reform, a finding that could indicate that the trend of the analysed series is somewhat more positive as of February 2012 independently of how the market has evolved since that date. Finally, the impact of the 2012 labour reform on the transition from unemployment to any type of employment, without making a distinction between exits to temporary and permanent employment, is significantly positive, as shown in the final part of Table 2. The estimated coefficient of the *dummy* variable that covers the reform is +0.0882, which implies that the unemployment exit rate increased by 9.2% due to the reform, that is, the rate rises from 0.095 to 0.104 on average.

If we distinguish between exit from unemployment to a temporary contract and to a permanent contract, Table 2 shows that the estimated effect of the reform is greater and significant only in the case of exiting to permanent employment (the estimated coefficient is 0.414 compared with 0.041 for exiting to temporary employment). In other words, according to these results, the labour reform lifted the possibility of exiting unemployment to a permanent job by 51.3% but had an insignificant effect on the exit rate to temporary employment. The average unemployment exit rate to temporary employment in our sample was 8.15% (11.8% for the first twelve months in unemployment) and, according to our results, has not significantly varied due to the reform. The average unemployment exit rate to permanent employment was 1.2% (1.7% for the first twelve months in unemployment) and has shifted to an average of 1.75% due to the reform (2.6% on average for the first twelve months of unemployment).

As Table 2 shows, the estimated behaviour of exiting unemployment to general employment is very different for the period before and after the introduction of the labour reform, i.e., February 2012. We observe that although the general trend of this series is decreasing before 2012 (independently of the individual and aggregate characteristics considered), following the introduction of the labour reform, the series shows a positive and quadratic trend with a negative drift. Something similar occurs in the model when distinguishing between the types of contract in the new job, albeit in this case, the trend shifting with the introduction of the reform is that of the exit from unemployment to temporary employment, which develops a more positive trend compared with the period before the reform. However, with respect to the unemployment exit rate to permanent employment, no change is estimated in the trend of the additional series for the knock-on effect discussed earlier and which raises this exit rate by 51.3%.
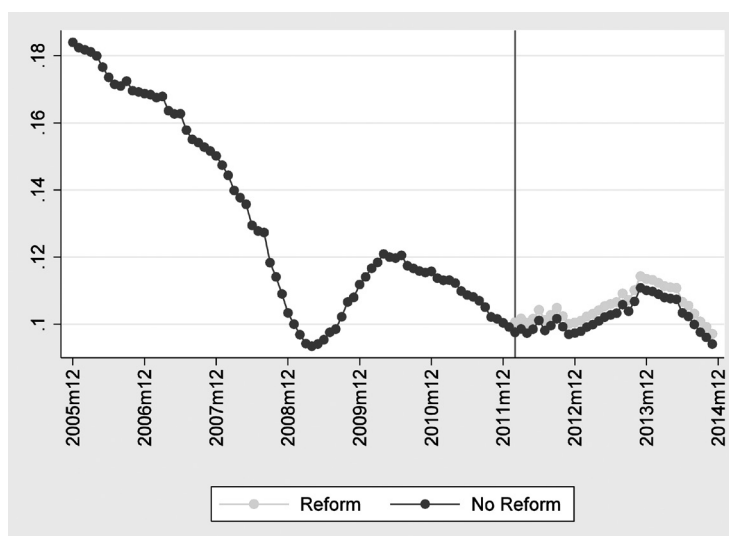

Figure 3: Predicted transition from unemployment to temporary employment

To fully assess the development of these series, the coefficients concerning the effect of the business cycle (the change in log employment at the provincial level and the FEDEA index of economic activity) must be considered jointly with the time trend coefficients and the reform coefficient. Therefore, Figures 3 and 4 show the projection over time for the predicted effect of the reform on the average transition from unemployment to temporary employment and the transition to permanent employment for unemployment durations equal to or lower than six months, respectively. In these figures, whose unique objective is to illustrate the estimated impact of the reform around the threshold, we can clearly ascertain that the impact of the reform is greater on the exit rate to permanent employment than that observed on the exit rate to temporary employment. In fact, the coefficient that tracks the reform's effect on the exit rate to temporary employment is not significantly different from zero. Using the values indicated above as reference values, our model predicts that, whereas prior to the reform, exiting to temporary employment was 7 times more probable than exiting to a permanent position, following February 2012, the aforementioned ratio was reduced to a probability approximately 4.6 times higher due to the measures included in the labour reform. Note, however, that exiting to permanent employment continues to be highly unlikely in the Spanish job market even after the approval of the measures included in the 2012 reform.
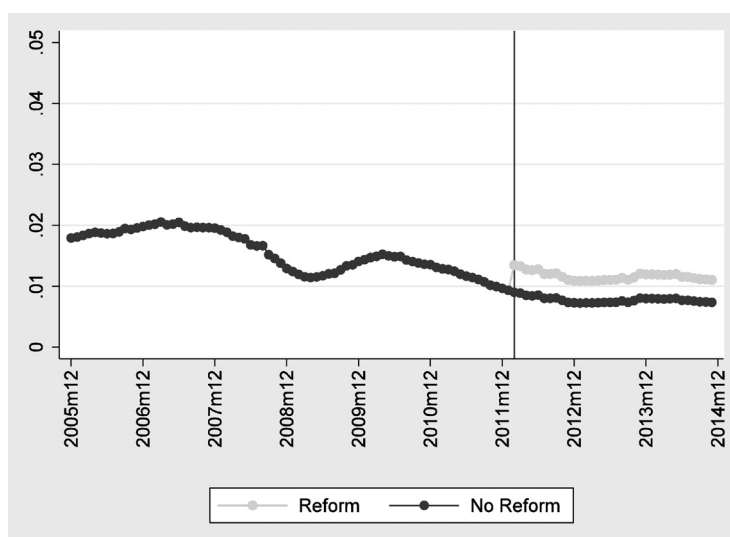
Figure 4: Predicted transition from unemployment to permanent employment

Compared with the results obtained in OECD (2014a), our results show the reform is having a greater effect on the exit rate to permanent employment (0.391 compared with the previously estimated coefficient equal to 0.256) and a similarly insignificant effect on the exit rate to temporary work. Apart from the differing sample period used in this analysis in comparison with that report (here until the end of 2014, compared with the end of 2012 in

OECD, 2014a), the main difference between our model and the estimation in that report is the different specifications for the trend of the series before and after the reform, which allow the possible causal effect of the policy to be better identified in our case.

In this type of model, which tries to capture the causal impact of a change in an economic policy by means of the discontinuity in the series affected by that change, the results can be quite dependent upon the particular specification of the trend before and after the moment in which the aforementioned discontinuity occurs. Therefore, we estimated the model under different specifications for the dummy capturing the effect of the reform and for the time trend in each specification. The results for all of these alternative specifications are shown in Table 3. This table also covers the impact of the reform on other alternative specifications when the number of destinations to which a worker can proceed upon exiting unemployment is increased. The estimated coefficients in the models already shown in Table 2 are covered in the first two panels of this table. The third panel covers an alternative model in which exit is allowed to either temporary or permanent work, drawing a distinction between companies with more or fewer than 50 employees. The objective here is to examine whether the limit imposed in the reform for the new *Contrato de Apoyo a Emprendedores,* only available to companies with fewer than 50 employees, has a differential effect in the unemployment exit rate. Finally, the model in the fourth panel of Table 3 allows for a competing risk model with six possible exits, in this case allowing a distinction to be drawn between exits to companies with fewer than 25 employees, between 25 and 50 employees, and more than 50 employees. The objective now is to determine whether the FOGASA benefits available until the end of 2013 acted as an additional incentive for companies with fewer than 25 employees.

The results of Table 3 reflect the high level of stability of the estimated coefficients for the impact of the reform, independently of the specification for the trend, both when a common trend is imposed before and after the reform and when differences are allowed between the sub-periods before and after February 2012. Although in some cases the model that does not distinguish between temporary and permanent workers estimates insignificant effects for the 2012 reform, the estimated effect on the exit from unemployment to a permanent position is always significant when a differential effect is allowed for an exit from unemployment to a temporary position and an exit to a permanent position.

Additionally, in the third panel of Table 3, we can verify that the effects of the 2012 reform are more relevant among companies with fewer than 50 employees. Focussing on our preferred specification, shown in Table 2, with a quadratic polynomial and a different effect for the two sub-periods pre- and post-reform, the estimated coefficient for exiting unemployment to temporary employment is not significant in either type of company. However, for the exit from unemployment to a permanent position, the estimated coefficient for companies with fewer than 50 employees is more than three times that of larger companies (0.609 compared with 0.183). These results might indicate that companies with fewer than 50 employees, which can access the subsidies and benefits associated with the new *Contrato de Apoyo a Emprendedores*, are the ones that are more encouraged to offer a permanent contract fol-

lowing the reform's approval. An additional exercise that supports this conclusion (and that consists of comparing the probability of exiting from unemployment to permanent employment near this 50-worker limit) indicates that for companies with between 40 and 50 employees, the impact of the reform is significantly positive (+0.392), whereas for very similar companies with between 51 and 60 employees, the coefficient is not significant[14].

