

Human Capital Accumulation in Temporary Jobs: Specific or General?*

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Very preliminary. Please do not quote.

1. Introduction

Flexibilization has been the main labor market policy objective during the last 20 years, and in most OECD countries this has been pursued by allowing temporary hires under less and less binding conditions. According to the flexicurity debate, labor market deregulation implies less job security (the capability to stay with a certain job and employer) that should be compensated by more employment security (the capability to stay employed across jobs and employers). The availability of less costly and more flexible labor contracts should indeed imply an easier entry on the labor market, easier transitions across employment relationships, shorter unemployment and, last but not less important, a higher chance to accumulate actual experience. In other words, emphasis has been shifted from internal to external careers.

In this respect it has been analyzed whether the external career of individuals is limited to their initial period on the labor market or whether it extends over time. A growing body of the literature has been devoted to test the port-of-entry (POE) hypothesis, namely whether temporary jobs act as a stepping stone into open-ended ones, with respect to unemployment. The results of this literature are mixed, hinting that the POE hypothesis holds only under specific circumstances, i.e.

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for specific groups in the population or in given institutional environments [Booth et al. 2002; Jahn and Rosholm 2010; Chalmers and Kalb 2001; Gerfin et al. 2005; De Graaf Zijl et al. forth.; Güell and Petrongolo 2007; Hagen 2003; McGinnity and Mertens 2004]. However, the POE hypothesis only tells a part of the story of external careers. In fact it implicitly assumes the primary relevance of job security, and it may well occur within firms but not across them (e.g. Berton et al. [2009]). Human capital (HC) accumulation and portability in temporary jobs is crucial in assessing the viability of an external career and hence the mere possibility of acquiring employment security. This is an underexplored issue in the literature and it is at the core of the present paper.

The standard Becker's theory of human capital [Becker 1964] has clear predictions on the type of human capital accumulated by workers hired under different contractual arrangements. Temporary workers are expected to accumulate a relatively higher share of general human capital (GHC) with respect to workers employed with open-ended contracts. Consistently with the spirit of labor market deregulation briefly depicted in the lines above, this should ease temporary workers' external careers; intuitively, the more general skills they earn on the labor market should allow them to change jobs across occupations and sectors more easily. This hypothesis can be tested empirically, and this is what we do in the present contribution.

To carry out our test we use WHIP, an Italian matched-employer employee dataset derived from administrative records and containing high-quality and detailed information on workers' careers. We select a sample of entrants in involuntary unemployment after their first job, classifying the latter in terms of the type of contract held (fixed-term or open-ended). We then estimate the unemployment duration in a competing-risk setting, so as to crucially distinguish between exits to employment in the same sector or in a different one. Consistently with the theory, we find that the unemployed whose previous job was a temporary one transit more easily to a new job with in a different sector (as opposed to a job within the same sector) than those whose previous job was a permanent one. We interpret this finding as evidence that the type of HC accumulated in temporary jobs is relatively more of the general type, whereas the HC accumulated while in permanent jobs is more likely to be specific to the work relationship.

The paper proceeds as follows: section two depicts in more details the theoretical framework for the analysis; section three describes the data and the sampling strategy, also providing some descriptive statistics; section four outlines our econometric strategy, while section five proposes our main results. Section six discusses our future research agenda, and in particular the additional steps to be undertaken so as to provide further support to the preliminary results presented here.

2. The theoretical framework

Three hypotheses directly or indirectly follow from Becker's theory and are relevant to our purposes.

- First, firms have no incentive to invest in general human capital (GHC). GHC is by definition transferable to other firms, and in case this happens before the investment is paid back, the firm incurs in a loss.
- Second, firms may decide to invest in specific human capital (SHC). SHC is indeed assumed to be non-transferable; however, quits or labor contract renegotiation would imply a loss whenever they occur before the investment is paid back. As a consequence investments in specific human capital will be larger in longer-lasting work relationships¹ and in work relationships less subject to renegotiation. We thus expect employers to invest more in open-ended workers' SHC.
- Third, workers are in turn expected to invest in GHC in order to have a more valuable and credible outside option. In particular, we expect this incentive to be stronger for less protected workers². We thus expect temporary workers to invest more in GHC with respect to their colleagues working with an open-ended contract.

From both the employers' and the workers' perspectives, then, temporary work relationship should imply the accumulation of relatively more GHC. Under the additional and reasonable assumptions that (i) the probability of moving across firms while holding the same kind of occupation is increasing both in specific and in general human capital, and (ii) the probability of moving across firms changing also occupations is increasing only in general human capital, we can derive the following implication: following a layoff, the relative probability of making a transition across different occupations is higher for temporary workers than for permanent ones. In symbols:

$$(1) \quad Pr_{temp}\{trans(j,k)\} / Pr_{temp}\{trans(j,j)\} > Pr_{perm}\{trans(j,k)\} / Pr_{perm}\{trans(j,j)\}$$

where j , k are different occupations. The perspective of employment security through external careers for temporary workers rests (also) on this hypothesis, which will be tested empirically in this paper.

