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IN THE FAST LANE: THE OPERATION
OF FIXED-TERM CONTRACTS**

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Matching Workers to Jobs in the Fast Lane: The Operation of Fixed-term Contracts *

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Abstract

In this paper we look at fixed-term contracts and examine the main features of temporary as opposed to regular employment, keeping the focus on employment careers and wage dynamics of workers employed under fixed-term contracts. Previous work found that fixed-term contracts serve as screening devices for employers. Here it is found that fixed-term contracts serve as search devices for workers, as well. Hence, they can be considered stepping-stones to permanent forms of employment. However, if due to a job loss episode, a worker receives at some evolved stage of his or her career a fixed-term contract, there is an indication that both his wage and subsequent employment prospects are severely harmed.

KEYWORDS: Fixed-term Contracts, Worker Flows, Wages

JEL CODES: J21, J23.

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1 Introduction

Typically, fixed-term contracts give employers the opportunity to layoff workers at lower cost and with fewer restrictions than is the case for regular workers. These two features are expected to make fixed-term contracts a useful option for employers, particularly in labor markets where the costs of terminating a permanent contract are high.

As such, fixed-term contracts become a component of labor market flexibility, one that seems particularly appropriate to adjust the level of the workforce to fluctuations of labor supply and demand, expected or not. Consistently, many European governments have tried to reform the labor market, leaving existing contracts unchanged but reducing (or eliminating) firing restrictions on new contracts.

The focus on the flexibility role of fixed-term contracts has fueled a debate about the quality of jobs and the opportunities for career advancement offered to temporary workers. The concern is that workers with fixed-term contracts are used as buffer stocks, insulating permanent workers from fluctuations in labor demand. Should this be the case, temporary jobs should be expected to result in job loss, workers should suffer from poor job security and receive little training, which would further harm their prospects of subsequently finding a better job.

Another consequence of using fixed-term contracts to avoid higher prospective firing costs is that employment adjustment to shocks should be speeded up. However, in a study of the speed of employment adjustment in German manufacturing over a period of 15 years, Hunt (2000) found no evidence that the 1985 law aimed at facilitating the use of fixed-term contracts resulted in faster adjustment. Restrictions on rolling over fixed-term contracts were identified as one of the reasons behind this puzzling result.

The fact that fixed-term contracts cannot live forever and must be, at some point, either made permanent or terminated, severely reduces the usefulness of their availability as an instrument of flexibility. Restrictive roll-over clauses may, however, create an extra reason to use fixed-term contracts. Churning, i.e., match replacement at continuing positions, may be the employers optimal response to the prohibition of contract roll-over, although being an unintended result of those

restrictions (Varejão, 2000, Blanchard and Landier, 2001). If, at the end of a given duration, the employer decides to keep a temporary worker, his contract becomes permanent and subject to regular firing costs. To avoid this consequence, the employer has an incentive to destroy this (otherwise) good match and hire a replacement match of an uncertain value. The result is unproductive churning. If such use of fixed-term contracts dominates, workers, especially those entering the labor market, will have to go through a succession of low productivity temporary jobs and many spells of unemployment, before obtaining a regular job.

However, fixed-term contracts may also serve in a third role. In high firing cost settings, investments in pre-hiring screening are the employers optimal response to the costs of having bad regular matches terminated. The availability of low firing cost contracts changes the preferred mix of pre-hiring and on-the-job screening, increasing the demand for the latter. With fixed-term contracts, employers have the incentive to hire workers for a trial period, observe them on the job, gaining information about the true value of the match, and only then make the decision about keeping him on or laying him off, holding the option of a low-cost dismissal throughout.

If fixed-term contracts are used as screening devices, for workers they act as stepping-stones to regular positions. By definition, not all newly formed matches will survive and become regular matches. Some will not meet the employers reservation match value and will end up as layoffs followed by replacement hirings. Others will not offer the workers utility reservation level and will end up as quits. Others, still, will be successful matches and will result in the fixed-term contract being converted into a regular contract. As a result, the productivity value of the surviving matches is enhanced and employment relationships are more stable, both facts fostering investments in human capital and productivity growth.

The consequences of fixed-term contracts in terms of the employment and wage dynamics of workers, as well as the corresponding policy implications, are closely related to the objectives of the employers staffing policies. In a companion paper (Varejão and Portugal, 2002), we found evidence of fixed-term contracts being used in the Portuguese labor market mostly for the purpose of screening workers for regular positions.¹ In this paper, we look at the workers side and, after establishing

¹Results supporting the importance of screening as a motivation for the use of fixed-term contracts were also obtained by Adam and Canziani (1998), Booth et al. (2000), and Guell-Rotlan and Petrongolo (2000).

the profile of the typical temporary worker, we examine the impact of fixed-term contracts on wage profiles of temporary and regular workers, and at patterns of transitions across labor market states.

The paper is organized as follows. Section 2 describes the institutional framework. In Section 3 the dataset used in empirical work is described. Section 4 describes the most salient features of fixed-term employment in Portugal, while Section 5 compares wages of temporary and regular workers, and Section 6 looks at transitions across labor market states. Section 7 concludes.