Table 3
THE EFFECT OF THE REFORM ON TRANSITIONS FROM UNEMPLOYMENT
TO EMPLOYMENT

Exit from Unem to Employment		Common polynomial trend pre- and post-reform				Different polynomial trend pre- and post-reform			
		1st order	2nd order	3rd order	4th order	1st order	2nd order	3rd order	4th order
U to E.	All sample	0.155***	0.190***	0.187***	0.0535*	0.169***	0.0882**	0.0232	0.0384
U to Temp.	All sample	0.156***	0.171***	0.158***	0.0224	0.169***	0.0411	-0.0180	0.0113
U to Perm.		0.147***	0.314***	0.395***	0.268***	0.172***	0.414***	0.283***	0.219***
U to Temp.	Establish. <=50 empl.	0.218***	0.232***	0.198***	0.0493	0.252***	0.0807*	0.0210	0.0283
	Establish. >50 empl.	0.0852***	0.100**	0.112***	-0.0103	0.0683**	-0.00522	-0.0730*	-0.0177
U to Perm.	Establish. <=50 empl.	0.278***	0.416***	0.515***	0.447***	0.284***	0.609***	0.490***	0.493***
	Establish. >50 empl.	-0.00358	0.198***	0.266***	0.0690	0.0408	0.183*	-0.00269	-0.159
U to Temp.	Establish. <=25 empl.	0.229***	0.250***	0.210***	0.0456	0.271***	0.0853**	0.0112	0.0222
	Establish. 25<x<=50 empl.	0.153***	0.134***	0.133***	0.0659	0.138***	0.0482	0.0687	0.0639
	Establish. >50 empl.	0.0852***	0.100**	0.112***	-0.0103	0.0683**	-0.00524	-0.0729*	-0.0177
U to Perm.	Establish. <=25 empl.	0.277***	0.419***	0.530***	0.464***	0.281***	0.650***	0.469***	0.439***
	Establish. 25<x<=50 empl.	0.283***	0.401***	0.441***	0.364**	0.300***	0.407***	0.593***	0.736***
	Establish. >50 empl.	-0.00354	0.198***	0.266***	0.0691	0.0408	0.183*	-0.00248	-0.158

Notes: U: unemployment; C: any emplment contract; PC: permanent employment; TC: temporary employment.
***, **, *: significant at the 1%, 5% and 10% level, respectively.
Source: "Muestra Continua de Vidas Laborales" (MCVL).

Finally, we try to verify if the causal effect of the reform is different for different firms in term of size. We test this hypothesis by interacting the reform dummy with firm size. In this sense, the model shown in the final panel of Table 3 emphasizes that those companies with fewer than 25 employees are the ones that are hiring the most unemployed people to permanent contracts following the reform's introduction (+0.650 compared with +0.407 for companies with between 26 and 50 employees, and +0.183 for companies with more than 50 employees). This result is indicative that the incentives to sign permanent contracts for these companies with fewer than 25 employees (explained in Section 2) are working. In the event of dismissal, the compensation costs were practically the same as those of a temporary contract, because in that case, the FOGASA benefit was available (these incentives were avail-

able until the end of 2013). In fact, if we once again adjust the size margin even more to compare exits with companies that are very similar in size but slightly above or below this 25-worker limit, we obtain very illuminating results that show that this margin is important for exiting to permanent employment. In an additional exercise, available upon request, we reduce the focus and just compare companies of from 20 to 25 employees with companies of from 26 to 30. We use the same identification strategy by interacting the reform dummy with firm size within this subgroup of companies and we get that the estimated coefficient for exiting to permanent employment is +0.677, for 20-25 firms, compared to +0.393, for 26-30 firms. Furthermore, we get that this difference is only significant for the period in which the FOGASA benefits were available, i.e., until the end of 2013.

Table 4
THE EFFECT OF THE REFORM ON TRANSITIONS OUT OF UNEMPLOYMENT INTO TEMPORARY EMPLOYMENT AND INTO PERMANENT EMPLOYMENT, BY TYPE

		Women	Men	Young (<30y)	Old(>30y)
U to E.	All sample	0.112***	0.0716*	0.0874**	0.0942**
U to Temp.	All sample	0.0601	0.0295	0.0346	0.0532
U to Perm.		0.410***	0.440***	0.634***	0.314***
U to Temp.	Establish. <=50 empl.	0.0925**	0.0714	0.0944**	0.0729
	Establish. >50 empl.	0.0224	-0.0315	-0.0332	0.0276
U to Perm.	Establish. <=50 empl.	0.613***	0.590***	0.769***	0.520***
	Establish. >50 empl.	0.223*	0.170*	0.421***	0.0799
U to Temp.	Establish. <=25 empl.	0.127***	0.0586	0.0962**	0.0814*
	Establish. 25<x<=50 empl.	-0.0721	0.139**	0.0873	0.0235
	Establish. >50 empl.	0.0237	-0.0311	-0.0320	0.0280
U to Perm.	Establish. <=25 empl.	0.671***	0.623***	0.847***	0.551***
	Establish. 25<x<=50 empl.	0.364*	0.458**	0.427*	0.398**
	Establish. >50 empl.	0.223*	0.171*	0.424***	0.0797

Monthly data, coefficients of the competing-risk hazard models.
Different 2nd order polynomial trend pre- and post-reform.
Notes: U: unemployment; C: any emplyment contract; PC: permanent employment; TC: temporary employment.
***, **, *: significant at the 1%, 5% and 10% level, respectively.
Source: "Muestra Continua de Vidas Laborales" (MCVL).

As an additional exercise, we present in Table 4 the results of the same model in Table 2 but for different subgroups of the sample of estimation. This table shows, for example, that the impact of the reform is somewhat greater for men than for women, and likewise considerably greater for workers under 30 than for people over that age. The estimated impact of the reform is especially high on the exit rate from unemployment to permanent employment among young people; the estimated coefficient for these workers is 0.634 compared with 0.314 among the remaining workers. Calculating the estimated odds ratio for these cases shows that the exit to permanent employment among young people has grown by almost 88.5% compared with an

estimated growth of 36.9% for people over the age of 30. Because this monthly exit rate to permanent employment among young people is approximately 1.1% on average, our estimation implies that this rate might have risen to levels of approximately 2.07% due to the reform.

Table 5
THE EFFECT OF THE REFORM ON THE TRANSITION FROM SHORT-TERM AND LONG-TERM UNEMPLOYMENT

	Unemployment duration <= 12 months				
	All	**Females**	**Males**	**Young**	**Old(>30y)**
Exit into Employment					
- any contract	0.0758***	0.0859**	0.0740*	0.0632	0.0922**
Exit into Employment					
- Temporary contract	0.0299	0.0383	0.0302	0.0110	0.0538
- Permanent contract	0.391***	0.353***	0.456***	0.612***	0.296***
Exit into Employment					
- Temporary <25 empl.	0.0680*	0.0749*	0.0685	0.0788*	0.0655
- Temporary >50 empl.	-0.0146	0.00290	-0.0261	-0.0614	0.0388
- Permanent < 50 empl.	0.571***	0.555***	0.585***	0.762***	0.480***
- Permanent > 50 empl.	0.184*	0.188	0.235**	0.391***	0.101
	Unemployment duration > 12 months				
	All	**Females**	**Males**	**Young**	**Old(>30y)**
Exit to Employment					
- Any contract	0.0863*	0.220***	-0.0468	0.143***	0.0301
Exit to Employment					
- Temporary Contract	0.0273	0.135*	-0.0760	0.0903*	-0.0353
- Permanent Contract	0.556***	0.825***	0.212	0.660***	0.471***
Exit to Employment					
- Temp. <50 workers	0.0532	0.147	-0.0211	0.0789	0.0311
- Temp. >50 workers	-0.0158	0.102	-0.155*	0.0817	-0.119
- Perm. < 50 workers	0.779***	0.968***	0.545**	0.749***	0.793***
- Perm. > 50 workers	0.135	0.588**	-0.499**	0.508*	-0.187

Monthly data, coefficient of the reform dummy in each of the estimated models.
Different polynomial for the pre- and post-reform trend (2nd order).
Notes: U: unemployment; C: any emplment contract; PC: permanent employment; TC: temporary employment.
****, **, *: significant at the 1%, 5% and 10% level, respectively.*
Source: "Muestra Continua de Vidas Laborales" (MCVL).

A different exercise can be seen in Table 5, which shows the results when the model is estimated separately for short- and long-term unemployed workers (that is, twelve months or less and more than twelve months unemployed). Although for the whole population at an

aggregate level, few differences are observed between the reform's impact on short-term and long-term unemployed periods (the estimated coefficients for the reform's impact are similar in magnitude, but differences emerge in their significance levels), the effects tend to be more significant for short-term periods of unemployment. When we also make distinctions according to the gender or age of the unemployed person, interesting differences emerge. Thus, it appears that the reform has had a more positive effect on long-term unemployed women than for men in the same situation; the exit to permanent employment is greater for women (0.825) than for men (0.212). Young people, however, continue to show a greater positive effect of the reform, both for those who are short-term unemployed (0.612) and for those who are unemployed for more than twelve months (0.660).

Table 6
THE EFFECT OF THE REFORM ON THE TRANSITION OUT OF UNEMPLOYMENT: DIFFERENT POST-REFORM SAMPLES

		Post-reform sample period:		
		2012	**2012-2013**	**2012-2014**
U to E	All sample	0.142***	0.0998***	0.0882**
U to Temp.	All sample	0.103***	0.0508	0.0411
U to Perm.		0.397***	0.439***	0.414***
U to Temp.	Establish. <=50 worlers	0.145***	0.107***	0.0795*
	Establish. >50 wokers	0.0428	-0.0194	-0.00590
U to Perm.	Establish. <=50 workers	0.604***	0.651***	0.603***
	Establish. >50 workers	0.0925	0.144	0.183*
U to Temp.	Establish. <=25 workers	0.137***	0.110***	0.0839*
	Establish. 25-50 workers	0.170***	0.0841	0.0477
	Establish. >50 workers	0.0430	-0.0194	-0.00594
U to Perm.	Establish. <=25 workers	0.619***	0.674***	0.644***
	Establish. 25-50 workers	0.527***	0.549***	0.404***
	Establish. >50 workers	0.0926	0.144	0.183*

Monthly data, Coefficient for the reform dummy in each of the estimated models.
Different Polynomial for the pre and post-reform time trend (2nd order).
Notes: U: unemployment; C: any emplyment contract; PC: permanent employment; TC: temporary employment.
***, **, *: significant at the 1%, 5% and 10% level, respectively.
Source: "Muestra Continua de Vidas Laborales" (MCVL).

From results shown in Table 6, we can conclude that the impact of the reform was not immediately felt; the estimated coefficient on the exit from unemployment to permanent employment using only data from a year after the reform is somewhat smaller (0.397) than when using data from up to two (0.439) or three (0.414) years following the reform. In any case, the differences are only slightly significant. The first column of this table also allows us to compare our results with those obtained in OECD (2014a). Only data from 2012 were used in this report, and the reform's effect on the transition to permanent employment was posi-

tively significant, with an estimated coefficient on this transition of +0.256. Comparing with the first column of Table 5 shows that with the same data, our estimated coefficient is somewhat higher (+0.397). This difference must arise from the changes to the database which has been in our estimation and which, as was noted above, consisted of the unification of consecutive employment spells within the same company with unemployment interruptions of less than fifteen days and the non-consideration of explanatory variables with possible endogeneity problems. Our results are along lines similar to those obtained in OECD (2014a), and they contain, in our view, a higher degree of reliability due to the larger estimation sample considered and due to the robustness tests performed. Finally, the result we obtain when using only the first 10 months after the approval of the reform can also be considered a closer examination of the discontinuity generated by the reform. By focussing only in that period, we obtain almost the same result as when using the complete estimation period, which helps us to conclude that the model is correctly identifying the causal effect of the reform by means of the discontinuity design approach we use.