¹ See Berton and Garibaldi [2006] for a theoretical assessment of this implication.

² See Güell and Petrongolo [2007].

3. Data, sample selection and descriptive statistics

WHIP (Work Histories Italian Panel) is an employer-employee linked database of individual work histories built up by the LABORatorio R. Revelli from the social security administration (INPS) archives. The reference population includes all employees of the private sector, temporary workers from the public administration, craftsmen, traders, professionals without an autonomous security fund and benefit recipients (unemployment, collective dismissals, short-time, maternity and sickness allowances). Careers are observed monthly, with a sampling rate of workers of about 1:90. The observed series at the time of our analysis covers the period 1985 – 2003. Details of the contractual arrangements are observed since 1998, when deregulation of the Italian labor market has been fully implemented.

The main advantage in using WHIP is that working careers and wages earned are observed in details and without measurement errors or recall biases. This comes at the cost of a limited number of worker and firm attributes: gender, age, birthplace, wage, type of contract (open-ended and the different temporary arrangements), part-time, occupation (apprentices, blue collars, white collars and managers), firms size, sector, place of work. In this perspective, one main limitation for our purposes is that occupation is observed only at a very aggregate level. In order to circumvent this limitation we use the two digit sector as a proxy for occupation, arguing that this may be a reasonable choice for blue-collar occupations in the industrial sector³. We test the viability of this hypothesis in section 5 below. Furthermore, to minimize the potential impact of unobserved heterogeneity we further select the sample to include only workers that i) entered the labor market in the period from January 1998 to December 2002⁴, ii) aged 19-25 at entry, iii) with either a full-time open-ended contract or a full-time temporary one, the rationale for this choice being that these two contracts only differ for their planned duration, iv) at their first involuntary unemployment spell⁵ and v) after a unique employment relationship.

We end up with a sample of 1379 blue collar - industrial workers, 1126 of which are males; 975 of these unemployment spells originated from an open-ended contract, with the other 404 from a temporary hire. The median duration of the entry contracts is 5 months for open-ended ones and 4 months for temporary hires. On the whole 332 (corresponding to 24,1%) exits from unemployment

³ Using an alternative data source is part of our current research: see the concluding remarks.

⁴ We define entrants those workers never observed in the sample from 1985 onward. We do not include those who entered the labor market in 2003 since their first transition falls often out of the observed series.

⁵ The cause of separation is not recorded in our data. As it is standard in the literature on matched employer-employee data, we define “involuntary” the unemployment spells lasting at least two months. Unemployment spells lasting more than 18 months are considered right-censored.

occur to the same two digit sector of the previous employment relationship and 336 (24,4%) to a different one; 98 unemployment spells result in a job in which the sector is not observed⁶ and the remaining 613 are censored. Exits to the same or another sector are 252 (25,8%) and 207 (21,2%) respectively for workers with an open-ended job, and 80 (19,8%) and 129 (31,9%) for temporary hires. Table 1 provides a month-by-month detail of such transitions.

Table 1: descriptive statistics

Elapsed time in unemployment (months)	Contract of origin (before the unemployment spell)							
	Open-ended				Temporary hire			
	Destination after unemployment spell:				Destination after unemployment spell:			
	Censored	Same sector	Other sector	N. A.	Censored	Same sector	Other sector	N. A.
2	909	25	31	10	378	3	19	4
3	860	16	15	7	358	2	16	2
4	795	22	23	9	330	9	13	3
5	752	17	17	3	315	7	5	3
6	707	15	13	4	292	3	14	4
7	664	18	15	2	280	3	8	1
8	631	16	12	1	265	8	7	0
9	583	25	15	2	238	12	10	5
10	534	25	11	3	215	13	8	1
11	502	15	10	2	202	3	7	3
12	476	10	5	4	193	0	3	3
13	415	12	10	1	178	5	6	0
14	390	6	3	2	168	4	2	2
15	368	10	7	2	160	2	0	3
16	342	7	6	2	145	1	5	2
17	321	7	8	2	132	2	4	1
18	295	6	6	3	117	3	2	2
Total	9,544	252	207	59	3,966	80	129	39

Source: our computations on WHIP data.