2 Institutional framework

Rules governing the termination of permanent contracts in Portugal are widely perceived as very restrictive, placing the country high in all international rankings of labor market rigidities (e.g., OECD, 1999). Fixed-term contracts, which were first regulated in 1976, were conceived as an instrument of flexibilization at the margin. The mushrooming of these contracts eventually led to major changes in the legal framework governing both regular (permanent) and fixed-term contracts in 1989, when most rules currently in force were established.

As a result, fixed-term contracts are permitted for objective reasons (replacement of temporarily absent permanent workers, exceptional workload, seasonal work, and specific projects). They are also permitted for business start-ups, the launching of new activities of uncertain duration, and recruiting long-term unemployed workers and first-time job seekers.

Fixed-term contracts have a minimum duration of six months unless they are justified on objective grounds, in which case no minimum applies. Their maximum duration is set at three years (two in the cases of business start-ups and the launching of new activities). Three successive renewals is the maximum permitted.

The contract expires only if the employer notifies the worker eight days in advance that he does not intend to renew it; otherwise it is automatically renewed. If the maximum duration of the contract is exceeded, the contract automatically becomes permanent.

When the end of a temporary contract is reached and the worker is not offered a regular position, he or she becomes entitled to a terminal bonus equal to two days pay for each complete month of service.

If the employer terminates the contract before its term, and the termination is unlawful, the worker is entitled to compensation equal to the pay loss from dismissal to the date of the court's decision or the term of the contract (whichever occurs first). He or she is also entitled to reinstatement if the term of the contract has not yet been reached.

If, during the period of the contract a vacancy for a permanent position opens at the firm, employees with fixed-term contracts at that moment who may qualify for the job are given priority over other applicants.

Contracts surviving for 12 months that are terminated for reasons not attributable to the worker cannot be replaced within a period of three months.

Hence, fixed-term contracts offer Portuguese employers the opportunity of hiring new workers on a much less stringent basis than regular contracts. However, fixed-term contracts are also subject to a number of restrictions that may limit their practical usefulness. As mentioned above, clauses prohibiting the roll-over of contracts may give rise to unproductive churning, but the prohibition of replacement of temporary workers that stay with the firm for one year actually makes churning a less interesting option.

3 Data

The Household Employment Survey is a quarterly employment survey run by the *Instituto Nacional de Estatística*, (INE). In every quarter it randomly surveys approximately 40,000 individuals. One sixth of the sample is rotated out every quarter. Seven spells of the survey, from the first quarter of 1998 to the third of 2000, were available to this study, covering 56,140 individuals.

Individual identification numbers permit the tracking of individuals over consecutive spells of the survey (5/6 from quarter to quarter). This makes computation of quarterly transition rates across labor market states (employment, unemployment, and not in the labor force) possible. Because information on the type of contract held by the employed is available, it is possible to compare the pattern of transitions for workers on fixed-term and open-ended contracts. The survey also contains detailed information on the individuals demographic characteristics, his or her labor market background, current job characteristics, current wage, and job-search efforts. This allows for a full characterization of the temporary work-

force and extensive control for other relevant job and workers' characteristics in regression analysis.

4 Basic Facts about FTC

Between 1991 and 1998, fixed-term contracts represented an average of 14 percent of total employment (Figure 1 - A), but an average of 62 percent of all accessions and 43 percent of all separations (Figure 1, panels C and D).

