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Queen Mary University of London,
NovaSBE and IZA

ABSTRACT

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Fixed-term contracts (FTCs) may be an important tool to promote hirings and employment, particularly in recessions or when permanent contracts are costly. Therefore, it may be useful to let some of the legal parameters of FTCs (as well as those of other labour market institutions) vary systematically over the business cycle, namely increasing their flexibility during downturns. We evaluate this idea by examining the short-term effects of a new law introduced in Portugal, in the midst of a recession, which increased the maximum duration of FTCs from three to four and a half years. Our analysis is based on regression-discontinuity (and difference-in-differences) methods, applied to matched panel data. We find a considerable take up of this measure, as conversions to permanent contracts drop by 20%. Moreover, while we do not detect significant effects on employment status in the subsequent year, worker churning is reduced significantly, as mobility of eligible fixed-term workers to other firms drops by 10%.

JEL Classification: J23, J41, J63

Keywords: employment law, worker mobility, segmentation, counterfactual evaluation

Corresponding author:

Pedro S. Martins
School of Business and Management
Queen Mary, University of London
Mile End Road
London E1 4NS
United Kingdom
E-mail: p.martins@qmul.ac.uk

1 Introduction

This paper presents a case for greater flexibility in the parameterisation of labour market regulations and institutions (unemployment benefits, tax wedges, activation practices, minimum wages, etc) as a tool to reduce the employment volatility associated to business cycles. In particular, we study the effects of greater flexibility in one such institution, fixed-term contracts (FTCs, henceforth), in recessions.

To our knowledge this approach about systematically greater responsiveness of labour regulations to the business cycle has only received some attention in the specific case of the extensions of unemployment benefits in periods of high unemployment (see Hagedorn et al. (2016) and its references for the evaluations of the U.S. case). However, we argue that it may be particularly fruitful to work towards 'Taylor's rules' (Taylor 1993) for many other labour market institutions, given their economic impacts and the many legal parameters that characterise such regulations and that can vary widely across countries (OECD 2014).

For instance, in the case of the maximum duration of FTCs studied here, again according to OECD (2014), in France, it is 18 months in the general case, further varying from 9 to 24 months, depending on the nature of the appointment. In Germany, the maximum duration is 24 months, but reaching 48 months, when launching a new business, or 60 months, when hiring older unemployed, or even unlimited, if there is an objective reason. In Italy, it is 36 months, with extensions possible in some cases or through collective bargaining, but only 12 months if no particular reason offered. In Spain and the UK, the maximum duration is 48 months, while in Poland and the US there is no limit.

Of course, FTCs have received considerable attention in the academic literature, in particular in the context of the debates on the costs of benefits of FTCs and, more generally, about labour market segmentation (Booth et al. 2002, Blanchard & Landier 2002, Bentolila et al. 2012, Garcia Perez et al. 2016, Charlot et al. 2016). This literature has also discussed different motivations for FTCs, which we group in terms of screening, bargaining/incentives and uncertainty considerations. However, we do not know of any studies that examine the effects of specific parameters of FTCs, as in our case in which we focus on their maximum duration. Moreover, a more focused approach in the analysis of specific components of labour market regulations can be instrumental in bridging the sometimes large gap between academic research and policy making.

We conduct an evaluation of a reform implemented in Portugal in 2012, in the midst of a recession. This reform involved the increase in the maximum duration of FTCs, from three years up to four and a half years. Moreover, the reform was designed in such a way that only some workers on FTCs were eligible, in particular those hired sufficiently late to hit the old maximum duration once the new law was in force. Drawing on matched employer-employee longitudinal data and regression discontinuity (Hahn et al. 2001) and difference-in-differences methods, we evaluate the effects of the reform in terms of different outcomes of interest, including short-term employment, conversion and inter-firm mobility probabilities.

The structure of the paper is as follows: the next Section presents the FTC reform. Section 3 presents the data sets and their descriptive statistics. The main results on both take up and outcomes of interest are presented in Section 4. Section 5 presents robustness checks and extensions. Finally, Section 6 concludes.

2 The fixed-term contract reform in Portugal

Similarly to several other countries, FTCs in Portugal are subject to a number of restrictions. Specifically, the Portuguese labour code indicates that FTCs can in general only be made to meet a temporary need of the firm and only for the period required to meet that need, subject to a maximum duration of three years in total. FTCs can also be established when a firm launches a new activity of uncertain duration or when a firm hires a long-term unemployed individual or a worker searching for her first job, in which cases the maximum total durations are 18 and 24 months, respectively (articles 140 and 148). FTCs are also subject to a maximum number of renewals (three), implying that in cases of shorter contracts, FTCs will reach their maximum duration even before the 18-, 24- or 36-month time limits above. These restrictions are in line with the EU Directive that regulates FTCs (1999/70/EC) and which seeks to ensure that workers on FTCs do not suffer unjustified discrimination and to prevent abuse of successive fixed-term contracts between the same employer and employee for the same work.

Before or by the maximum duration of an FTC, the firm and the worker decide on the termination of the FTC employment spell or its conversion into a permanent contract. In the latter case, the contract is automatically subject to much greater protection against dismissal, not necessarily in terms of grounds for required motives, severance costs, or dismissal procedures but above all in terms of legal uncertainty, including possible reinstatements (in case the

3

dismissal is challenged in court), as indicated in the Portuguese labour code.[1] Any FTC that would last longer than the applicable FTC maximum duration would also be automatically and implicitly converted into a permanent contract. Similarly, any new FTC established for the same job immediately or soon after the old one (over a period less than one third of the total duration of the previous contract) may also be regarded as permanent by an employment tribunal, even if the new contract is made with a different worker.

These large gaps in protection between FTCs and permanent contracts and the resulting costs for firms apply in most countries but particularly so in Portugal, where individual dismissals are the most restrictive across the OECD (OECD 2014). These circumstances - together with the relatively large size of seasonal or volatile sectors (such as tourism, construction or agriculture) and the low economic growth rates, two recessions and resulting economic uncertainty over the last decade - explain the very large percentage of workers under FTCs in Portugal (22%), the third largest in the European Union. From a flows perspective, these shares are even higher: 70% of the workers employed in October 2011 and hired in that year were employed under FTCs (own calculations, based on the 'Quadros de Pessoal' data described below). Moreover, over 40% of the registrations of newly-unemployed individuals with the public employment service in any month also arise from terminations of FTCs.