For all of this analysis to be consistent, it is important that the indicator variable designed to measure the change introduced by the reform in February 2012 actually captures the impact of the labour market reform but excludes other developments that might have occurred some months before. Table 7 covers the results of different estimations with placebo effects that try to 'anticipate' the date of the change in the series when analysing November, August, May, and February in 2011 and November and August in 2010. As can be verified in this table, only when we anticipate the dates a few months before the real date is the effect on unemployment exit somewhat significant. However, it is smaller in absolute value that that found when we consider the true change that occurred in February 2012. If we anticipate the reform's effect by at least twelve months, the effect is then never significant; conversely, and if the effect is significant, it appears with the opposite sign to that found in our assessment exercise. From this analysis, we can conclude with a high degree of certainty that the discontinuity effect of February 2012 is the only change that identifies the true effect of the reform.

One important caveat that can arise when analysing transition probabilities is the presence of unobserved heterogeneity (see, for example, Van den Berg, 2001). If this heterogeneity is not considered when estimating the exit from unemployment to employment, some of the effects estimated might be biased, particularly the effect of unemployment duration, which might be negatively biased when unobserved heterogeneity is not controlled for. Table 8 presents the results for the estimation of the first model in Table 2 comparing the main coefficients in this model when unobserved heterogeneity is (and is not) controlled for. This heterogeneity is introduced in our model by assuming it follows a discrete distribution with two mass points (see Heckman and Singer, 1984). Hence, apart from the rest of coefficients in the hazard rate, we must estimate the two mass points and the probability of being at one of these points (the complementary one provides the value for this heterogeneity component taking the value in the second mass point)[15]. As this table shows, the impact of the reform when unobserved heterogeneity is considered is essentially similar under both specifications. Furthermore, the effect of unemployment duration and that of the pre and post-reform trend are all quite similar under both specifications. Hence, we conclude that the effect of unob-

served heterogeneity, if present in the data, is not changing much of the analysis concerning the exit from unemployment.

Table 7
PLACEBO TESTS FOR THE EXIT FROM UNEMPLOYMENT TO EMPLOYMENT

		Reform		Placebo tests				
		feb-12	nov-11	ago-11	may-11	feb-11	nov-10	ago-10
U to E	All sample	0.0882**	0.0435	0.0194	0.0449	0.00983	0.00382	-0.0134
U to Temp.	All sample	0.0411	0.00972	-0.0127	0.0301	0.0123	0.0113	-0.00682
U to Perm.		0.414***	0.284***	0.251***	0.156**	0.00138	-0.0456	-0.0469
U to Temp.	Establish. <=50 worlers	0.0795*	0.0449	0.0324	0.0713*	0.0501	0.0324	-0.00599
	Establish. >50 wokers	-0.00590	-0.0289	-0.0613*	-0.0140	-0.0278	-0.00815	-0.00438
U to Perm.	Establish. <=50 workers	0.603***	0.447***	0.291***	0.150*	0.0161	-0.0295	-0.132*
	Establish. >50 workers	0.183*	0.106	0.198**	0.157*	-0.000761	-0.0383	0.0495
U to Temp.	Establish. <=25 workers	0.0839*	0.0500	0.0320	0.0786*	0.0665*	0.0479	0.0104
	Establish. 25-50 workers	0.0477	0.0130	0.0324	0.0322	-0.0340	-0.0444	-0.0862**
	Establish. >50 workers	-0.00594	-0.0290	-0.0613*	-0.0140	-0.0279	-0.00828	-0.00448
U to Perm.	Establish. <=25 workers	0.644***	0.541***	0.318***	0.150*	0.0532	0.00635	-0.118*
	Establish. 25-50 workers	0.404***	-0.000965	0.161	0.147	-0.156	-0.193	-0.182
	Establish. >50 workers	0.183*	0.105	0.198**	0.157*	-0.00108	-0.0386	0.0493

Monthly data, Coefficient for the reform dummy in each of the estimated models.
Different Polynomial for the pre and post-reform time trend (2nd order).
Notas: U: desempleo; E: cualquier empleo; CI: empleo con contrato indefinido; CT: empleo con contrato temporal.
****, **, *: coef. significativo al 1%, 5% and 10% respectivamente.*
Source: "Muestra Continua de Vidas Laborales" (MCL).

As a final robustness check, we have replicated the regressions on transitions out of unemployment using as controls for the economic cycle the economic activity at a national level, measured by the FEDEA index of economic activity and by the change in log employment at the provincial level, or only the FEDEA index. The results in table 9 show that the impact of the reform is very similar under any of the two sets of controls for the economic cycle.

4.2. Exit from employment into unemployment

The labour market reform could also have modified the dismissal behaviour of firms. As mentioned in Section 2, the reform changed not only dismissal rules but also the alternative

options available to firms to adjust their staff. Therefore, in addition to the transitions out of unemployment already shown, we will analyse the transitions out of employment into unemployment as defined in equation (2), including the transitions from a temporary contract into unemployment and from a permanent contract into unemployment. In addition, we will analyse whether the reform also had an impact on job-to-job transitions.

The main coefficients of the model, as specified in equation (2) for transitions from employment into unemployment, are shown in Table 10, in which the variable that measures the impact of the labour market reform is binary with value 1 from February 2012 onwards and value zero beforehand. This table shows the results for exits from any employment, from temporary employment and from permanent employment and includes two specifications, one with the impact of the reform captured only by the variable and an alternative in which this variable is interacted with firm size to test whether there exists a differential impact of the reform among different firm sizes.

As shown in Table 10, the reform does not appear to have a significant effect on the probability of exiting employment overall, either for any employment or for temporary or permanent employment. However, it does appear to have a significant and differential effect for small firms, both when an identical polynomial trend is used before and after the reform and when we allow for a different polynomial trend. The interaction between the reform coefficient and firm size shows that the reform reduced the probability of exiting employment more for smaller firms (with fewer than 50 employees), and in particular for the smallest ones (those with 1 to 9 employees). If we differentiate between exits from temporary and from permanent employment, we find that the reform appears to have modified exits from temporary employment only. Figure 3 shows the predicted impact of the reform over the transitions from temporary employment (in the first 6 months) to unemployment for the average values of all variables (except for the polynomial trend and the economic cycle variables). In contrast, the probability of exiting permanent employment does not appear to be affected significantly by the reform. The reform, however, changed dismissal rules and reduced dismissal costs, which could facilitate dismissals, but also made available alternative options for firms to adjust their staff (such as modifying the number of hours, working conditions or wage conditions). Our results could be indicative that both effects compensated for each other in the case of permanent employment.

The rest of the regression coefficients show effects similar to those found previously in the literature for the probability of dismissal in Spain (see for example Garcia-Perez and Muñoz-Bullón, 2011). The probability of dismissal is much lower for those individuals with permanent contracts and less dependent upon contract duration than for those in temporary employment. The duration of employment affects the probability of dismissal non-linearly, and the probability increases at specific lengths of the contract, particularly for temporary contracts (at one, 6, 12, 24 and 36 months), as seen in Guell and Petrongolo (2007). Age also affects the probability of leaving employment; younger individuals are less likely to exit to unemployment than are their older counterparts. Qualification has a protective effect on the probability of leaving employment; those in more-skilled positions are less likely to move
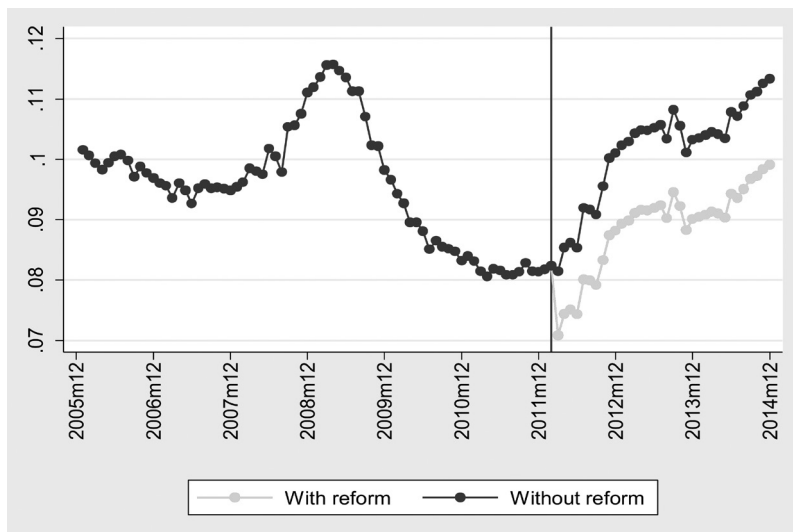
Figure 5: Predicted transition from temporary employment to unemployment for small firms –i.e. 1 to 9 employees– for durations of 6 months or less

into unemployment. Being an immigrant increases the probability of leaving employment, particularly from a permanent job. Male individuals are less likely to leave employment than are women. The previous individual employment and unemployment history have an effect on the probability of exiting employment; the greater the percentage of time in his labour market career the individual has been employed, the less likely he is to leave employment. Additionally, the more unemployment spells the individual has had, the more likely he is to exit to unemployment again. The controls for the economic cycle try to isolate the impact of the reform from that of the economic cycle; the polynomial trends of second order are significant and are allowed to differ before and after the reform. The economic cycle is measured by the economic activity at a national level, measured by the FEDEA index of economic activity and by the change in log employment at the provincial level. When estimated jointly, the FEDEA index does not have a significant effect, and the effect of the change in log employment is quite significant and negative, which means that firing is far more likely when employment is decreasing.

Table 11 shows the results of the impact of the reform on transitions from employment into unemployment by firm size using the same or different polynomial trends before and after the reform. The impact of the reform for specific firm sizes is robust to changes in the polynomial trend specification; the coefficients are very similar in both specifications (and in alternative ones not shown here).