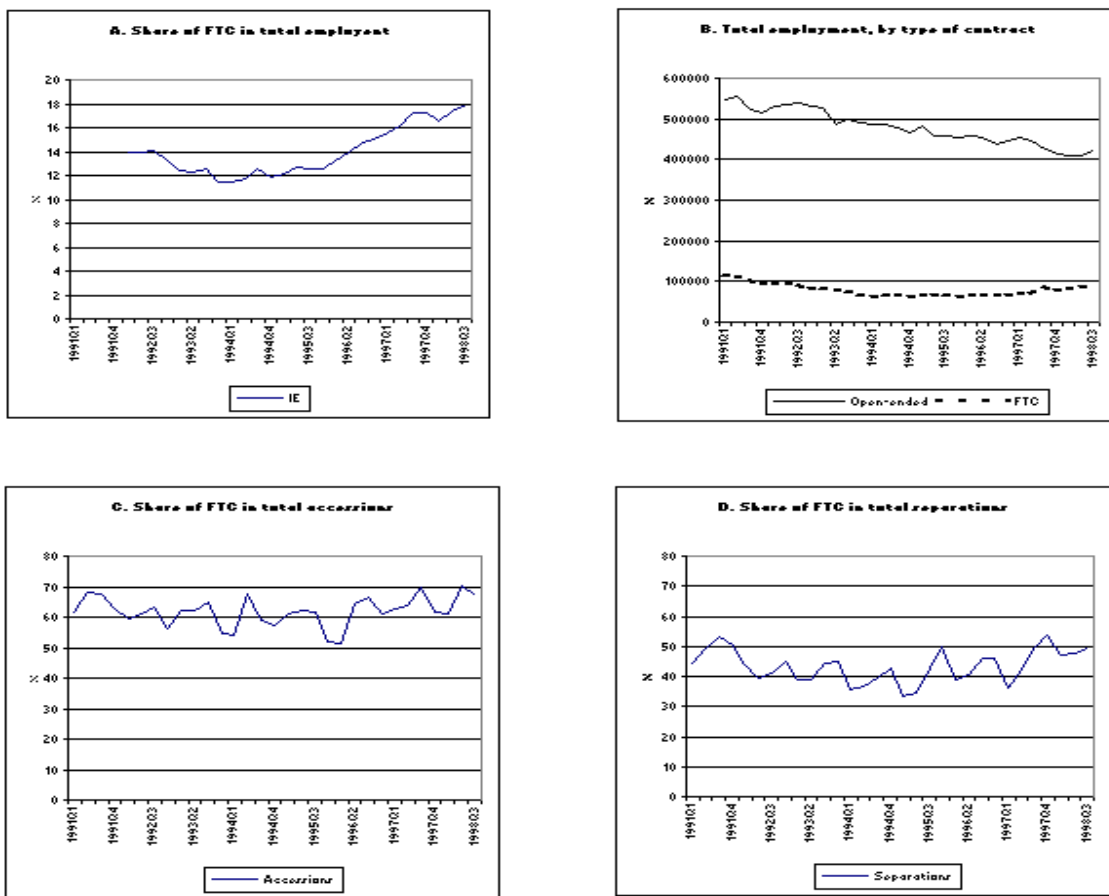


Figure 1: PROPORTION OF FIXED-TERM CONTRACTS ON TOTAL EMPLOYMENT AND WORKER FLOWS.

That the importance of fixed-term contracts is under-evaluated by point-in-time stock counts is confirmed by comparing the number of workers with a fixed-term contract at the end of each calendar year with the number of those that, at any point within the year, were employed with those contracts. For firms with at least

100 employees, point-in-time measures capture only 54 percent of the total number of individuals with fixed-term contracts at any point within the period (source: Social Audit).²

Across plants there is an enormous diversity in the intensity of use of temporary workers in total employment. The distribution of the share of temporary employment has a large mass point at zero that represents 75 percent of all establishments. However, for the remaining 25 percent, the intensity of use of temporary workers spans the entire range. Nearly 2 percent of the establishments, presumably newly created establishments, employ temporary workers only. Excluding units that do not employ temporary workers, the mode of the distribution occurs in the interval corresponding to 15 to 20 percent of total employment (source: Establishment Employment Survey, establishments of all sizes, in all sectors considered).

The incidence of fixed-term contracts varies dramatically across occupational categories. Temporary contracts account for only 4 percent of total employment of Managers, but this share varies inversely with the skill-level, reaching 68 percent for apprentices at the lower-end of the scale.³ This pattern of variation of the incidence of fixed-term contracts across skill-levels indicates that firms use staffing policies that differ enormously across occupational categories. At the top of the occupational scale, workers are either recruited as permanent or they are offered an open-ended contract after a short trial period. For lower skill levels, individuals are predominantly hired under fixed-term contracts, which, on average, have longer duration.

Workers with fixed-term contracts are predominantly women (54.1 percent of total employment with fixed-term contracts) and are younger and better educated than workers with open-ended contracts (Table 1). The average age of workers with fixed-term contracts is 30.5 years (38.8 for permanent workers) and their average number of years of education is 8.2 (7.2 for permanent workers). The higher educational attainment of temporary workers is not independent of the fact that they are younger, because the nine years mandatory schooling is still recent

²A similar result was also obtained for the U.S. labor market (Houseman, 2001). There is, however, a difference of degree. Where Houseman reports a five-to-one relationship between the point-in-time and accumulated stock counts of short-term hirings for the U.S., here a two-to-one relationship was obtained. Even though the two contractual arrangements are not strictly comparable, this suggests a longer average duration of temporary contracts in Portugal (about six months).

³All these figures are from the Social Audit and refer to firms with at least 100 employees. In this dataset, fixed-term contracts represent 17.2 percent of total employment (which exceeds the 14 percent average in Figure 1).

in Portugal.

	Fixed-term contract	Open-ended contract	All
By Gender			
Male	45.9	54.7	53.6
Female	54.1	45.3	46.4
By Age Group			
16-20	14.8	4.3	5.6
21-35	57.2	36.7	39.4
36-55	25.5	50.3	47.1
>55	2.5	8.7	7.9
By School Level			
<4 years	3.7	5.2	5.1
4 years	49.4	59.0	57.7
9 years	21.1	14.6	15.4
12 years	15.4	11.8	12.3
Technical School	2.4	3.3	3.2
College	8.0	6.1	6.3

Table 1: STRUCTURE OF TOTAL EMPLOYMENT, BY TYPE OF CONTRACT AND INDIVIDUAL ATTRIBUTES (PERCENTAGE).

5 Wage Profiles

Raw differences between monthly wages of temporary and permanent workers indicate that fixed-term contracts are clearly associated with lower pay - the average hourly wage of employees with fixed-term contracts is 82.6 percent of the corresponding measure for employees with open-ended contracts.