In the context of a recession and of several other labour market reforms, including a reduction of the protection of all permanent contracts which came into force in August 2012, the government of Portugal decided in late 2011 to temporarily reduce some of the FTC restrictions above, in particular those regarding their maximum duration. This policy was originally proposed during the June 2011 general elections by a political party that went on to be a junior member of the ruling coalition, although it did not receive much attention at that time.[2]

The measure - referred to as 'extraordinary renewal' ('renovação extraordinária') - was motivated by the view that, given the ongoing recession, the consequent economic uncertainty and the restrictions applicable to the termination of permanent contracts described above, many firms would not convert their current FTCs approaching their maximum duration and resort instead to dismissals of otherwise still productive matches, with significant negative

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[1] See Cahuc et al. (2016) for the different case of France, characterised by greater protection of FTCs.

[2] See Martins & Pessoa e Costa (2014), Hijzen & Martins (2016) and Martins (2016) for evaluations of other labour market reforms implemented in Portugal over this period. The first two papers also apply a regression-discontinuity approach, similarly to the case of this paper.

consequences upon employment. Following a discussion of the draft law with union and employer confederations in late September 2011 - which generally expressed considerable interest in the measure - and the submission of the draft law to parliament in October, this law was approved in December 9th, 2011, finally being published and coming into force in January 11th, 2012.

The new law (3/2012) allowed fixed term contracts that would reach their maximum duration between the time the law came into force up to June 2013 to be subject to two additional renewals. In total, these two renewals could not be longer than 18 months or shorter than one sixth of the maximum duration of the contract, therefore allowing for a considerable increase in the until then maximum duration of FTCs, of three years in the general case.

The setup of the law in terms of the timing of its coming into force was such that, amongst the FTCs approaching their maximum duration towards the end of 2011 or early 2012, only those FTCs reaching that duration threshold from January 11th, 2012, would be allowed to extend further their duration. In particular, three-year FTCs started up to early January 2009 are necessarily not eligible, while similar FTCs originally signed from late January 2009 could benefit from further extensions according to the new applicable law.

In other words, some workers will have been hired 'too early', in the sense that they will reach the conversion deadline before the FTC extension is legally possible and will therefore be confronted with the until then standard 'up or out' decision. However, the workers hired even only a few days later will qualify for a third possibility: one or two further extensions, still under an FTC. This legal setup creates a sharp discontinuity in eligibility which we exploit in our econometric analysis described below.

It is also interesting to note that the law that we study in this paper was subsequently subject to a further extension itself. A new law (76/2013) came into force in November 2013, outside the time frame of our analysis, allowing for additional renewals of FTCs, for up to 12 months, over the following two years. However, following the recovery of the economy and employment levels since 2013, the maximum duration of FTCs has returned to three years and there are no further plans for additional extensions.

From a theoretical perspective, we argue that screening or stepping-stone considerations (Booth et al. 2002, Faccini 2014) will play a small role in our results, given that the work-

ers will have been in the firm for up to three years, a time period long enough to reduce significantly any information asymmetries about the match quality. On the other hand, bargaining/incentives and uncertainty considerations are likely to be important factors that make us expect a significant take up of the measure, as well as positive effects on employment and negative effects on inter-firm mobility. First, a weaker labour market implies fewer outside options for workers, resulting in a weaker bargaining position and stronger incentives for them (Ichino & Riphahn 2005, Martins 2009). Second, a recession will typically imply that the firm will face greater uncertainty in the product market and in the resulting derived labour demand, with negative effects on their propensity to invest (Bloom 2009), including in permanent contracts.[3]

3 Data and descriptive statistics

We use the 'Quadros de Pessoal' data set, a comprehensive matched employer-employee panel. This data set provides detailed annual information on all firms based in Portugal that employ at least one worker and all their employees, including time-invariant firm and person identifiers. All worker information concerns the month of October of each year and includes gender, date of birth, schooling, occupation, salary, hours of work, etc. Critically for the purposes of our paper, the data set includes information on the type of contract (including permanent and different types of non-permanent contracts, including FTCs) of each worker as well as the month and year when their contract started (henceforth referred to as the hiring date).[4] However, the data does not include information on the expected duration of the FTC, the number of FTCs during the employment spell nor the number or dates of their renewals. In our analysis, we focus on data for 2011 and 2012, the most recent years currently available.

Given the nature of the FTC maximum duration measure, we restrict our sample of interest to workers employed under FTCs in the 2011 data (i.e. employed in October 2011), and originally hired between October 2008 and September 2009. (We also drop from the sample workers employed in more than one firm in 2011.) This time window is defined so that we are sure that these individuals are approaching the maximum duration of their FTCs

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[3]Caggese & Cunat (2008) presents evidence that financially constrained firms in recessions tend to use fixed-term workers more intensely and make those workers absorb a larger fraction of the total employment volatility than financially unconstrained firms.

[4]See Portugal & Varejao (2010), Centeno & Novo (2012), and Damas de Matos & Parent (2016) for previous studies using the FTC variable in QP. See also Martins (2014) for an analysis of a different form of non-standard work, service providers, not available in QP.

either immediately before or immediately after the day when the longer FTC became legally possible.

In more specific terms, individuals hired between October 2008 and early January 2009 (and still employed in October 2011) will reach the maximum possible duration of their FTC before the 2012 law is in force. On the other hand, individuals hired between late January 2009 and September 2009 (and, again, still employed in October 2011) will reach the maximum possible duration of their FTC when the 2012 law is in force and are therefore eligible to have their FTC extended. Moreover, we do not consider individuals hired before October 2008 as they could not be observed as FTC in October 2011. Similarly, we do not consider individuals hired from October 2009, as they would not necessarily be subject to the new law if they were to be observed as FTC in October 2012. Given that the QP data indicates the month and year of hiring (start date) but not its day, we assume that those hired in January 2009 are hired before the 11th (the day the measure comes into force, in 2012) as long contracts such as those considered in this paper tend to start in the first day of the month.