To account for the potential endogeneity of the log employment at the provincial level, we have also estimated the transitions from employment into unemployment with and with-

out this variable as a robustness check. Table 12 shows the results using as controls for the economic cycle both the economic activity at a national level, measured by the FEDEA index of economic activity and by the change in log employment at the provincial level, or by only the FEDEA index. The impact of the reform is similar using any of the two sets of regressors as controls for the cycle (for the regressions shown here and other estimations not shown here). However, the FEDEA index has a significant effect when it is the only control for the economic cycle.

We have also estimated the effects of the reform for particular groups (women, men, young and older workers) and the results of competing risk models in which in addition to the risk of dismissal there is possibility of moving from job to job without going into unemployment. Table 13 shows that the reform reduced the probability of a transition from temporary employment into unemployment for small firms (with fewer than 50 employees); the smaller the firm, the more sizeable the effect. However, the reform does not appear to have modified (as we discussed previously) the probability of a transition from permanent employment into unemployment. Between different types of individuals, women and younger individuals are the ones more affected by the reform, whereas men and older individuals appear to be less affected.

When also considering the possibility of moving from job to job, the reform had a positive and significant impact on the probability of moving between jobs but only for those on temporary contracts (see results in table 14). This feature of the reform is positive because more mobility between contracts adds dynamism into the labour market. In this case, the impact on the probability of moving between jobs is not dependent on the size of the firm in which the individual was working (as was true for exits into unemployment). The impact of the reform is stronger for women on temporary employment than for men and for older individuals than for young (table 15). At the same time, those affected have a reduced probability of exiting temporary employment into unemployment and an increased probability of moving into another job. The effect on job-to-job transitions complements the previous effects of a comprehensive labour market reform that added dynamism, albeit only partially, to the Spanish labour market. To explore this issue a bit further, we have also estimated a model in which the job-to-job option is split into two additional options: exit to a new job under a temporary contract and exit to a new job under a permanent contract. The results for this model are shown in Table 16. We find that the job-to-job transitions that have increased the most after the 2012 reform are those to a new permanent contract. This finding is very interesting because, through this channel, the reform is also helping to reduce duality because those employed in a temporary contract have greater probabilities of direct transition to a permanent contract. Again, this effect is the largest for small firms, particularly for those with between 10 and 49 workers. The monthly job-to-job transition to a permanent position for temporary workers in these firms increases, on average, from 0.3 to 0.4% due to the reform[16].

Finally, as in the case of the exit from unemployment, we have also estimated the models for the exit from employment by controlling for the potential presence of unobserved heterogeneity in the data. As Table 17 shows, our main results address the impact of the re-

form over the exit from employment both when we consider all types of jobs and when we distinguish between the temporary and permanent workers. Again, and as is usual in the literature, the duration dependence of these hazard rates are somewhat less negative, but the effect of the reform on the exit from small firms is negative, particularly among temporary workers.

5. Conclusions

The 2012 labour market reform in Spain appears to have been a significant step in the direction of addressing and solving some of its main structural problems. As a result, the Spanish labour market has already shown signs of increased dynamism and lower dualism. The reform focussed primarily on collective bargaining and on dismissal regulations. This paper provides an analysis of the short- to medium-term effects of the reform on labour market performance. The results confirm that, as suggested previously (e.g., OECD, 2014, Izquierdo *et al*. 2013, Ministerio de Empleo y Seguridad Social, 2013, BBVA, 2013), the reform has had an effect on hiring, particularly on permanent contracts, which is most likely the outcome of the relaxation of dismissal regulations. Consistently, the reform appears to have also reduced the duration of unemployment spells due essentially to faster transitions towards a permanent contract. In addition, there are signs of a decrease in the segmentation of the labour market insofar as transitions to permanent jobs have increased in particular for workers entering unemployment after a temporary contract. Finally, there is also evidence of a reduction in separations, particularly for temporary workers, possibly resulting from the application of internal flexibility measures as an alternative to contract termination.

Using information on a sample of more than 200,000 workers employed and unemployed in Spain between 2003 and 2014 and applying an identification strategy based on a discontinuity design similar to that described in Hahn *et al*. (2001), we attempt to identify the time change in the probability of exiting both unemployment and employment that can be attributed to the effect of the Labour Market reform adopted in Spain in February 2012. We implement this policy evaluation exercise by estimating a discrete time duration model for the exit rate from unemployment to employment and from employment to unemployment.

Our results indicate that the 2012 Labour Reform appears to have increased the probability of exiting from unemployment to permanent employment, in both absolute and relative terms, against the alternative of exiting to a temporary contract. As a result, we can say that the reform has succeeded in reducing the degree of duality of the Spanish labour market. Indeed, our analysis confirms that, as initially noted in OECD (2014a), the reform has increased the probability of leaving unemployment to permanent employment. In particular, it increased from 1.7% to 2.6% on average in the first twelve months of unemployment. However, because the exit to temporary employment remains by far the most likely option, the overall effects of this increase on the stock of permanent workers remain not particularly relevant in the short term.

Finally, the effect of the reform on transitions from employment to unemployment appears to be quite different for temporary and permanent employment. On the one hand, the reform reduced job destruction rates of temporary workers, most likely because firms were making use of the new measures of internal flexibility available since 2012. We also find that the reform facilitated job-to-job transitions from temporary to permanent positions, which is another positive outcome of this reform, given that it is an additional and even more efficient source for reducing duality because no unemployment occurs during the transition. On the other hand, the reform did not lead to any significant effect on dismissal patterns for permanent workers (either positive or negative). We interpret this result as evidence that the reduction in dismissal costs for permanent workers, which could have increased their exit to unemployment, could have been compensated for by the availability of alternative flexibility measures also introduced by the 2012 reform (flexibility in hours, wages and other working conditions). Our results for permanent workers appear to indicate that these two types of measures could have counteracted each other, resulting in no effect on the exit from employment to unemployment for permanent workers.

Table 8
THE EFFECT OF THE REFORM ON THE TRANSITION FROM UNEMPLOYMENT TO EMPLOYMENT CONTROLLING FOR UNOBSERVED HETEROGENEITY

	No Unobserv. Heterog. Control	With Unobsev. Heterog. Control
lndurparo	-1,3180 ***	-1,2832***
lndurparo2	0,5514 ***	0,5968***
lndurparo3	-0,1271 ***	-0,1351***
T	-0,0075 ***	-0,0136***
t2	0,0000 **	-0,0001***
t $I_{t>R}$	0,0174***	0,0229***
t^2 $I_{t>R}$	-0,0005***	-0,0005***
$I_{t>R}$ (=1 after feb/2012)	0,0882***	0,1204***
Constant Term	-2,1055***	-2,7308***
Heterog. Inobserv component		
η_2		1,1517***
$Pr(\eta = \eta_2)$		0,6634***

Monthly data.
Notes: ***, **, *: significant coefficient at 1%, 5% y 10%, respectively.
Source: "Muestra Continua de Vidas Laborales" (MCVL).

Table 9
THE EFFECT OF THE REFORM ON TRANSITIONS OUT OF UNEMPLOYMENT, CONTROLLING FOR THE POTENTIAL ENDOGENEITY OF THE PROVINCIAL EMPLOYMENT CONTROL VARIABLE

	To any Employment		To Temporary Empl.		To Permanent Empl.	
$\Delta \log E$	1.605***		1.571***		1.501	
	(0.442)		(0.434)		(0.950)	
ln (empl. duration) * $\Delta \log E$	0.310		0.261		0.912**	
	(0.250)		(0.241)		(0.463)	
FEDEA Index	0.0882***	0.145***	0.0867***	0.141***	0.101***	0.173***
	(0.0169)	(0.0139)	(0.0169)	(0.0143)	(0.0293)	(0.0171)
$I_{t>R}$ (=1 after feb/2012)	0.0882**	0.0765**	0.0411	0.0289	0.414***	0.408***
	(0.0345)	(0.0379)	(0.0365)	(0.0393)	(0.0736)	(0.0772)

		Controls for the economic cycle included:	
		$\Delta \log E$ and Fedea Index	Fedea Index only
U to E	All sample	0.0882**	0.0765**
U to Temp.	All sample	0.0411	0.0289
U to Perm.		0.414***	0.408***
U to Temp.	Establish. <=50 worlers	0.0807*	0.0686
	Establish. >50 wokers	-0.00522	-0.0175
U to Perm.	Establish. <=50 workers	0.609***	0.599***
	Establish. >50 workers	0.183*	0.181*
U to Temp.	Establish. <=25 workers	0.0853**	0.0740
	Establish. 25-50 workers	0.0482	0.0324
	Establish. >50 workers	-0.00524	-0.0175
U to Perm.	Establish. <=25 workers	0.650***	0.640***
	Establish. 25-50 workers	0.407***	0.406***
	Establish. >50 workers	0.183*	0.181*

Monthly data, coefficients of the competing-risk hazard models
Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1*
Source: "Muestra Continua de Vidas Laborales" (MCVL).