To fully control for the individual observed characteristics of both the worker and the employer, Mincerian-type wage equations for workers on fixed-term and

open-ended contracts were estimated. The set of regressors includes human capital variables (age, schooling and vocational training), two dummies indicating if the worker is in his first job and if he is on a part-time job, and controls for the type of employer (public administration, state-owned company and other). A dummy variable indicating the type of contract the individual has (fixed-term or open-ended) is added, multiplied by the age variable (49*2 coefficients, corresponding to ages between 16 and 64 and the two contract types). The dependent variable is the log of the monthly wage. For our purpose it is essential to compare the wages received by workers with temporary and permanent contracts at different points of their working lives. To do that we represent in figure 2 the estimated log of the monthly wage corresponding to each type of contract-age pair. Two third-degree polynomial regression curves were added to the figure.

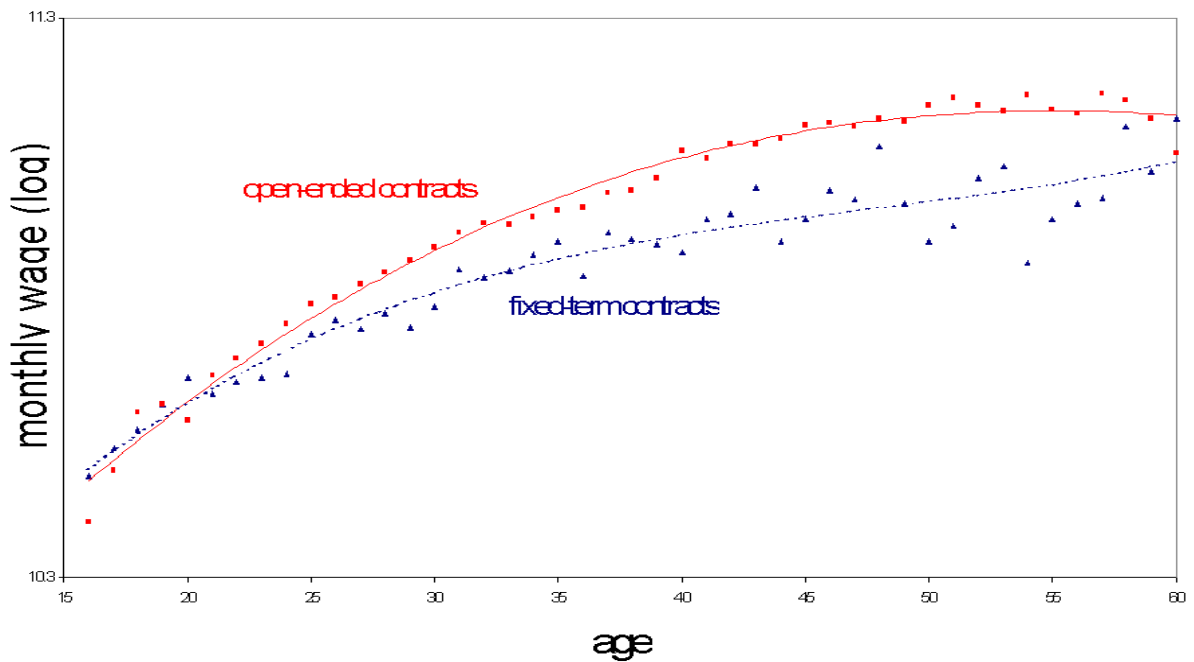


Figure 2: AGE-EARNINGS PROFILE, BY TYPE OF CONTRACT.

The figure shows that both curves have the usual shape. Workers in the early years of their careers receive similar pay, independently of the type of contract they have. If anything, workers with fixed-term contracts receive slightly higher wages than similar workers with open-ended contracts, which could indicate the

presence of a compensating differential for reduced job security associated with temporary contracts. However, the situation is completely reversed as we look at older workers - at the age of 30, the penalty is about 10 percent the wage received by a permanent worker. The gap grows wider with the workers age, reaching 20 percent for workers aged 50.

6 Worker Flows

6.1 Empirical Transition Rates

If firms use fixed-term contracts predominantly for screening, for workers these contracts are stepping-stones to a permanent form of employment. At the same time, if fixed-term contracts are used for churning or to deal with workload fluctuations they are a transitory form of employment with poor prospects of career advancement.

Employment by fixed-term contract is a transient state by design. Several destination states are admissible. Here we consider transitions out of temporary employment into unemployment, inactivity and other job, as well as transitions from temporary to permanent positions with the same employer. As a benchmark, the corresponding transition rates originating in regular employment were also computed. Results are in Table 2.⁴

	To Unemployment	To Inactivity	To Another Job	To an OEC	To an FTC
From OEC (1)	0.36	0.78	0.75		0.32
From FTC (2)	3.21	3.08	3.36	5.05	
(2)/(1)	8.9	3.9	4.5		

Table 2: QUARTERLY TRANSITION RATES FROM EMPLOYMENT, BY TYPE OF CONTRACT (PERCENTAGE).

Transitions out of employment are less frequent in Portugal than in other countries.⁵ However, because of the very nature of those contracts, we expect that workers with fixed-term contracts change their status more frequently, which is

⁴Spanning from the first quarter of 1998 to the third quarter of 2000, the sample period covers an upturn only. This could, of course, influence the results reported here. However, a comparison with similar evidence for the 1992-1997 period (Portugal, 2000), is reassuring. Except for transitions to unemployment, which are, as expected, higher (0.61 and 4.70 for open-ended contracts and fixed-term contracts), the magnitude of transition rates is remarkably similar for the two periods. More important, for all types of transitions, the differential between the two types of contract is about the same in the two periods.