At this stage, it is also important to note that the group of workers that we examine in this paper is not the only one that would be subject to the reform. Potentially many other workers on FTCs but on shorter employment spells would be bound by the maximum duration or maximum renewals criteria in such a way that the new law would also be applicable to them. Moreover, one may expect a greater employment effect from a measure such as the one evaluated here, when compared to the higher-tenure group of workers that we are able to evaluate. In fact, shorter employment matches are more fragile as they tend to generate less surplus (wages are known to increase very strongly during the first years of tenure - see Martins et al. (2016) and the references therein). Furthermore, the key screening process conducted by firms through FTCs is more likely to still be on-going in the case of short FTC employment spells, making the conversion decision even more challenging.

Finally, we use the worker identifiers to track these individuals in the 2012 data and create a number of outcome variables. These include the employment status of the individuals (employed or not employed), their type of contract (in particular if they are in a permanent contract), and if they are employed by the same or a different firm. Table 1 presents descriptive statistics of the resulting data, of the nearly 50,000 individuals observed in 2011, including these key dependent variables. We find that the conversion rate is 21%, while the employment

7

probability (in 2012) is of 77%. The gap between these figures corresponds to individuals who are not employed or remain under FTC (following the new law) or in a new firm. Only 8% of the total number of workers are observed in a different firm in 2012.

Table 1 presents additional statistics about our sample, including that 73% of individuals were originally hired from February 2008 (and are therefore assumed to be eligible under the new FTC duration law). This results into an average month of hiring of 2.23 (in which 0 corresponds to February 2008). Moreover, our individuals are on average 35.5 years old, 24% and 18% have at most secondary or higher education, and earn an average gross monthly salary of 807 euros. Their firms have average sales of 26 million euros, equity of 6 million euros and employ 225 workers. The most important one-digit sectors are manufacturing, construction and retail, while the most important districts (Lisbon and Porto) represent nearly 50% of the sample.

Given our regression-discontinuity analysis next, we also present graphically the distribution of the observations in our sample across the running variable, the month of hiring. Figure 1 indicates little dispersion in this respect, except for the role of the standard seasonal monthly effects in hirings. In particular, December and August exhibit lower hirings, as they are months of holidays in most sectors, while the following months of January and September exhibit higher hirings. In any case, the blips in these four months, which occurred three years before the introduction of the new law, of course cannot be interpreted as direct manipulation driven by the law.

A second important conclusion from visualising the data in Figure 1 concerns the marked difference in the average conversion percentages before and after the time (three years after) the new law is introduced. In fact, the blue dots to the left of the vertical dashed line (February) are, on average, significantly higher than those to the right. This constitutes 'prima facie' evidence of a significant take up of the new law, opening up the possibility of other effects in terms of employment and mobility. These issues are addressed in greater detail in the next section.

4 Results

Our main analysis of the effects of the increased maximum duration of FTCs is based on a regression discontinuity approach (Hahn et al. 2001, Lee & Lemieux 2010). Essentially we

compare a number of outcomes of interest between a group of workers that is not eligible - because they will necessarily reach the maximum duration of their FTC (three years) before the extended duration is in force - and another group of workers that will be eligible - because they will reach their presumed maximum duration of their FTC once the extended duration is in force.

At the same time, we control for any direct effects from differences across workers driven or related to the time of hiring through different polynomials of our running variable (the month when the individual was hired, centered at February 2009). Given that this timing was determined approximately three years before the introduction of the FTC extension, it will not have had a direct effect upon outcomes. Moreover, we are also not aware of any systematic difference between worker profiles at that threshold, even if that was a time of financial crisis, following the demise of Lehman Brothers. In any case, we conduct a number of robustness checks, including the analysis of a large number of pre-determined covariates that describe workers and their firms at the two sides of the January/February 2008 threshold.

It is important to note that while we know for sure that the first group of individuals could not be subject to the new law, because they will reach the three-year maximum duration before the law is in force, a small number of workers in the second group may have been subject to the maximum number of renewals restriction (until the new law applicable to all FTCs) or the shorter maximum durations (18 and 24 months, applicable to the hiring of the long-term unemployed and the unemployed searching for their first jobs). In the cases of these workers, their FTCs would effectively come to an end in the short time period between November 2011 and January 2012 (but not before as they are still employed in October 2011, by sample construction). Given the limited three-month time window above, we believe that the magnitude of this bias in the estimates presented below will not be large. In any case, to the extent that this issue implies that we are considering as 'treated' individuals that are in fact 'controls', the resulting bias in our estimates will be downward, towards zero. Alternatively, we may approach our estimates as 'Intention to treat' results.

Given the discussion above, we estimate the following regression-discontinuity equation on a cross-section of all workers hired between October 2008 and September 2009 and still employed in FTCs in of October 2011:

$$Y_i = \alpha + \beta D_i + \lambda S(Z_i) + \epsilon_i \qquad (1)$$

9

The key dependent variables considered, Y_i, are dummy variables referring to different potential transitions (conversion to permanent contract, employment status, and mobility to a different firm, in all cases in October 2012). D_i is a dummy variable equal to one for individuals hired from February 2009 (as opposed to between October 2008 and January 2009). $S(Z_i)$ are different polynomials of the running variable, the month of hiring (from October 2008 up to September 2009), centered at February 2009. Standard errors are clustered at the month of hiring level.

Table 2 presents the first set of results, when the dependent variable is the conversion dummy (i.e. one if the worker is under a permanent contract in October 2012). Except for the first column (linear polynomial), all coefficients of interest (β) in the remaining three specifications (quadratic, cubic and linear-spline polynomials) indicate statistically significant negative effects. Moreover, all three coefficients are very similar, at -.048, -.046 and -.045. Compared to the sample mean of 0.21 (Table 1), these coefficients translate into an economically significant counterfactual drop in conversion rates for the individuals affected of over 20%. This result can be interpreted as evidence of considerable take up of the measure and of its relevance in the labour market, especially as it may be seen as a lower bound of the true effect. This take up is also in line with the widespread public discussion about the measure at the time it was prepared and again when it came into force, including amongst employer representatives.[5] This result may also be regarded as a necessary condition for other potential effects to emerge, which we examine below.