Table 10
ESTIMATION RESULTS OF TRANSITIONS FROM EMPLOYMENT
INTO UNEMPLOYMENT

	Out of Employment		Permanent Contract		Temporary Contract	
ln(empl. duration)	0.508***	0.504***	2.650***	2.648***	0.654***	0.648***
	(0.183)	(0.183)	(0.537)	(0.537)	(0.185)	(0.185)
ln(empl. duration)^2	-0.323***	-0.320***	-0.929***	-0.928***	-0.449***	-0.445***
	(0.0930)	(0.0932)	(0.220)	(0.220)	(0.104)	(0.105)
ln(empl. duration)^3	0.0245	0.0239	0.0797***	0.0795***	0.0425**	0.0418**
	(0.0156)	(0.0157)	(0.0282)	(0.0282)	(0.0184)	(0.0184)
Empl. Duration 1 Month	0.854***	0.853***	2.293***	2.293***	0.868***	0.866***
	(0.0972)	(0.0973)	(0.337)	(0.337)	(0.0902)	(0.0902)
Empl. Duration 6 Months	0.614***	0.614***	0.197**	0.197**	0.699***	0.699***
	(0.0339)	(0.0339)	(0.0932)	(0.0930)	(0.0276)	(0.0276)
Empl. Duration 12 Months	1.032***	1.032***	-0.274***	-0.274***	1.394***	1.394***
	(0.0516)	(0.0516)	(0.0668)	(0.0667)	(0.0517)	(0.0517)
Empl. Duration 24 Months	0.372***	0.372***	-0.0847	-0.0850	0.666***	0.666***
	(0.0376)	(0.0376)	(0.0595)	(0.0595)	(0.0516)	(0.0517)
Empl. Duration 36 Months	0.492***	0.491***	0.224***	0.223***	0.735***	0.735***
	(0.0545)	(0.0545)	(0.0698)	(0.0695)	(0.0806)	(0.0807)
Age 31-44	0.108***	0.108***	0.180***	0.180***	0.125***	0.125***
	(0.0106)	(0.0106)	(0.0426)	(0.0427)	(0.0110)	(0.0110)
Age 45-64	0.250***	0.250***	0.356***	0.352***	0.277***	0.278***
	(0.0144)	(0.0144)	(0.0503)	(0.0505)	(0.0170)	(0.0170)
ln(empl. duration) * Age 31-44	0.00501	0.00480	0.0143	0.0143	-0.0141**	-0.0143**
	(0.00642)	(0.00642)	(0.0182)	(0.0182)	(0.00644)	(0.00644)
ln(empl. duration) * Age 45-64	0.00625	0.00593	0.0496***	0.0507***	-0.0392***	-0.0395***
	(0.00954)	(0.00953)	(0.0189)	(0.0190)	(0.00907)	(0.00908)
High Qualification	-0.397***	-0.397***	-0.592***	-0.587***	-0.328***	-0.329***
	(0.0189)	(0.0189)	(0.0593)	(0.0592)	(0.0228)	(0.0228)
Medium Qualification	-0.154***	-0.155***	-0.373***	-0.373***	-0.122***	-0.123***
	(0.0115)	(0.0115)	(0.0481)	(0.0482)	(0.0118)	(0.0118)
ln(empl. duration) * High Qualif.	-0.00903	-0.00986	0.0520***	0.0494**	-0.0307**	-0.0315**
	(0.0105)	(0.0105)	(0.0199)	(0.0202)	(0.0138)	(0.0138)
ln(empl. duration) * Medium Qualif.	0.0150*	0.0149*	0.0785***	0.0782***	0.00510	0.00493
	(0.00787)	(0.00788)	(0.0185)	(0.0185)	(0.00695)	(0.00696)
Permanent Contract	-1.341***	-1.344***				
	(0.0314)	(0.0312)				

(*Continued*)

	Out of Employment		Permanent Contract		Temporary Contract	
Immigrant	0.0993***	0.0968***	0.229***	0.228***	0.0648***	0.0623***
	(0.0141)	(0.0138)	(0.0311)	(0.0312)	(0.0142)	(0.0140)
Male	-0.0341**	-0.0351**	-0.123***	-0.123***	-0.00658	-0.00776
	(0.0140)	(0.0140)	(0.0318)	(0.0317)	(0.0115)	(0.0116)
No. Unempl. Spells	0.0545***	0.0544***	0.104***	0.104***	0.0441***	0.0440***
	(0.00122)	(0.00122)	(0.00188)	(0.00187)	(0.00127)	(0.00126)
% time employed	-1.067***	-1.065***	-0.877***	-0.880***	-1.077***	-1.075***
	(0.0599)	(0.0600)	(0.125)	(0.124)	(0.0563)	(0.0567)
t	-0.00809**	-0.00829**	-0.00605	-0.00607	-0.00660**	-0.00684**
	(0.00328)	(0.00326)	(0.00602)	(0.00602)	(0.00323)	(0.00321)
t^2	-0.000246**	-0.000252**	1.72e-05	1.53e-05	-0.000240**	-0.000246**
	(0.000125)	(0.000124)	(0.000242)	(0.000242)	(0.000120)	(0.000119)
t^3	-1.35e-06	-1.39e-06	2.36e-06	2.34e-06	-1.51e-06	-1.55e-06
	(1.31e-06)	(1.30e-06)	(2.76e-06)	(2.76e-06)	(1.22e-06)	(1.22e-06)
t $I_{t>R}$	0.0212	0.0209	0.000361	0.000553	0.0239*	0.0236*
	(0.0133)	(0.0133)	(0.0172)	(0.0171)	(0.0128)	(0.0128)
t^2 $I_{t>R}$	-0.00258**	-0.00256**	-0.000628	-0.000653	-0.00286***	-0.00285***
	(0.00104)	(0.00104)	(0.00127)	(0.00126)	(0.00103)	(0.00102)
t^3	7.19e-05***	7.16e-05***	2.60e-05	2.66e-05	7.89e-05***	7.85e-05***
	(2.20e-05)	(2.20e-05)	(2.52e-05)	(2.50e-05)	(2.21e-05)	(2.20e-05)
$\Delta logE$	-2.205***	-2.183***	-0.547	-0.501	-2.692***	-2.674***
	(0.567)	(0.569)	(1.318)	(1.307)	(0.541)	(0.542)
ln (empl. duration) * $\Delta logE$	0.437	0.436	-0.709**	-0.709**	0.882***	0.880***
	(0.328)	(0.330)	(0.312)	(0.311)	(0.337)	(0.338)
FEDEA Index	-0.0214	-0.0221	-0.0235	-0.0253	-0.0148	-0.0153
	(0.0159)	(0.0159)	(0.0300)	(0.0299)	(0.0153)	(0.0153)
Firm Size 1 to 9	0.248***	0.319***	0.360***	0.456***	0.221***	0.285***
	(0.0260)	(0.0233)	(0.0749)	(0.0875)	(0.0246)	(0.0212)
Firm Size 10 to 24	0.178***	0.216***	0.315***	0.348***	0.144***	0.180***
	(0.0227)	(0.0231)	(0.0633)	(0.0805)	(0.0244)	(0.0233)
Firm Size 25 to 49	0.134***	0.169***	0.315***	0.345***	0.0915***	0.127***
	(0.0204)	(0.0218)	(0.0562)	(0.0730)	(0.0223)	(0.0227)
Firm Size 50 to 99	0.117***	0.136***	0.277***	0.318***	0.0837***	0.0990***
	(0.0180)	(0.0206)	(0.0524)	(0.0638)	(0.0203)	(0.0229)
Firm Size 100 to 249	0.113***	0.130***	0.196***	0.226***	0.0941***	0.110***
	(0.0158)	(0.0169)	(0.0418)	(0.0557)	(0.0199)	(0.0200)
$I_{t>R}$ (=1 after feb/2012)	**-0.0358**	**0.0615**	**0.0448**	**0.171**	**-0.0583**	**0.0299**
	(0.0462)	(0.0559)	(0.0761)	(0.145)	(0.0410)	(0.0471)

(*Continued*)

	Out of Employment		Permanent Contract		Temporary Contract	
Interaction Reform with firm size:						
$I_{t>R}$ * Firm Size 1 to 9	**-0.203***		**-0.272**		**-0.181***	
	(0.0620)		(0.176)		(0.0527)	
$I_{t>R}$ * Firm Size 10 to 24	**-0.110**		**-0.0791**		**-0.104*	
	(0.0553)		(0.158)		(0.0537)	
$I_{t>R}$ * Firm Size 25 to 49	**-0.0994**		**-0.0724**		**-0.106**	
	(0.0483)		(0.139)		(0.0482)	
$I_{t>R}$ * Firm Size 50 to 99	**-0.0484**		**-0.103**		**-0.0389**	
	(0.0431)		(0.137)		(0.0429)	
$I_{t>R}$ * Firm Size 100 to 249	**-0.0457**		**-0.0741**		**-0.0414**	
	(0.0374)		(0.100)		(0.0462)	
Constant Term	-2.552***	-2.584***	-6.719***	-6.763***	-2.373***	-2.402***
	(0.139)	(0.143)	(0.397)	(0.410)	(0.121)	(0.125)

Monthly data, coefficients of the competing-risk hazard models.
Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1
Source: "Muestra Continua de Vidas Laborales" (MCVL).

Table 11
THE IMPACT OF THE REFORM ON TRANSITIONS FROM EMPLOYMENT INTO UNEMPLOYMENT, BY FIRM SIZE

	Employment to Unemployment		Permanent Empl. to Unemployment		Temporary Empl. to Unemployment	
	Common trend	Different trend	Common trend	Different trend	Common trend	Different trend
$I_{t>R}$ (=1 after feb/2012)	-0.0447	0.0615	0.132	0.171	-0.0817	0.0299
Interaction Reform with firm size:						
$I_{t>R}$ * Firm Size 1 to 9	-0.203***	-0.203***	-0.271	-0.272	-0.181***	-0.181***
$I_{t>R}$ * Firm Size 10 to 24	-0.110**	-0.110**	-0.0788	-0.0791	-0.104*	-0.104*
$I_{t>R}$ * Firm Size 25 to 49	-0.0998**	-0.0994**	-0.0734	-0.0724	-0.106**	-0.106**
$I_{t>R}$ * Firm Size 50 to 99	-0.0494	-0.0484	-0.104	-0.103	-0.0395	-0.0389
$I_{t>R}$ * Firm Size 100 to 249	-0.0460	-0.0457	-0.0739	-0.0741	-0.0418	-0.0414
Firm Size:						
1 to 9	0.320***	0.319***	0.456***	0.456***	0.286***	0.285***
10 to 24	0.216***	0.216***	0.348***	0.348***	0.180***	0.180***
25 to 49	0.170***	0.169***	0.345***	0.345***	0.128***	0.127***
50 to 99	0.137***	0.136***	0.318***	0.318***	0.0993***	0.0990***
100 to 249	0.131***	0.130***	0.226***	0.226***	0.110***	0.110***
Polynomial trends:						
t	0.00264	-0.00829**	-0.00290	-0.00607	0.00376**	-0.00684**
t^2	0.000130***	-0.000252**	0.000144***	1.53e-05	0.000124**	-0.000246**
t^3	2.16e-06***	-1.39e-06	3.72e-06***	2.34e-06	1.88e-06***	-1.55e-06
t $I_{t>R}$		0.0209		0.000553		0.0236*
t^2 $I_{t>R}$		-0.00256**		-0.000653		-0.00285***
t^3 $I_{t>R}$		7.16e-05***		2.66e-05		7.85e-05***
Observations	3,716,388	3,716,388	1,996,781	1,996,781	1,719,607	1,719,607

Monthly data, coefficients of the competing-risk hazard models.
Polynomial trend (common/different) pre- and post-reform up to the 3rd degree.
Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1
Source: "Muestra Continua de Vidas Laborales" (MCVL).