⁵Blanchard and Portugal (2001) estimate that the magnitude of worker flows out of employment for Portugal is about one fourth of the corresponding figure for the United States.

exactly what we see in Table 2. Workers with fixed-term contracts are about five times as likely to lose their jobs, and nine times as likely to become unemployed as are workers on open-ended contracts. This is, of course, what one could expect whatever the reasons firms use fixed-term contracts. The second point is that about 5.1 percent of all workers on a fixed-term contract are likely to be given an open-ended contract every quarter. This is suggestive of the importance of screening as a motivation for offering fixed-term contracts to newly admitted workers.

6.2 Estimation Procedure

Duration analysis provides a convenient statistical framework to study worker flows. The estimation of the hazard function, as applied to the context of job duration, starts with the definition of the duration variable (t) that measures the workers' tenure in the job. All workers are observed over a fixed time interval of one quarter.

A useful concept in statistical analysis of a duration phenomenon is the *hazard function*. In the study of job duration, the hazard function gives the instantaneous probability moving out of a job (or ending a fixed-term contract) at t , given that he stayed in the job (or with a fixed-term contract) until t

$$h(t) = \lim_{\Delta t \rightarrow 0} \frac{(P(t \leq T < t + \Delta t \mid T \geq t))}{\Delta t} = \frac{f(t)}{1 - F(t)} = \frac{f(t)}{S(t)}. \quad (1)$$

where $f(t)$ is the probability density function, $F(t)$ is the distribution function, $S(t)$ is the survival function. A useful function is the integrated hazard function

$$\Lambda(t) = \int_0^t h(u) du \quad (2)$$

which relates to the survivor function simply by

$$S(t) = \exp\left(-\int_0^t h(u) du\right) = \exp(-\Lambda(t)) \quad (3)$$

In this paper we employ a conventional piecewise-constant hazard model with five segments

$$h(t) = \begin{cases} \theta_1, & \text{if } 0 \leq t \leq 6, \\ \theta_2, & \text{if } 6 < t \leq 12, \\ \theta_3, & \text{if } 12 < t \leq 24, \\ \theta_4, & \text{if } 24 < t \leq 36, \\ \theta_5, & \text{if } 36 < t < \infty \end{cases} \quad (4)$$

In this paper we shall also distinguish between three exit modes from de job (un-employment, inactivity, and other job) and three destinations out of the fixed-term contract regime(permanent contract, other fixed-term job, and non-employment). Thus, we define cause-specific hazard functions to destination j

$$h(t)_r = \lim_{\Delta t \rightarrow 0} \frac{(P(t \leq T < t + \Delta t, R = r | T \geq t))}{\Delta t} \quad (5)$$

which yield the aggregate hazard function

$$h(t) = \sum_{j=1}^3 h_j(t) \quad (6)$$

and the survivor function

$$S(t) = \prod_{j=1}^3 S_j(t) \quad (7)$$

The model has a conventional competing risks interpretation. In this framework, a latent duration (T_j) attaches to each exit mode. We only observe the minimum of each latent variable. If risks are assumed to be independent, with continuous duration, this model simplifies to three separate single-cause hazard models. The same simplification can be obtained if we assume that transitions can solely occur at the limits of the intervals, which, for the sake of simplicity, we will do.

A common way to accommodate the presence of observed individual heterogeneity is to specify a proportional hazards model

$$h(t | x) = h_{0j}(t) \exp(x' \beta_j) \quad (8)$$

where $h_{0j}(t)$ denotes the baseline specific hazard function, that is, the hazard function corresponding to zero values for the covariates x . In this case, the covariates affect the hazard function proportionally (i.e. $\frac{dh(x)}{dx_k} = \beta_k h(x)$). An implication of

this assumption is that the impact of the covariates does not change (in relative terms) with the progression of the spell of inaction.

Our information on the elapsed duration is grouped into quarterly intervals (while transitions can only be identified over a fixed interval of one quarter). Let $M = m$ denote the occurrence of an exit in a given month $[c_{t-1}, c_t]$, where m is the realization of a discrete random job duration variable $M \in (1, \dots, K)$. The probability that an event occurs in the m^{th} interval (i.e. that an exit occurs over the course of the 3-month window), and that such an exit is to destination r , will be given (neglecting, for the sake of parsimony, the t and x variables) by the complementary log-log function

$$h_j(m | x) = 1 - \exp[-\exp(\lambda_{mj} + x'\beta_j)] \quad (9)$$

where λ_t condenses the value of the cumulative hazard function over the interval m .

With our sampling plan, the contribution of observation i for the likelihood function is simply

$$L(\beta, \lambda | t, j, x) = \prod_{m=1}^{K-1} \prod_{j=1}^3 [S_j(m-1) - S_j(m)]^{\delta_{mj}} \left[\prod_{m=1}^K S_j(m) \right]^{1-\delta_{mj}} \quad (10)$$

where δ_{mj} is an indicator that assumes the value 1 if the individual exits to destination j during the m^{th} interval, and 0 otherwise. Finally, since individual observations can be repeated (up to six times) the model has to accommodate the presence of individual-specific error terms.