First, we consider the case of employment effects - Table 3 - based on a dummy variable equal to one if the worker is employed in 2012 (in the same or a different firm in our data set).[6] As before, we find similar coefficients in the three specifications other than the one based on a linear polynomial but in all cases they are statistically and economically insignificant. In other words, in contrast to the expected effects of the measure, employment does not appear to have increased significantly. Of course, these results may represent lower bounds of the true effects, given that some workers regarded as treated may in fact not be subject to the measure if their contracts reached their maximum duration before the measure was in force.

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[5]Martins (2016) examines the take up of a different measure introduced a little later, in August 2016 - greater flexibility in the setting of overtime premiums -, finding that half of eligible firms did implement the measure at least as soon as three months after it came into force. This result is consistent with the findings of this paper about the demand by firms of greater flexibility in times of recession.

[6]Employment as a civil servant or as an autonomous service provider is excluded and would therefore be classified as non-employment. However, given the regression-discontinuity framework employed, this would not affect our results here.

Second, we consider the case of inter-firm mobility effects - Table 4 - based on a dummy variable equal to one if the worker is employed by a different firm in October 2012 (compared to her employer in October 2011). Here we find a statistically insignificant result with the linear polynomial and the linear-spline but significant results (at the 10% or 5% levels) with the quadratic and cubic splines. Moreover, in those two cases (and also in the case of the linear spline), we find economically meaningful effects, of between approximately 10% and 20% of the average mobility (a sample mean of 0.08 in Table 1).[7]

Taken together with the findings of Table 3, these results indicate that, even if the extension of the maximum duration of the FTCs does not make employment increase significantly in overall terms, inter-firm mobility is reduced. This implies that the workers in our sample that lose their jobs as a consequence of the non-renewal of their FTCs tend to find other jobs relatively quickly, even in the recession period considered. Such high employment levels may reflect a good balance between the experience that these workers gained from their jobs, having been employed consecutively for at least two years, while not being too distant from the external labour market either, as may be the case for workers employed in the same job for longer periods. In any case, such high employment levels for non-renewed workers may not necessarily apply at other levels of the FTC duration, namely workers that hit the legal constraints before the three-year threshold.

However, reducing inter-firm mobility - and therefore worker churning (Burgess et al. 2000, Martins 2008) - must be regarded as a positive outcome in itself, in the sense of a Pareto improvement, to the extent that it reflects a joint decision between the employer and the employee to continue the FTC employment spell that, before the new law was in force, was not legal. In fact, the productivity of such a match is likely to be much greater than its alternatives, creating the necessary conditions for continuing employment in the case of no legal impediments.

These results may be seen to be at odds with the negative views of the labour market segmentation literature regarding FTCs. In fact, this literature (Blanchard & Landier 2002, Bentolila et al. 2012, Charlot et al. 2016) tends to consider FTCs and their greater flexibility - in particular in opposition to measures that erode the high levels of rigidity of permanent contracts in some countries - as a negative development in the architecture of labour markets,

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[7]We also considered an additional potential outcomes, salaries (monthly or hourly), finding no significant effects across the different specifications.

potentially increasing turnover in entry-level jobs. In the case of this flexibility-increasing FTC reform, although conversion rates have fallen, employment spells have become longer and worker turnover has been reduced.

5 Robustness and extensions

In this section we present the findings from three robustness checks and four extensions. Starting with the robustness checks, we first examined the results of our main analysis by specific subgroups. We considered five dimensions available in our data, namely gender, age, schooling, wage and firm size, rerunning our models for women and for the values below the median of the remaining variables (age below 33, schooling below secondary level, hourly wage below four euros, and firm size below 38 workers). The results presented in Tables 5, 6 and 7 are based on the cubic polynomial (but similar to other polynomial specifications, in particular the quadratic one). We find very similar results to those of the full sample, in terms of both economic and statistical significance, despite the smaller sample size. There are perhaps only two exceptions: one is that we do not find significant effects amongst smaller firms (column 5 of Table 5), which may reflect less awareness about the reform; the other concerns the virtually significant positive employment effects amongst younger workers (column 2 of Table 6).

In a second robustness test, we conduct balancing tests, in which we reestimated equation 1 using as dependent variable a number of pre-determined variables. These were: gender, age, hourly pay, secondary and higher education dummies, firm sales, firm size (number of workers), firm equity, firm sector dummies (three main sectors), and firm regions (two main regions). Moreover, to make the test more challenging, we considered only the two polynomial specifications where we found significant results in our main analysis in Section 4 (quadratic and cubic polynomials). We found that, out of the resulting 26 specifications, only three returned coefficients significant at the 5% level (results available upon request). We take these findings as evidence that the threshold at which the measure will be in effect does not coincide with systematic differences in the profiles of the workers involved, further supporting a causal interpretation of our main findings, including the worker mobility effects.

In a third robustness test, we check the extent to which our results are sensitive to the inclusion of control variables. In particular, we include the same set of variables described

above (plus greater detail in terms of sectors and regions) and reestimate equation 1 for the case of conversion effects, considering the same range of polynomials as in the Table 2. The results are presented in Table 8 and indicate very similar effects, ranging between -0.045 and -.048, and in all cases highly significant.

Turning to the extensions, first we implement a falsification test in which we shorten the FTC duration at which the binding restrictions would apply before (but not after) the measure, from three to two years. Although as discussed above some workers would be subject to maximum FTC durations of two years (when a firm launches a new activity of uncertain duration or through the limit of three renewals), in most cases these would not apply unless that threshold happens to coincide with some other feature of the labour market unknown to us.[8] However, the results in Table 9 indicate no significant effect for any specification, a finding that constitutes further support to a causal interpretation of our main estimates.