Table 12

ESTIMATION RESULTS OF TRANSITIONS FROM EMPLOYMENT INTO UNEMPLOYMENT - POTENTIAL ENDOGENEITY OF THE PROVINCIAL EMPLOYMENT CONTROL VARIABLE

	Out of Employment				Permanent Contract				Temporary Contract			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
ΔlogE			-2.205*** (0.567)	-2.183*** (0.569)			-0.547 (1.318)	-0.501 (1.307)			-2.692*** (0.541)	-2.674*** (0.542)
ln (empl. duration) * ΔlogE			0.437 (0.328)	0.436 (0.330)			-0.709** (0.312)	-0.709** (0.311)			0.882*** (0.337)	0.880*** (0.338)
FEDEA Index	-0.0628*** (0.0118)	-0.0629*** (0.0118)	-0.0214 (0.0159)	-0.0221 (0.0159)	-0.0829*** (0.0195)	-0.0836*** (0.0195)	-0.0235 (0.0300)	-0.0253 (0.0299)	-0.0549*** (0.0116)	-0.0549*** (0.0116)	-0.0148 (0.0153)	-0.0153 (0.0153)
$I_{T>R}$ (=1 after feb/2012)	-0.0358 (0.0462)	0.0615 (0.0559)	-0.0227 (0.0478)	0.0761 (0.0571)	0.0448 (0.0761)	0.171 (0.145)	0.0692 (0.0758)	0.198 (0.145)	-0.0583 (0.0410)	0.0299 (0.0471)	-0.0474 (0.0431)	0.0424 (0.0490)
Interaction Reform with firm size:												
$I_{T>R}$ * Firm Size 1 to 9		-0.203*** (0.0620)		-0.205*** (0.0623)		-0.272 (0.176)		-0.276 (0.176)		-0.181*** (0.0527)		-0.183*** (0.0531)
$I_{T>R}$ * Firm Size 10 to 24		-0.110** (0.0553)		-0.113** (0.0555)		-0.0791 (0.158)		-0.0818 (0.159)		-0.104* (0.0537)		-0.107** (0.0541)
$I_{T>R}$ * Firm Size 25 to 49		-0.0994** (0.0483)		-0.103** (0.0484)		-0.0724 (0.139)		-0.0760 (0.140)		-0.106** (0.0482)		-0.110** (0.0484)
$I_{T>R}$ * Firm Size 50 to 99		-0.0484 (0.0431)		-0.0508 (0.0433)		-0.103 (0.137)		-0.107 (0.137)		-0.0389 (0.0429)		-0.0415 (0.0431)
$I_{T>R}$ * Firm Size 100 to 249		-0.0457 (0.0374)		-0.0486 (0.0375)		-0.0741 (0.100)		-0.0787 (0.101)		-0.0414 (0.0462)		-0.0444 (0.0464)

Monthly data, coefficients of the competing-risk hazard models.
Robust standard errors in parentheses.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Source: "Muestra Continua de Vidas Laborales" (MCVL).

Table 13

THE IMPACT OF THE REFORM ON TRANSITIONS FROM EMPLOYMENT INTO UNEMPLOYMENT, BY TYPE AND FIRM SIZE

	Exit from Permanent Employment to Unemployment (1)					Exit from Temporary Employment to Unemployment (1)				
ΔlogE	-0.501	-0.182	-0.792	0.450	-1.002	-2.674***	-3.133***	-1.951***	-2.885***	-2.593***
	(1.307)	(1.438)	(1.467)	(1.474)	(1.451)	(0.542)	(0.605)	(0.633)	(0.559)	(0.576)
ln (empl. duration) * ΔlogE	-0.709**	-0.804**	-0.558	-0.601	-0.660**	0.880***	0.867***	0.875**	0.843**	0.904***
	(0.311)	(0.350)	(0.396)	(0.428)	(0.333)	(0.338)	(0.315)	(0.418)	(0.354)	(0.341)
FEDEA Index	-0.0253	-0.0654**	0.00769	-0.0712**	-0.0104	-0.0153	-0.0143	-0.0206	-0.0196	-0.0129
	(0.0299)	(0.0311)	(0.0329)	(0.0344)	(0.0323)	(0.0153)	(0.0209)	(0.0131)	(0.0163)	(0.0162)
$I_{\triangleright R}$ (=1 after feb/2012)	0.171	0.111	0.239	0.328**	0.119	0.0299	0.0843	-0.00972	0.0110	0.0419
	(0.145)	(0.0911)	(0.187)	(0.154)	(0.145)	(0.0471)	(0.0573)	(0.0507)	(0.0585)	(0.0501)
Interaction Reform with firm size:										
$I_{\triangleright R}$ * Firm Size 1 to 9	-0.272	-0.261***	-0.276	-0.244**	-0.281	-0.181***	-0.204***	-0.184***	-0.187***	-0.187***
	(0.176)	(0.0843)	(0.242)	(0.115)	(0.196)	(0.0527)	(0.0483)	(0.0620)	(0.0585)	(0.0545)
$I_{\triangleright R}$ * Firm Size 10 to 24	-0.0791	-0.0918	-0.0804	-0.187	-0.0446	-0.104*	-0.128**	-0.125*	-0.0935	-0.117**
	(0.158)	(0.0823)	(0.214)	(0.120)	(0.173)	(0.0537)	(0.0517)	(0.0645)	(0.0708)	(0.0537)
$I_{\triangleright R}$ * Firm Size 25 to 49	-0.0724	-0.0363	-0.121	-0.176*	-0.0550	-0.106**	-0.162***	-0.0837	-0.122**	-0.106**
	(0.139)	(0.0771)	(0.189)	(0.0980)	(0.160)	(0.0482)	(0.0508)	(0.0516)	(0.0603)	(0.0521)
$I_{\triangleright R}$ * Firm Size 50 to 99	-0.103	-0.0847	-0.129	-0.0851	-0.115	-0.0389	-0.0542	-0.0615	-0.00241	-0.0581
	(0.137)	(0.0970)	(0.180)	(0.123)	(0.152)	(0.0429)	(0.0515)	(0.0455)	(0.0574)	(0.0481)
$I_{\triangleright R}$ * Firm Size 100 to 249	-0.0741	-0.0602	-0.123	-0.0909	-0.0652	-0.0414	-0.0711	-0.0339	0.0156	-0.0732
	(0.100)	(0.0888)	(0.118)	(0.127)	(0.113)	(0.0462)	(0.0503)	(0.0527)	(0.0647)	(0.0467)

Monthly data, coefficients of the competing-risk hazard models.
Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1
(1) In this specification transitions to a new job are considered as censored observations.
Source: "Muestra Continua de Vidas Laborales" (MCVL).

Table 14
**THE IMPACT OF THE REFORM ON TRANSITIONS FROM EMPLOYMENT INTO
UNEMPLOYMENT OR ANOTHER JOB, BY FIRM SIZE**

	Out of Employment		Permanent Contract		Temporary Contract	
	Job-to-Unem	Job-to-job	Job-to-Unem	Job-to-job	Job-to-Unem	Job-to-job
t	0.00257***	-0.00709***	0.00126	-0.00459***	0.00296***	-0.00783***
	(0.000545)	(0.000595)	(0.000986)	(0.000879)	(0.000511)	(0.000661)
t $I_{t>R}$	0.00684**	0.00451	0.00700**	0.000989	0.00653*	0.00553
	(0.00336)	(0.00479)	(0.00312)	(0.00595)	(0.00354)	(0.00453)
$\Delta\log E$	-2.021***	0.150	-1.502	-1.320	-2.352***	0.199
	(0.528)	(0.561)	(1.129)	(0.987)	(0.473)	(0.539)
ln (empl. duration) * $\Delta\log E$	0.438	-0.0112	-0.408	0.0680	0.852**	0.172
	(0.324)	(0.189)	(0.301)	(0.304)	(0.336)	(0.188)
FEDEA Index	-0.0480***	0.103***	-0.0543*	0.147***	-0.0406**	0.0923***
	(0.0176)	(0.0206)	(0.0313)	(0.0312)	(0.0163)	(0.0208)
Firm Size 1 to 9	0.320***	0.0203	0.455***	-0.0165	0.285***	0.0158
	(0.0235)	(0.0177)	(0.0876)	(0.0315)	(0.0215)	(0.0197)
Firm Size 10 to 24	0.217***	0.0345*	0.345***	-0.0597	0.181***	0.0456**
	(0.0232)	(0.0183)	(0.0806)	(0.0408)	(0.0236)	(0.0220)
Firm Size 25 to 49	0.171***	0.0619***	0.343***	-0.0452	0.130***	0.0747***
	(0.0218)	(0.0202)	(0.0731)	(0.0379)	(0.0228)	(0.0220)
Firm Size 50 to 99	0.137***	0.0438*	0.316***	-0.0116	0.101***	0.0447*
	(0.0208)	(0.0240)	(0.0639)	(0.0406)	(0.0231)	(0.0265)
Firm Size 100 to 249	0.129***	-0.00687	0.224***	-0.00857	0.108***	-0.0160
	(0.0170)	(0.0216)	(0.0558)	(0.0414)	(0.0202)	(0.0242)
$I_{t>R}$ (=1 after feb/2012)	**-0.121****	**0.186***	**-0.0538	**0.139	**-0.133***	**0.202***
	(0.0516)	(0.0666)	(0.132)	(0.109)	(0.0478)	(0.0620)
Interaction Reform with firm size:						
$I_{t>R}$ * Firm Size 1 to 9	**-0.203***	**-0.0277	**-0.269	**-0.0128	**-0.182***	**-0.0368
	(0.0627)	(0.0331)	(0.176)	(0.0802)	(0.0535)	(0.0339)
$I_{t>R}$ * Firm Size 10 to 24	**-0.108*	**0.0102	**-0.0736	**0.0957	**-0.103*	**-0.0222
	(0.0557)	(0.0324)	(0.159)	(0.0858)	(0.0544)	(0.0415)
$I_{t>R}$ * Firm Size 25 to 49	**-0.0988**	**-0.00789	**-0.0697	**0.112	**-0.107**	**-0.0475
	(0.0487)	(0.0412)	(0.140)	(0.102)	(0.0487)	(0.0500)
$I_{t>R}$ * Firm Size 50 to 99	**-0.0505	**-0.0431	**-0.100	**0.0749	**-0.0424	**-0.0761
	(0.0434)	(0.0443)	(0.137)	(0.0873)	(0.0434)	(0.0538)
$I_{t>R}$ * Firm Size 100 to 249	**-0.0439	**0.0148	**-0.0703	**0.00976	**-0.0402	**0.0121
	(0.0378)	(0.0453)	(0.101)	(0.0954)	(0.0472)	(0.0513)

Monthly data, coefficients of the competing-risk hazard models.
Robust standard errors in parentheses. Linear polynomial pre and post reform.
*** p<0.01, ** p<0.05, * p<0.1*
Source: "Muestra Continua de Vidas Laborales" (MCVL).