6.3 Estimation Results

The dataset used covers ten potential transitions (eleven quarters). Overall, it contains 98,325 observations, 13.0 percent of which (12,847) correspond to workers with fixed-term contracts.

	E-U		E-I		E-E'	
	estimate	std error	estimate	std error	estimate	std error
Sex	-0.1687**	0.0783	-0.4738*	0.0663	0.3629*	0.0649
Training	0.2651**	0.1212	0.0501	0.1202	0.0504	0.1074
Schooling	-0.0009	0.0121	-0.0550*	0.0105	0.0123	0.0098
First Job	0.0426	0.1329	0.5181*	0.0982	-0.4471*	0.1018
Experience	0.0029	0.0039	0.0244*	0.0030	-0.0280*	0.0036
Left because						
Dismissal	0.2127***	0.1260	-0.2991*	0.1065	-0.0858	0.1037
End FTC	0.4323*	0.1166	-0.0032	0.1010	0.0608	0.0988
Quit	0.0155	0.1330	-0.2094**	0.1058	0.0745	0.0953
Type of employer						
Public Adm.	-0.2364***	0.1253	-0.0661	0.0977	-0.6690*	0.1269
Public Firm	-0.3133***	0.1855	0.1545	0.1217	-0.4559*	0.1636
Hourly Wage (log)	-0.5049*	0.1189	-0.1525	0.0928	-0.4490*	0.1523
Baseline-hazard						
Open-ended Contracts						
λ_1	0.0352	0.8607	-2.0740*	0.6746	0.3491	0.6943
λ_2	-0.6532	0.8664	-2.7707*	0.6800	0.0209	0.6953
λ_3	-0.8581	0.8625	-2.8962*	0.6727	-0.3890	0.6952
λ_4	-1.0775	0.8704	-3.0804*	0.6781	-0.8153	0.7035
λ_5	-2.2101**	0.8746	-3.7878*	0.6793	-1.3544***	0.7043
Baseline-hazard						
Fixed-Term Contracts						
λ_1	0.7810	0.8509	-1.4999**	0.6640	0.5299	0.6899
λ_2	0.5720	0.8533	-1.6094**	0.6642	0.4651	0.6915
λ_3	0.0295	0.8587	-2.3958*	0.6721	0.0561	0.6966
λ_4	-0.3520	0.8825	-2.3391*	0.6892	-0.1213	0.7166
λ_5	-0.2717	0.8867	-2.9043*	0.7084	-0.6707	0.7422
N	98325		98325		98325	
Log Likelihood	-3662.6		-5295.0		-5271.6	

Table 3: TRANSITIONS OUT OF EMPLOYMENT. PIECEWISE-CONSTANT HAZARD MODEL WITH RANDOM EFFECTS. THE MODEL ALSO INCLUDES 10 TIME DUMMIES.

Results in table 3 clearly indicate that workers with fixed-term contracts face higher probabilities of transition to all the destination states considered, as indicated by the parameters of the baseline hazard functions for open-ended and temporary contracts. It is also clear that transition rates decline with job duration.⁶

Transitions out of employment are significantly influenced by human capital variables. Workers with more years of education are less likely to leave their jobs to become unemployed or inactive, but are more likely to leave for another job. Tenure also reduces the probability that the worker makes a transition to unemployment or drops out of the labor force. Longer tenures and higher wages are also associated with fewer transitions to other jobs (E-E'), which is consistent with a matching interpretation.

Things are less clear-cut with labor market experience. The positive sign in the employment to out-of-the-labor force (E-I) equation captures retirements. The negative sign in the employment-to-employment equation has an obvious matching interpretation - more experienced workers are more likely to have found good matches and, for that reason, they are less likely to switch jobs voluntarily. However, a matching interpretation could imply a negative sign in the employment to unemployment, which is contrary to the result we obtained. The fact that experience enhances the probability of becoming unemployed could be the result of mass layoffs, associated or not to plant closings, that imply the termination of good and bad matches alike (hence, more flows of regular workers into unemployment) and hit disproportionately more experienced workers. In the three equations, the type of contract was interacted with tenure.

The results show that the conditional probabilities of making all the transitions considered decrease with tenure. The slope of the hazard is higher in the case of workers with the open-ended contracts than it is for workers with open-ended contracts. For workers with open-ended contracts, the probability of becoming inactive and of switching jobs is close to its baseline level after 12 months of tenure.

The focus on the effects of temporary employment episodes on workers' career prospects highlights the importance of looking at transitions originating in

⁶Note that the baseline hazard function is defined for a benchmark where all covariates take zero values

temporary employment.

The empirical transition rate from temporary employment to permanent employment and to unemployment are depicted in figure Figure 3.