Our second extension analyses potential firm-level effects of the increased maximum duration of FTCs. Firms that had greater flexibility in the conversion vs non-renewal decision of some of their workers may benefit in terms of different outcomes. For instance, greater flexibility in employment contracts (FTCs in this case) may increase productivity (through incentive effects (Ichino & Riphahn 2005, Martins 2009)), with subsequent positive scale effects in terms of the employment of other individuals too. We consider three variables of potential interest, sales, number of workers and firm exit, all measured in 2012 or in percentage differences between 2012 and 2011, again in the same regression-discontinuity framework of equation 1. However, in no case do we find significant, robust results (available upon request). This is also the case if we restrict the sample to individuals in firms where only one worker was potential affected by the new law, in order to control better for potentially intensity of treatment issues.

Our third extension seeks to measure the effect of the reform in terms of the number of months worked over the period November 2011-October 2012. As we do not know the month when movers leave their previous firm, we assume this to be the month when the contract reached its 36th month or when the new contract started, if earlier. We then consider this duration variable, which ranges between 0 and 12, the latter case when a worker stays in the same firm or when hired by the new firm before or when the 36th month of the previous contract was reached, as our outcome variable in the context of the same regression-

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[8]Incidentally, the entire sample is equally eligible for unemployment benefits, as they are conditional on 12 to 15 months of employment before job loss, a criterion that all workers considered will have met by October 2011.

discontinuity framework of equation 1. We find some evidence (available upon request) of increases in the (log) duration of employment spells, of between 10 to 20%, even if not always significant. This result is consistent with our previous findings of no significant effects upon employment status in 2012 but increased inter-firm mobility. In other words, as workers move less between firms, they also spend less time unemployed in between spells.

Finally, we conduct one additional extension, in which we exploit the availability in our data of information on both FTC and permanent contracts, as well as each worker's firm identity. One possible, even if unlikely, threat to identification may involve differences across sectors and firms in their economic outlook coupled with different seasonal patterns in middle 2012 compared to late 2011 and early 2012. For instance, workers hired earlier in 2008/9 may tend to be in firms that, on average, face more challenging economic circumstances and, therefore, there may also be workers who are more likely to move to other firms upon job loss.

Although the above interpretation of our results may be too extreme and, in any case, largely addressed by a regression discontinuity approach, we test it using a difference-in-differences setup, using data on both FTCs and permanent workers. Our assumption here is that FTCs and permanent workers will be exposed in a similar way, in relative terms, to the business cycle in each firm, so that any resulting differences in the outcomes of interest will be driven by the new FTC law.

Given the above, the difference-in-differences equation we consider is the following:

$$Y_i = \beta_1 FTC_i + \beta_2 D_i + \beta_3 FTC_i * D_i + \beta_4 X_i + \beta_5 F_i + \alpha_i + \epsilon_i \qquad (2)$$

The dependent variable considered, Y_i, is a dummy variable referring to conversion (or, more generally, permanent employment status) in 2012, or mobility to a different firm, always comparing 2011 and 2012 (October in both cases); D_i is a dummy variable equal to one for individuals hired from February 2008; and FTC_i is a dummy variable equal to one for individuals under a FTC in October 2011. Depending on the specification, we also consider worker controls (X_i), firm controls (F_i), and firm fixed effects (α_i). To increase the comparability of the two groups of workers, given the lack of a running variable in this difference-in-differences model, we restrict the analysis to the hiring period November 2008 to April 2009.

Table 10 presents the results regarding conversion effects, where we again find evidence of considerable take-up. The interaction coefficients range between -.029 and -.051, the latter

in the case of the specification including firm fixed effects. Moreover, we also find supporting evidence of negative effects on worker mobility - Table 11. In particular, the coefficients of the interaction variable are always significantly negative, ranging between -.013 and -.02. If anything, the inclusion of firm fixed effects (i.e. potentially comparing workers hired at similar times by the same firms but in either FTCs or permanent contracts in October 2011) increases the magnitude of the coefficients (in absolute terms). Moreover, the four estimates are particularly similar to the two significant coefficients presented in Table 4, -.013 and -.015. It is also interesting to note that, as expected, the coefficients on FTCs are statistically and economically significantly negative, while the coefficients on later hiring are very small and either positive or negative.

These difference-in-differences results are robust to small changes in the range of the window adopted, in the main case November 2008 to April 2009. Moreover, as in the regression-discontinuity approach, we do not find economically significant effects when considering effects in terms of employment in the difference-in-differences approach, despite positive coefficients (results available upon request).

6 Conclusions

Policy makers and academics put great effort in understanding and minimising the negative employment effects of business cycles. This paper evaluates one measure in this regard, namely greater flexibility in the maximum duration of fixed term contracts during recessions. The simple rationale of the measure is that, when faced with an uncertain outlook (and restrictive permanent contracts), firms may be more likely to dismiss FTCs if the only legal alternative is to convert them. By allowing more time in recessions until this 'in or out' decision, a policy maker may obtain gains in terms of greater employment or reduced turnover.

Our empirical evidence is based on the evaluation of the effects of a new law introduced in Portugal, in the midst of a recent recession, which increased the maximum duration of FTCs from three years to four and a half years. Our analysis is based on regression-discontinuity (and difference-in-differences) methods, applied to matched employer-employee panel data, covering a large subset of the workers eligible.

We find a considerable take up of this measure, as conversions to permanent contracts drop by 20%. However, we do not detect significant short-term effects on overall employ-

15

ment, possibly because data limitations lead to some attenuation bias and prevent us from considering the lower-tenure subset of workers for whom this employment margin would be most sensitive. On the other hand, and despite the data issues above, we find that worker churning is reduced significantly, as mobility of eligible fixed-term workers to other firms drops by 10%. The two results can be reconciled through good employment opportunities in other firms for non-eligible workers in our sample but also would imply a negative effect in terms of unemployment spells in between jobs.