Table 15

THE IMPACT OF THE REFORM ON TRANSITIONS FROM EMPLOYMENT INTO UNEMPLOYMENT OR ANOTHER JOB, BY FIRM SIZE

	Exit from Permanent Employment to Unemployment									
	All		Women		Men		Young (<30y)		Old(>30y)	
	Job-to-Unem	Job-to-job	Job-to-Unem	Job-to-job	Job-to-Unem	Job-to-job	Job-to-Unem	Job-to-job	Job-to-Unem	Job-to-job
$\Delta \log E$	-1.502	-1.320	-1.448	-1.283	-1.495	-1.524	-1.333	-4.241***	-1.735	-0.0717
	(1.129)	(0.987)	(1.249)	(1.179)	(1.280)	(1.158)	(1.292)	(1.336)	(1.244)	(1.163)
ln (empl. duration) * $\Delta \log E$	-0.408	0.0680	-0.362	0.0298	-0.416	0.181	-0.146	0.903**	-0.419	-0.287
	(0.301)	(0.304)	(0.330)	(0.358)	(0.396)	(0.375)	(0.405)	(0.424)	(0.323)	(0.340)
FEDEA Index	-0.0543*	0.147***	-0.110***	0.151***	-0.00699	0.142***	-0.100***	0.203***	-0.0382	0.122***
	(0.0313)	(0.0312)	(0.0330)	(0.0342)	(0.0322)	(0.0376)	(0.0359)	(0.0415)	(0.0330)	(0.0328)
$I_{t>R}$ (=1 after feb/2012)	-0.0538	0.139	-0.0911	0.0577	-0.0148	0.240**	-0.0115	0.125	-0.0592	0.142
$I_{t>R}$	(0.132)	(0.109)	(0.0735)	(0.121)	(0.167)	(0.109)	(0.104)	(0.105)	(0.140)	(0.119)
Interaction Reform with firm size:										
$I_{t>R}$ * Firm Size 1 to 9	-0.269	-0.0128	-0.255***	0.0523	-0.275	-0.0943	-0.239**	0.0176	-0.278	-0.0337
	(0.176)	(0.0802)	(0.0840)	(0.0895)	(0.243)	(0.0992)	(0.115)	(0.0905)	(0.196)	(0.0948)
$I_{t>R}$ * Firm Size 10 to 24	-0.0736	0.0957	-0.0843	0.173*	-0.0765	-0.0137	-0.182	0.0408	-0.0393	0.107
	(0.159)	(0.0858)	(0.0823)	(0.103)	(0.215)	(0.113)	(0.119)	(0.121)	(0.173)	(0.0966)
$I_{t>R}$ * Firm Size 25 to 49	-0.0697	0.112	-0.0347	0.121	-0.117	0.122	-0.172*	0.189	-0.0529	0.0855
	(0.140)	(0.102)	(0.0770)	(0.125)	(0.189)	(0.125)	(0.0981)	(0.132)	(0.161)	(0.116)
$I_{t>R}$ * Firm Size 50 to 99	-0.100	0.0749	-0.0792	0.116	-0.129	0.0328	-0.0825	0.00208	-0.113	0.0873
	(0.137)	(0.0873)	(0.0972)	(0.105)	(0.181)	(0.117)	(0.123)	(0.166)	(0.153)	(0.105)
$I_{t>R}$ * Firm Size 100 to 249	-0.0703	0.00976	-0.0561	0.00351	-0.119	0.0298	-0.0854	-0.116	-0.0617	0.0423
	(0.101)	(0.0954)	(0.0890)	(0.110)	(0.118)	(0.122)	(0.127)	(0.140)	(0.113)	(0.120)

Monthly data, coefficients of the competing-risk hazard models.
Robust standard errors in parentheses. Linear polynomial pre and post reform.
*** p<0.01, ** p<0.05, * p<0.1.*
Source: "Muestra Continua de Vidas Laborales" (MCVL).

Table 15 (Continued)

THE IMPACT OF THE REFORM ON TRANSITIONS FROM EMPLOYMENT INTO UNEMPLOYMENT OR ANOTHER JOB, BY FIRM SIZE

Exit from Temporary Employment to Unemployment

	All		Women		Men		Young (<30y)		Old(>30y)	
	Job-to-Unem	Job-to-job	Job-to-Unem	Job-to-job	Job-to-Unem	Job-to-job	Job-to-Unem	Job-to-job	Job-to-Unem	Job-to-job
$\Delta \log E$	-2.352***	0.199	-3.170***	0.288	-1.145**	-0.342	-2.594***	-0.756	-2.271***	0.691
	(0.473)	(0.539)	(0.536)	(0.594)	(0.559)	(0.655)	(0.503)	(0.702)	(0.498)	(0.580)
ln (empl. duration) * $\Delta \log E$	0.852**	0.172	0.883***	0.184	0.772*	0.237	0.802**	0.626***	0.882***	-0.0693
	(0.336)	(0.188)	(0.307)	(0.211)	(0.425)	(0.273)	(0.352)	(0.228)	(0.340)	(0.226)
FEDEA Index	-0.0406**	0.0923***	-0.0449**	0.0955***	-0.0368***	0.0934***	-0.0372**	0.115***	-0.0422**	0.0805***
	(0.0163)	(0.0208)	(0.0224)	(0.0251)	(0.0132)	(0.0205)	(0.0170)	(0.0256)	(0.0173)	(0.0231)
$I_{t>R}$ (=1 after feb/2012)	-0.133***	0.202***	-0.180***	0.213***	-0.0378	0.150**	-0.122***	0.193***	-0.134**	0.204***
$I_{t>R}$	(0.0478)	(0.0620)	(0.0558)	(0.0744)	(0.0452)	(0.0666)	(0.0431)	(0.0749)	(0.0532)	(0.0643)
Interaction Reform with firm size:										
$I_{t>R}$ * Firm Size 1 to 9	-0.182***	-0.0368	-0.205***	-0.0372	-0.185***	0.00630	-0.188***	-0.0223	-0.187***	-0.0426
	(0.0535)	(0.0339)	(0.0492)	(0.0384)	(0.0625)	(0.0491)	(0.0590)	(0.0588)	(0.0555)	(0.0387)
$I_{t>R}$ * Firm Size 10 to 24	-0.103*	-0.0222	-0.124**	0.00141	-0.129**	-0.0240	-0.0889	0.0287	-0.117**	-0.0472
	(0.0544)	(0.0415)	(0.0521)	(0.0542)	(0.0657)	(0.0668)	(0.0711)	(0.0691)	(0.0543)	(0.0466)
$I_{t>R}$ * Firm Size 25 to 49	-0.107**	-0.0475	-0.161***	0.00252	-0.0871*	-0.0931	-0.123**	0.0312	-0.107**	-0.0801
	(0.0487)	(0.0500)	(0.0515)	(0.0564)	(0.0519)	(0.0735)	(0.0615)	(0.0830)	(0.0526)	(0.0545)
$I_{t>R}$ * Firm Size 50 to 99	-0.0424	-0.0761	-0.0574	-0.102	-0.0651	-0.00125	-0.00750	-0.0912	-0.0610	-0.0685
	(0.0434)	(0.0538)	(0.0514)	(0.0656)	(0.0463)	(0.0725)	(0.0581)	(0.0855)	(0.0481)	(0.0601)
$I_{t>R}$ * Firm Size 100 to 249	-0.0402	0.0121	-0.0673	0.0223	-0.0357	0.0138	0.0207	0.0711	-0.0735	-0.0157
	(0.0472)	(0.0513)	(0.0512)	(0.0678)	(0.0537)	(0.0621)	(0.0653)	(0.0928)	(0.0478)	(0.0574)

Monthly data, coefficients of the competing-risk hazard models.
Robust standard errors in parentheses. Linear polynomial pre and post reform.
*** p<0.01, ** p<0.05, * p<0.1.*
Source: "Muestra Continua de Vidas Laborales" (MCVL).