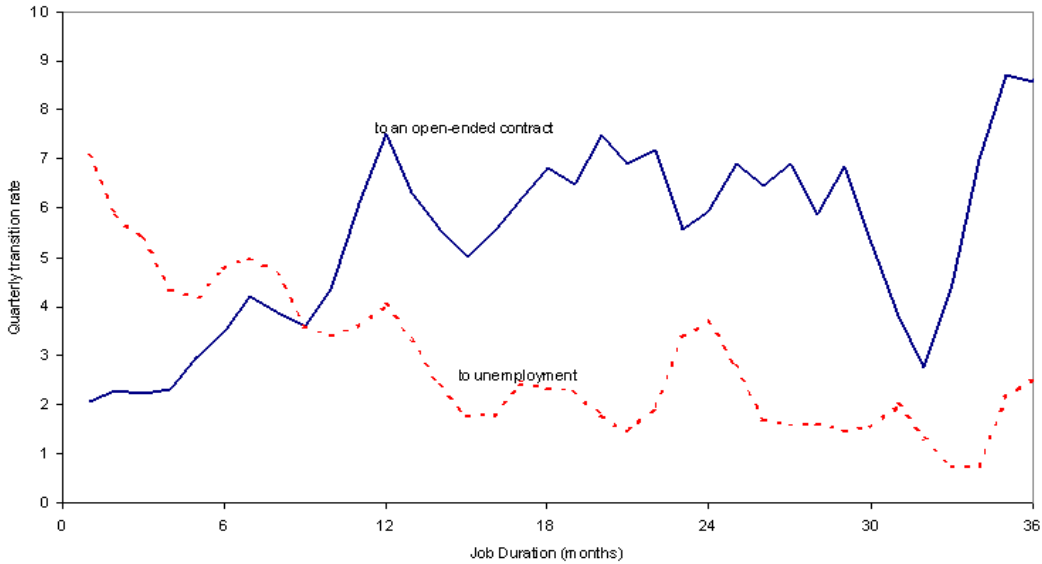


Figure 3: TRANSITION RATES FROM FIXED-TERM CONTRACTS.

Transitions to permanent positions peak at 12 and at 36 months. On the contrary, transitions to unemployment are highest for very short durations, although they have local peaks at twelve and twenty four months. The pattern of transitions observed corresponds to the one implied by a matching process - bad matches are quickly undone and good matches become permanent within a short period (12 month), but also as the legal maximum duration of these contracts (36 months for a number of cases) is reached. Local peaks at 12 and 24 months in transitions to

unemployment may, however, indicate that these contracts also serve (as they are expected to) fill temporary positions and are therefore terminated at their terminal date.

To analyse further this issue, transitions originating in temporary positions were studied in the context of multivariate analysis. Three destination states were considered - from temporary position to a permanent one with the same employer (FTC-OEC in table 4), from one temporary position to another temporary position with a different employer (FTC-FTC'), and from one temporary position to non-employment (FTC-NE).

The equation for transitions from fixed-term to open-ended contracts highlights the role of some human capital variables. Workers with more schooling, training and longer tenures (up to 36 months), but not with more experience, are more likely to receive a permanent contract.

Wages are inversely related to the probability of moving from a fixed-term to an open-ended contract, which means that there is a wage differential compensating workers for job insecurity, but not necessarily for having one fixed-term contract. Wages are also inversely related to the probability of moving another temporary job or to non-employment.

The shape of the baseline hazard function on transitions to permanent employment confirms the results already mentioned - bad temporary matches are quickly undone, but those surviving for longer periods are more likely to become permanent.

Less experienced workers are more likely to engage in on-the-job search and, therefore, switch jobs. Controlling for the same workers characteristics as before, as well as for other relevant factors (such as part-time status, work at unusual hours, and overeducation), having a fixed-term contract significantly raises the probability that the worker searches for another job (Table 5). This indicates that fixed-term contracts are search devices also for workers. Their advantage as such is that they permit searching for the adequate match while employed, thereby reducing the costs of search, with the likely additional advantage of giving workers (especially those with reduced labor market experience) access to better wage distributions (Connolly and Gottschalk, 2001).

In the on-the job search equation, schooling, vocational training and overeduca-

	FTC-OEC		FTC-FTC'		FTC-NE	
	estimate	std error	estimate	std error	estimate	std error
Sex	0.2636*	0.0815	0.1090	0.1199	-0.4466*	0.0761
Training	0.0719	0.1292	-0.0523	0.1917	0.2080**	0.1149
Schooling	0.0328*	0.0119	0.0331**	0.0176	-0.0469*	0.0112
First Job	-0.1973	0.1388	-0.2739	0.2051	0.4786*	0.1297
Experience	-0.0076***	0.0045	-0.0210*	0.0072	0.0062	0.0038
Left because						
Dismissal	0.1393	0.1352	-0.0909	0.2181	-0.0175	0.1324
End FTC	0.0086	0.1258	0.1709	0.1766	0.3306*	0.1097
Quit	0.1925	0.1331	-0.0334	0.2107	-0.0517	0.1398
Type of employer						
Public Adm.	-0.4502*	0.1273	-0.4888**	0.2027	0.1125	0.0992
Public Firm	-0.3678**	0.1791	-0.1166	0.2505	-0.0001	0.1507
Hourly Wage (log)	-0.2109**	0.1037	-0.3086	0.1713	-0.1926***	0.1105
Baseline-hazard						
λ_1	-2.3979*	0.8086	-0.9154	1.2294	-0.3897	0.7311
λ_2	-1.7868**	0.8085	-1.0156	1.2332	-0.5603	0.7329
λ_3	-1.6655**	0.8102	-1.5358	1.2399	-1.1990	0.7365
λ_4	-1.1507***	0.8171	-1.5777	1.2574	-1.3871***	0.7496
λ_5	-1.3755***	0.8265	-2.7941**	1.3170	-1.6685**	0.7604
N	19298		12928		12928	
Log Likelihood	-2525.5		-1370.4		-2860.9	