In conclusion, we find that longer, more flexible FTCs can promote jobs, in terms of less worker mobility and longer matches, at least in recessions. Our findings highlight the potential of greater flexibility in the legal parameters of FTCs - and possibly other labour market regulations and institutions (not only unemployment benefits but possibly also tax wedges, activation practices, minimum wages, etc) - over the business cycle as a tool to minimise the resulting employment fluctuations. Such rules in labour market policy making could successfully complement those in place in macroeconomics (Taylor 1993), especially given the challenges that many countries currently face in their monetary and fiscal policies.

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Figure 1: Number of workers and conversion rates per hiring month
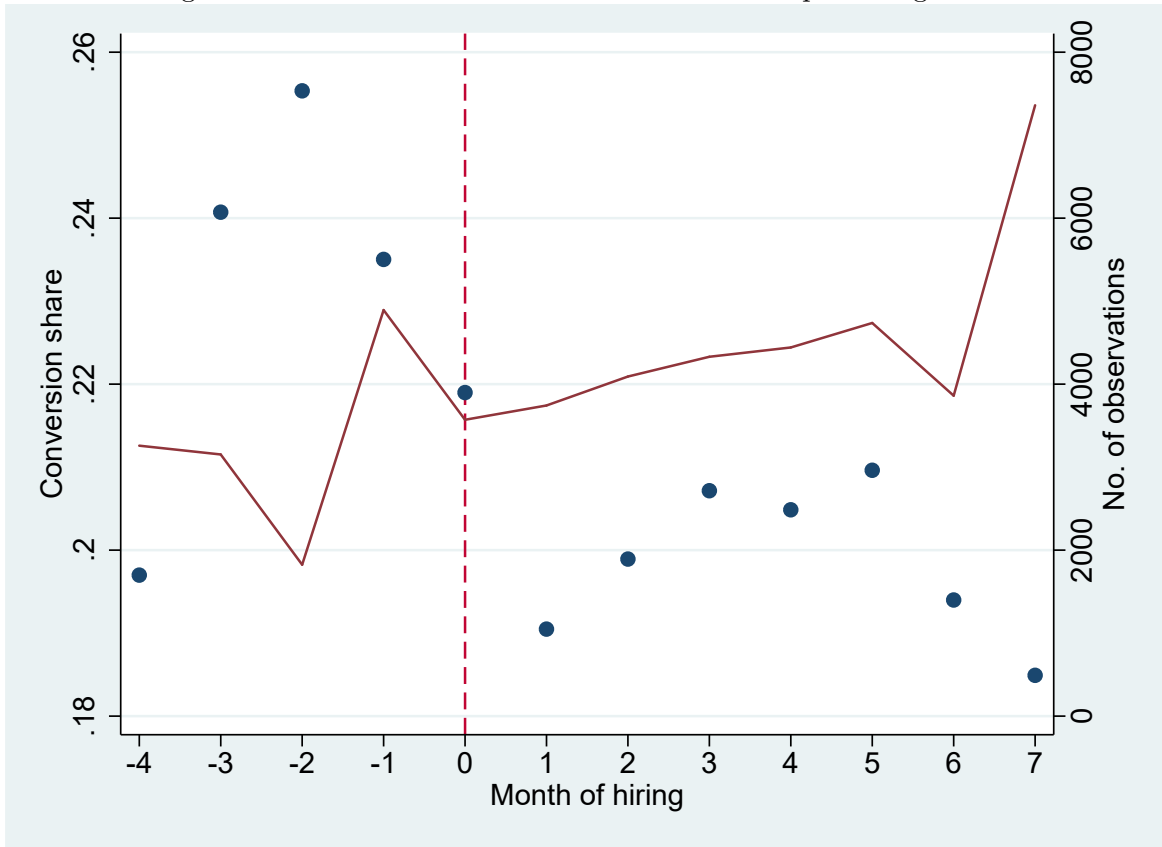
Notes: The red line indicates the number of hirings per month (measuring along the right-hand-side vertical axis); the blue dots indicate the mean conversion rates per month (measured along the left-hand-side vertical axis). Month 0 refers to February 2009. These will be the first group of individuals subject to the longer maximum duration of FTC, introduced in mid-January 2012, should their contracts last the until them maximum duration of three years. All 49,266 individuals in the sample (described in more detail in Table 1) are still employed in the same firms as of October 2011.

Table 1: Descriptive statistics

	Mean	SD
Conversion	0.21	0.41
Employment	0.77	0.42
Firm mobility	0.08	0.27
Longer FTC maximum duration in force	0.73	0.44
Month of hiring (centered)	2.23	3.48
Female	0.46	0.50
Age	35.50	10.17
Secondary education	0.24	0.43
Higher education	0.18	0.38
Monthly wage	807.49	2126.93
Sales	26127.65	114089.66
Firm size (workers)	225.41	616.65
Equity	6104.56	78487.65
Manufacturing	0.17	0.38
Construction	0.14	0.34
Retail	0.16	0.37
Lisbon	0.33	0.47
Porto	0.16	0.37
Observations	49266	

Notes: 'Conversion' is a dummy variable (dv) equal to one if the worker is employed under a permanent contract in (October) 2012. 'Employment' is a dv equal to one if the worker is employed in (October) 2012. 'Firm mobility' is a dv equal to one if the worker is employed in a different firm in (October) 2012. 'Longer FTC max duration' in force is a dv equal to one taking value one for individuals hired from February 2008 onwards. 'Month of hiring (centered)' is a variable centered at February 2008 (ie -1 for individuals hired in January 2008, 1 for individuals hired in March 2008, etc). 'Female' is a dv equal to one for women. 'Age' indicates the worker's age in 2011. 'Secondary' and 'Higher education' are dv's indicating a worker's highest schooling attainment. 'Monthly wage' indicates the worker's monthly salary in October 2011 (in nominal euros). The remaining variables refer to firm characteristics (of the firm where the worker is employed, in 2011): sales (in thousands of euros), number of workers, equity (in thousands of euros), sectors (manufacturing, construction and retail) and region (Lisbon and Porto). The sample is all individuals employed under fixed term contracts in October 2011 and hired in their current employment spell between October 2008 and September 2009. Own calculations based on the 'Quadros de Pessoal' data set.