Table 16

THE IMPACT OF THE REFORM ON TRANSITIONS FROM EMPLOYMENT INTO UNEMPLOYMENT, A NEW PERMANENT CONTRACT, BY FIRM SIZE

	Out of Employment			Permanent Contract			Temporary Contract		
	Job-to-Unem	Job-to-job to a TC	Job-to-job to a PC	Job-to-Unem	Job-to-job to a TC	Job-to-job to a PC	Job-to-Unem	Job-to-job to a TC	Job-to-job to a PC
t	0.00253***	-0.00843***	-0.00431***	0.00124	-0.0107***	-0.00170*	0.0296***	-0.00809***	-0.00856***
	(0.000544)	(0.000653)	(0.000824)	(0.000987)	(0.00137)	(0.00100)	(0.000511)	(0.000665)	(0.00139)
t $I_{t>R}$	0.00689**	0.00529	0.00187	0.00701**	0.00392	-4.59e-05	0.00655*	0.00503	0.00513
	(0.00336)	(0.00457)	(0.00592)	(0.00312)	(0.00582)	(0.00672)	(0.00354)	(0.00456)	(0.00583)
$I_{t>R}$ (=1 after feb/2012)	-0.120**	0.223***	0.128	-0.0542	-0.0587	0.111	-0.133***	0.250***	0.0559
	(0.0517)	(0.0635)	(0.100)	(0.132)	(0.134)	(0.123)	(0.0479)	(0.0632)	(0.104)
Interaction with firm size:									
$I_{t>R}$ * Firm Size 1 to 9	-0.203***	-0.0553	-0.000636	-0.268	0.285**	-0.00700	-0.183***	-0.0771**	0.0997
	(0.0627)	(0.0365)	(0.0828)	(0.176)	(0.130)	(0.105)	(0.0536)	(0.0363)	(0.110)
$I_{t>R}$ * Firm Size 10 to 24	-0.109*	-0.0360	0.171**	-0.0726	0.369**	0.116	-0.104*	-0.0757*	0.347***
	(0.0558)	(0.0372)	(0.0854)	(0.159)	(0.156)	(0.113)	(0.0544)	(0.0457)	(0.105)
$I_{t>R}$ * Firm Size 25 to 49	-0.0999**	-0.0572	0.181**	-0.0696	0.309*	0.129	-0.107**	-0.0912*	0.315***
	(0.0487)	(0.0462)	(0.0885)	(0.140)	(0.172)	(0.116)	(0.0488)	(0.0539)	(0.116)
$I_{t>R}$ * Firm Size 50 to 99	-0.0517	-0.0889*	0.109	-0.0998	0.245	0.0736	-0.0432	-0.118**	0.206*
	(0.0435)	(0.0536)	(0.0769)	(0.137)	(0.155)	(0.104)	(0.0434)	(0.0565)	(0.109)
$I_{t>R}$ * Firm Size 100 to 249	-0.0449	-0.0136	0.0963	-0.0696	0.239*	-0.0149	-0.0412	-0.0342	0.346**
	(0.0379)	(0.0521)	(0.0971)	(0.101)	(0.128)	(0.116)	(0.0472)	(0.0571)	(0.146)

Monthly data, coefficients of the competing-risk hazard models.
Robust standard errors in parentheses. Linear polynomial pre and post reform.
*** p<0.01, ** p<0.05, * p<0.1.
Source: "Muestra Continua de Vidas Laborales" (MCVL).

Table 17
THE EFFECT OF THE REFORM ON THE TRANSITION FROM EMPLOYMENT
CONTROLLING FOR UNOBSERVED HETEROGENEITY

	All workers		Permanent Workers		Temporary Workers	
	No Un-observ. Heterog. Control	With Unobsev. Heterog. Control	No Un-observ. Heterog. Control	With Unobsev. Heterog. Control	No Un-observ. Heterog. Control	With Unobsev. Heterog. Control
ln(empl. duration)	0,5041**	0,4217***	2,6483***	1,9645***	0,6484***	0,5930***
ln(empl. duration)^2	-0,3200***	-0,2174***	-0,9281***	-0,4609***	-0,4448***	-0,3786***
ln(empl. duration)^3	0,0239	0,0078	0,0795***	0,0140	0,0418**	0,0325***
t	-0,0083**	-0,0098***	-0,0061	-0,0098**	-0,0068**	-0,0079***
t^2	-0,0003**	-0,0003***	0,0000	-0,0001	-0,0002**	-0,0003***
t^3	0,0000	0,0000***	0,0000*	0,0000	0,0000	0,0000***
$t\ I_{t>R}$	0,0209	0,0235***	0,0006	-0,0025	0,0236*	0,0256***
$t^2\ I_{t>R}$	-0,0026**	-0,0028***	-0,0007	-0,0005	-0,0028***	-0,0031***
$t^3\ I_{t>R}$	0,0001***	0,0001***	0,0000	0,0000	0,0001***	0,0001***
$I_{t>R}$ (=1 after feb/2012)	0,0615	0,0474	0,1714	0,1257	0,0299	0,0199
$I_{t>R}$ * Firm Size 1 to 9	-0,2033***	-0,1848***	-0,2717***	-0,1815***	-0,1812***	-0,1666***
$I_{t>R}$ * Firm Size 10 to 24	-0,1101**	-0,0802***	-0,0791*	0,0010	-0,1044**	-0,0814***
$I_{t>R}$ * Firm Size 25 to 49	-0,0994**	-0,0787***	-0,0724	0,0027	-0,1058**	-0,0886***
$I_{t>R}$ * Firm Size 50 to 99	-0,0484	-0,0302	-0,1030**	-0,1086*	-0,0389	-0,0285
$I_{t>R}$ * Firm Size 100 to 249	-0,0457	-0,0238	-0,0741	-0,0643	-0,0414	-0,0233
Constant Term	-2,5844***	-1,9734***	-6,7629***	-5,0433***	-2,4020***	-2,0848***
Heterog. Inobserv. component						
$\eta1$		-1,0498***		-2,1738***		-0,9519***
$Pr(\eta = \eta1)$		0,5982***		0,2581***		0,6603***

Monthly data.
Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1*
Source: "Muestra Continua de Vidas Laborales" (MCVL).

Notes

1. Their conclusions concerning wages essentially pointed to an advance in terms of real wage flexibility. They also document a strong rise in pay freezes and a delay in the renewal of collective agreements that made wages adjust to accommodate huge employment reallocations within firms.

2. We treat a duration outcome as categorical in a regression discontinuity design (RDD). Recent examples of discretized duration outcomes in the RDD setting can be found in Caliendo, Tatsiramos and Uhlendorff (2013) and Landais (2015). A review of regression discontinuities with categorical outcomes exploited by researchers in the RDD literature is developed by Xu (2017).

3. Most of these issues were clarified by several legal changes in 2013 (Real Decreto Ley 5/2013, Reald Decreto Ley 11/2013).

4. Gamberoni *et al*. (2016) analyse the effects of these hiring incentives by means of a regression discontinuity design based on the firm size restriction for these new contracts. By using firm-level data, they conclude that these subsidies show small but positive effects on the hiring decision of firms.

5. However, the FOGASA subsidy was dropped at the end of 2013. Otherwise, small employers would have been liable from that date for disbursing the same amount for open-ended and temporary contracts, in the case of fair dismissal, because the 2010 reform raised severance pay for fixed-term contracts to 12 days per year of service beginning in 2014.

6. See García-Pérez (2008) for further details on the MCVL data and their usefulness for studying labour market transitions.

7. It is important to emphasize that in this paper 'unemployment spells' refer to non-employment spells including unemployment or inactivity. Individuals only appear in the records when they pay Social Security contributions-roughly, if they are either employed or non-employed and receiving unemployment benefits. No information about job search activity is available in the data set, hence we cannot distinguish between unemployed and nonparticipating individuals.

8. The educational level is proxied in this paper by 'grupo de cotización'. Therefore, this variable is the qualification required by the job, which is not always equivalent to the workers' qualification.

9. The FEDEA index of economic activity is an indicator that summarizes the evolution of economic activity in Spain using information available from many different sources (e.g., GDP, industrial production, and indices of economic sentiment). For further information, see http://www.fedea.net/indice/indice-f.html.

10. Those employment or unemployment spells ending into retirement are both treated as right censored in the first month retirement benefits are received.

11. The estimation sample is composed of 196,585 individuals for whom we observe 362,957 unemployment spells and 341,642 employment spells. More information about this sample can be found in García Pérez (2016).

12. The *Acuerdo sobre Empleo y Negociacion Colectiva* was approved by employer associations and labour unions on the 25th of January 2012.

13. Nevertheless, our estimation does not consider the time remaining until payments are exhausted, in contrast to García-Pérez and Rebollo (2015). The adjustment of the unemployment benefits replacement rates from 60 to 50%, which was approved by the Government in July 2012, could be the cause of the pronounced negative effect shown by this variable in our estimations.

14. These results are available upon request from the authors but are not shown to save on space for the remaining results in the paper.

15. In fact, the specification shown in Table 8 only estimates one mass point, η_1, because the model also has a constant term. Thus, the first mass point is fixed to zero, and η_2 represents the additional effect of being in the second mass point. The probability in this table is capturing the share of the sample in the second mass point.

16. The marginal positive impact of the reform on the direct transition to a new temporary contract for those already in a permanent contract is somewhat surprising. They might be the results of voluntary transitions. In any case, this transition is very low in monthly terms (0.25% on average); therefore, the positive effect shown in Table 16 for small firms only changes this transition rate marginally (from 0.25 to 0.33% on average).

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Resumen

Este artículo analiza el impacto de la reforma del mercado laboral español de 2012 en la probabilidad de salir y entrar al desempleo utilizando un enfoque de regresión discontinua basado en modelos de duración. La reforma laboral de 2012 modificó importantes aspectos de las reglas de contratación y de despido en España. Con ello, modificó la probabilidad de salir tanto del empleo como del desempleo. Comparando el desempeño del mercado laboral antes y después de febrero de 2012 y utilizando un modelo de duración de riesgo competitivo para la salida tanto del empleo como del desempleo, encontramos que la reforma laboral contribuyó a la creación de empleo de dos formas. En primer lugar, aumentó la probabilidad de salir del desempleo al empleo al aumentar la transición mensual al empleo fijo del 1,7% al 2,6% en promedio durante los primeros doce meses de desempleo. En segundo lugar, redujo la probabilidad de salir del empleo para los trabajadores con un contrato temporal, particularmente en las pequeñas empresas, probablemente porque estas empresas pudieron utilizar medidas de flexibilidad interna recientemente introducidas para ajustar la fuerza laboral en lugar de medidas de flexibilidad externas. La reforma laboral también facilitó la transición directa de empleos temporales a fijos. Finalmente, no encontramos ningún efecto significativo de la reforma en los patrones de despido de los trabajadores con contratos fijos. Estos resultados apuntan a un efecto positivo de la reforma en términos de reducción de la extrema dualidad laboral del mercado de trabajo español, aunque el impacto fue hasta ahora pequeño, lo que indica que será necesario un mayor esfuerzo para reducir de manera sustancial la fuerte dualidad de este mercado laboral.

Palabras clave: reforma laboral, regresión discontinua, tasa de riesgo de desempleo, tasa de riesgo de empleo.

Clasificación JEL: J41, J64, C41