Table 4: TRANSITIONS ORIGINATING IN TEMPORARY EMPLOYMENT. PIECEWISE-CONSTANT HAZARD MODEL WITH RANDOM EFFECTS. THE MODEL ALSO INCLUDES 10 TIME DUMMIES.

tion (a dummy variable equal to 1 if the employed worker believes that his or her qualifications exceed those necessary at his or her current position) are positively and significantly associated with search efforts.

7 Conclusions

Fixed-term contracts are, by design, associated with more transitions out of employment to all destination states. The results in the employment to unemployment and employment to inactivity equations could indicate that fixed-term contracts are dead-end jobs. However, in a previous paper, we found that employers use fixed-term contracts essentially for screening workers for permanent positions. We argue that the contradiction is only apparent. More transitions from fixed-term contracts to other jobs or non-employment status is not contradictory with these contracts being used as mechanisms of search by employers and workers.

	estimate	std error	mg effect
Sex	0.0283	0.0451	0.0006
Schooling	0.0355*	0.0061	0.0007
Training	0.2201*	0.0606	0.0056
Experience	-0.0022	0.0018	-0.00004
Tenure	-0.0036*	0.0004	-0.0001
First Job	-0.1150**	0.0540	-0.0019
FTC	0.2294*	0.0481	0.0059
Part-time	0.6755*	0.0697	0.0300
Unusual Hours	0.0546	0.0441	0.0011
Hourly wage (log)	-0.4076*	0.0567	-0.0078
Overeducation	0.5643*	0.0609	0.0219
Type of Employer			
Public Administration	0.0277	0.0684	0.0005
State-owned	-0.0987	0.0956	-0.0017
Constant	0.4382	0.3961	
N	99115		
Log likelihood	-3206.1		

Table 5: ON-THE-JOB SEARCH BEHAVIOUR. PROBIT RESULTS

The survival rate of newly-formed matches is endogenous to the amount of pre-hiring search effort. From the standpoint of firms, the availability of low termination costs contracts may stimulate less pre-hiring screening and thereby reduce the proportion of new temporary matches that become permanent.

The quarterly rate of transition from a temporary to a regular job indicates that a non-trivial share of all fixed-term contracts eventually becomes permanent. This result unequivocally means screening. In this context, fixed-term contracts become stepping-stones to regular forms of employment.

The age-earnings profile of workers with fixed-term and regular contracts compared indicates that temporary employment is costly for older workers with more cumulated labor market experience if, for some reason (e.g., job loss due to plant closings), they lose their regular jobs. Temporary employment implies the loss of returns to experience, and age reduces the probability of obtaining a new job.

A particularly strong result indicates that, over the life-cycle, workers with fixed-term contracts receive lower returns to both experience and tenure.

References

- ADAM, PAULA AND PATRIZIA CANZIANI (1998), Partial De-regulation: Fixed-term Contracts in Italy and Spain, CEP Discussion Paper 386.
- BLANCHARD, OLIVIER AND AUGUSTIN LANDIER (2002), The Perverse Effects of Partial Labor Market Reform: Fixed-term Contracts in France, *Economic Journal*, 112 F214-244.
- BLANCHARD, OLIVIER AND PEDRO PORTUGAL (2001), What Hides Behind an Unemployment Rate?, *American Economic Review*, 91 187-207.
- BOOTH, ALISON, MARCO FRANCESCONI AND JEFF FRANK (2002), Temporary Jobs: Stepping Stones or Dead Ends?, *Economic Journal*, 112 F189-213.
- CONNOLLY, HELEN AND PETER GOTTSCHALK (2001), "Dead-end and Stepping-stone Jobs: Theory and Evidence", Boston College (mimeo).
- FARBER, HENRY (1999), Alternative and Part-time Arrangements as a Response to Job Loss, *Journal of Labor Economics*, 17 S142-169.
- GUELL-ROTLAN, M. AND B. PETRONGOLO (2000), Workers Transitions from Temporary to Permanent Employment: The Spanish Case, CEP Discussion Paper 438.
- HOUSEMAN, SUSAN N. (2001), Why Employers Use Flexible Staffing Arrangements: Evidence from an Establishment Survey, *Industrial and Labor Relations Review*, 55 149-170.
- HUNT, JENNIFER (2000), Firing Costs, Employment Fluctuations and Average Employment: An Examination of Germany, *Economica*, 67 177-202.
- OECD (1999), *Employment Outlook*, Paris: OECD.
- PORTUGAL, PEDRO (2000), Volatilidade do Emprego, Protecção ao Emprego e Desemprego, Banco de Portugal (mimeo).
- VAREJÃO, JOSÉ (2000), *Three Essays on Labor Demand*, Doctoral Dissertation, Universidade do Porto.

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