Table 2: Conversion effects

	(1)	(2)	(3)	(4)
Longer FTC max duration in force	-.021	-.048	-.046	-.045
	(.013)	(.018)***	(.018)**	(.016)***
Month of hiring (centered)	-.001	.005	.004	.011
	(.002)	(.003)	(.004)	(.006)*
Month of hiring (centered)^2		-.001	-.001	
		(.0004)***	(.0006)**	
Month of hiring (centered)^3			.00005	
			(.0001)	
Month of hiring (cent.)*Longer FTC max dur.				-.013
				(.006)**
Const.	.226	.249	.249	.255
	(.010)***	(.011)***	(.011)***	(.014)***
Obs.	49266	49266	49266	49266
R^2	.001	.002	.002	.002

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The dependent variable is a dummy variable equal to one if the individual is converted to a permanent contract in (October) 2012. The running variable (month of hiring) is centered at February 2008, when it takes value zero. The key regressor (Longer FTC max duration in force) is a dummy variable taking value one for individuals hired from February 2008 onwards and value zero otherwise. The sample is all individuals employed under fixed term contracts in October 2011 and hired in their current employment spell between October 2008 and September 2009. Own calculations based on the 'Quadros de Pessoal' data set. Standard errors clustered at the month of hiring level. Significance levels (two-sided tests): * 0.10, ** 0.05, *** 0.01.

Table 3: Employment effects

	(1)	(2)	(3)	(4)
Longer FTC max duration in force	-.002	.006	.006	.003
	(.008)	(.012)	(.012)	(.013)
Month of hiring (centered)	-.0003	-.002	-.002	-.003
	(.001)	(.002)	(.003)	(.004)
Month of hiring (centered)^2		.0003	.0003	
		(.0003)	(.0005)	
Month of hiring (centered)^3			-2.96e-06	
			(.00009)	
Month of hiring (cent.)*Longer FTC max dur.				.003
				(.005)
Const.	.775	.768	.768	.768
	(.006)***	(.010)***	(.010)***	(.012)***
Obs.	49266	49266	49266	49266
R^2	.00002	.00006	.00006	.00004

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The dependent variable is a dummy variable equal to one if the individual is employed in (October) 2012. See more details in notes to Table 2.

Table 4: Firm mobility effects

	(1)	(2)	(3)	(4)
Longer FTC max duration in force	.001	-.013	-.015	-.007
	(.007)	(.008)*	(.007)**	(.007)
Month of hiring (centered)	-.0009	.002	.004	.003
	(.001)	(.001)*	(.002)**	(.003)
Month of hiring (centered)^2		-.0005	-.0003	
		(.0002)***	(.0003)	
Month of hiring (centered)^3			-.00005	
			(.00005)	
Month of hiring (cent.)*Longer FTC max dur.				-.004
				(.003)
Const.	.079	.091	.090	.089
	(.004)***	(.006)***	(.005)***	(.005)***
Obs.	49266	49266	49266	49266
R^2	.0001	.0004	.0004	.0002

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The dependent variable is a dummy variable equal to one if the individual is employed by a different firm in (October) 2012 (compared to 2011). See more details in notes to Table 2.

Table 5: Conversion effects - different subgroups

	(1) Women	(2) Young	(3) Low schooling	(4) Low wage	(5) Small firms
Longer FTC max dur in force	-.041	-.049	-.043	-.037	.006
	(.017)**	(.022)**	(.013)***	(.011)***	(.008)
Month of hiring (c)	.009	.002	.005	.002	-.002
	(.003)***	(.005)	(.002)**	(.002)	(.002)
Month of hiring (c)^2	-.0006	-.002	-.0007	-.0008	-.0005
	(.0007)	(.0007)***	(.0004)	(.0003)***	(.0002)**
Month of hiring (c)^3	-.0001	.0002	-8.52e-06	.00007	.0001
	(.0001)	(.0001)	(.00006)	(.00006)	(.00005)**
Const.	.238	.278	.218	.212	.149
	(.014)***	(.012)***	(.008)***	(.004)***	(.003)***
Obs.	22899	24651	28704	23754	24772
R^2	.0007	.003	.0008	.0007	.00008

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The dependent variable is a dummy variable equal to one if the individual is converted to a permanent contract in (October) 2012. The running variable (month of hiring) is centered at February 2008, when it takes value zero. The key regressor (Longer FTC max duration in force) is a dummy variable taking value one for individuals hired from February 2008 onwards and value zero otherwise. The sample is a subset of all individuals employed under fixed term contracts in October 2011 and hired in their current employment spell between October 2008 and September 2009. Own calculations based on the 'Quadros de Pessoal' data set. The subset varies depending on the column. In the first column: only women. In the second column: only workers aged 33 or below. In the third column: only workers with less than secondary schooling. In the fourth column: only workers earning less than four euros per hour. In the fifth column: only workers in firms with 38 workers or fewer. Standard errors clustered at the month of hiring level. Significance levels (two-sided tests): * 0.10, ** 0.05, *** 0.01.

Table 6: Employment effects - different subgroups

	(1) Women	(2) Young	(3) Low schooling	(4) Low wage	(5) Small firms
Longer FTC max dur in force	.006	.021	.006	.013	.002
	(.022)	(.014)	(.017)	(.018)	(.012)
Month of hiring (c)	-.006	-.007	-.003	-.007	-.003
	(.003)*	(.003)**	(.004)	(.004)	(.004)
Month of hiring $(c)^2$	-.0004	.0001	.0007	.0003	-.0002
	(.0008)	(.0005)	(.0007)	(.0006)	(.0005)
Month of hiring $(c)^3$	.0001	.00009	-1.00e-05	.00009	.00007
	(.00009)	(.0001)	(.0001)	(.0001)	(.0001)
Const.	.787	.775	.752	.758	.751
	(.020)***	(.012)***	(.014)***	(.012)***	(.010)***
Obs.	22899	24651	28704	23754	24772
R^2	.0005	.0003	.0002	.0004	.0002

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The dependent variable is a dummy variable equal to one if the individual is employed in (October) 2012. See more details in notes to Table 5.

Table 7: Firm mobility effects - different subgroups

	(1) Women	(2) Young	(3) Low schooling	(4) Low wage	(5) Small firms
Longer FTC max dur in force	-.015	-.011	-.018	-.008	.005
	(.007)**	(.010)	(.010)*	(.015)	(.006)
Month of hiring (c)	.005	.002	.003	.002	.001
	(.001)***	(.002)	(.003)	(.002)	(.001)
Month of hiring $(c)^2$	-.0001	.0002	-.0004	.0002	1.00e-05
	(.0002)	(.0004)	(.0003)	(.0006)	(.0002)
Month of hiring $(c)^3$	-.00008	-.0001	-5.68e-06	-.00008	-.00003
	(.00003)**	(.00006)*	(.00007)	(.00007)	(.00004)
Const.	.076	.094	.089	.077	.066
	(.004)***	(.007)***	(.006)***	(.012)***	(.003)***
Obs.	22899	24651	28704	23754	24772
R^2	.0003	.0007	.0002	.0001	.0003

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The dependent variable is a dummy variable equal to one if the individual is employed by a different firm in (October) 2012 (compared to 2011). See more details in notes to Table 5.

Table 8: Conversion effects - including control variables

	(1)	(2)	(3)	(4)
Longer FTC max duration in force	-.016	-.042	-.039	-.041
	(.012)	(.016)***	(.017)**	(.013)***
Month of hiring (centered)	-.003	.004	.002	.010
	(.002)	(.003)	(.004)	(.005)**
Month of hiring (centered)^2		-.001	-.001	
		(.0003)***	(.0005)**	
Month of hiring (centered)^3			.00007	
			(.00009)	
Month of hiring (cent.)*Longer FTC max dur.				-.014
				(.005)***
Const.	.299	.321	.321	.328
	(387.314)	(539.562)	(144.878)	(99.937)
Obs.	47742	47742	47742	47742
R^2	.031	.032	.032	.032

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The dependent variable is a dummy variable equal to one if the individual is converted to a permanent contract in (October) 2012. All specifications include the following control variables: female indicator, age, secondary and higher education indicators, hourly wage, log firm sales, log firm size (number of workers), multi-establishment dv and foreign and public ownership dv's, industry and region dummy variables (firm-level information refers to firm affiliation in 2011). See more details in notes to Table 2.

Table 9: Conversion effects - falsification exercise

	(1)	(2)	(3)	(4)
Longer FTC max duration in force	.032	-.022	-.026	-.003
	(.023)	(.021)	(.022)	(.023)
Month of hiring (centered)	.001	.015	.017	.020
	(.003)	(.006)***	(.006)***	(.012)
Month of hiring (centered)^2		-.002	-.002	
		(.0007)***	(.001)	
Month of hiring (centered)^3			-.0001	
			(.0002)	
Month of hiring (cent.)*Longer FTC max dur.				-.020
				(.013)
Const.	.324	.370	.369	.366
	(.019)***	(.017)***	(.017)***	(.020)***
Obs.	39740	39740	39740	39740
R^2	.001	.003	.003	.002

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The dependent variable is a dummy variable equal to one if the individual is converted to a permanent contract in 2012. The running variable (month of hiring) is centered at February 2009, when it takes value zero. The key regressor (Longer FTC max duration in force) is a dummy variable taking value one from February 2009 onwards and value zero otherwise. The sample is all individuals employed under fixed term contracts in October 2011 and hired in their current employment spell between October 2009 and September 2010 (not October 2008 and September 2009, as in previous tables) - the large majority of these individuals would not be subject to the extended maximum duration of fixed-term contracts. Own calculations based on the 'Quadros de Pessoal' data set. Significance levels (two-sided tests): * 0.10, ** 0.05, *** 0.01.

Table 10: Conversion effects - difference-in-differences

	(1)	(2)	(3)	(4)
FTC	-.558	-.559	-.555	-.485
	(.005)***	(.005)***	(.005)***	(.011)***
Longer FTC max duration in force	-.005	-.006	-.006	-.003
	(.003)*	(.003)*	(.003)*	(.005)
FTC*Longer FTC max dur	-.033	-.031	-.029	-.051
	(.007)***	(.007)***	(.007)***	(.011)***
Worker controls		X	X	X
Firm controls			X	X
Firm fixed effects				X
Obs.	84201	81697	81515	81515
R^2	.276	.287	.293	.761

Notes: The columns present different specifications of a difference-in-differences model. The dependent variable is a dummy variable equal to one if the individual is in a permanent job in (October) 2012. 'FTC' is a dv equal to one for workers under fixed-term contracts in 2011, 'Longer FTC max duration in force' is a dv equal to one for workers hired from February 2008, and 'FTC*Longer FTC max dur' is the interaction (DID) effect of interest. The sample considered includes workers hired between November 2008 and April 2009. Worker controls are a gender dv, age in 2011, hourly total earnings and two schooling dv. Firm controls are sales, equity, number of workers, multi-establishment dv and foreign and public ownership dv's. Significance levels (two-sided tests): * 0.10, ** 0.05, *** 0.01.

Table 11: Firm mobility effects - difference-in-differences

	(1)	(2)	(3)	(4)
FTC	.028	.029	.028	.038
	(.003)***	(.003)***	(.003)***	(.006)***
Longer FTC max duration in force	.004	.004	.003	-.004
	(.002)**	(.002)*	(.002)*	(.003)
FTC*Longer FTC max dur	-.014	-.013	-.012	-.014
	(.004)***	(.004)***	(.004)***	(.007)*
Worker controls		X	X	X
Firm controls			X	X
Firm fixed effects				X
Obs.	84201	81697	81515	81515
R^2	.002	.003	.005	.612

Notes: The columns present different specifications of a difference-in-differences model. The dependent variable is a dummy variable equal to one if the individual is in the same firm in (October) 2012, compared to (October) 2011. See more details in notes to Table 10.