4. The empirical strategy

We estimate a multinomial logit in order to model unemployment duration in a competing-risks discrete-time setting (see Jenkins [2005] for a presentation of this strategy); time is measured in months. In each month and for all workers the dependent variable may take on four values: *0* in case the observed process goes on – i.e. the worker remains unemployed – or the spell is right-censored; *1* when an exit to the same sector is observed; *2* if an exit to another sector occurs; *3* if an

⁶ This happens for non-dependent employment relationships, namely self-employment or independent contracting. We also consider the sector unobservable for agency workers, since in our data we observe the agency's sector and not the user's.

exit occurs but the sector is not observed in the data. The covariates aim at controlling for individual, firm and labor market conditions at entry and for the total amount of actual experience accumulated in the unique employment spell we observe before separation. More specifically, we control for three sets of variables: matrix X includes gender, age at entry and wage at entry; matrix Z the aggregate sector (manufacturing and constructions) and firm size; matrix W the local youth unemployment rate, the geographical area and the year of entry on the labor market to further approximate the business cycle. Actual experience enters the specification as a polynomial of degree three of the duration, in months, of the unique preceding work relationship. We argue that – conditional on X , Z , W and actual experience – the type of contract that regulates the first employment relationship is exogenous.

In order to assess its impact on the relative probability to find a new job in a different sector described under (1), we include in our baseline specification a dummy variable signaling when the preceding contract was a temporary hire (call it D_i). We then specify the model so that exits to the same sector represent the benchmark of our multinomial logit model and estimate exponentiated coefficients (i.e. relative risk ratios, RRR). The hypothesis under study holds if

$$\beta(D) \mid \text{equation: exit to another sector} > 1$$

In this baseline specification $\beta(D)$ captures the average impact along the entire unemployment duration of having had a temporary contract.

However, there are reasons to believe that this impact evolves over time, the first being that human capital depreciates at possibly different rates. For this reason we propose a second specification in which D_i is interacted with the dynamics of the process under analysis; more specifically, we interact D_i with the elapsed duration of unemployment, so that we end up with a time-profile of the relative risk ratios of moving to another sector for both temporary hires and open-ended ones. In this second specification, therefore, the hypothesis under study holds when the time profile of the unemployment duration – measured by a series of T_k with $k = 1, \dots, K$ – of former temporary workers is higher than that of former open-ended ones, i.e. if they exit faster toward a different sector. In symbols:

$$\gamma(T_k \mid D = 1) > \gamma(T_k \mid D = 0)$$

The following section presents the estimation results and a robustness check.

5. Estimation results

Table 2 presents our baseline results. Among the covariates, blue collar workers from the constructions are found, on average, to be less prone to change sector after an involuntary unemployment spell. The youth unemployment rate and the experience one actually accumulates during the first job are also found to be relevant in a non-linear way. Coming to our variable of interest, its coefficient is shown in the last row of table 2: consistently with the predictions of the theory, it is larger than one. However, its significance is slightly lower than standard levels.

Table 2: estimation results, baseline specification

Prob. > chi2: 0		Number of observations: 14276				
Pseudo R2: 0.0354		Wald chi2 (66): 292.25				
Log pseudolikelihood: -3609.3334						
Exit to another sector	RRR	Robust SE	z	P > z 	95% Conf. Interval	
Female	1.0153	0.22913	0.07	0.946	0.6523	1.5801
Age at entry	1.0574	0.04343	1.36	0.174	0.9756	1.1460
Wage at entry (hundreds of €)	0.9839	0.02132	-0.75	0.453	0.9430	1.0266
Construction sector	0.4179	0.07993	-4.56	0.000	0.2873	0.6080
Firm size at entry	1.0000	0.00002	-0.73	0.466	0.9999	1.0000
Youth unemployment rate	1.0926	0.04892	1.98	0.048	1.0008	1.1928
Youth unemployment rate ²	0.9984	0.00064	-2.56	0.011	0.9971	0.9996
North East	1.0102	0.27404	0.04	0.970	0.5936	1.7191
Center	0.8439	0.22078	-0.65	0.517	0.5054	1.4093
South and main isles	0.7364	0.34276	-0.66	0.511	0.2958	1.8336
Entry in 1999	1.3562	0.32400	1.28	0.202	0.8491	2.1661
Entry in 2000	0.9186	0.23197	-0.34	0.737	0.5600	1.5069
Entry in 2001	0.8925	0.25353	-0.40	0.689	0.5115	1.5574
Entry in 2002	1.0756	0.32661	0.24	0.810	0.5932	1.9504
Actual experience	0.8523	0.05416	-2.51	0.012	0.7525	0.9653
Actual experience ²	1.0121	0.00447	2.73	0.006	1.0034	1.0209
Actual experience ³	0.9998	0.00009	-2.71	0.007	0.9996	0.9999
<i>Unemployment duration:</i>						
5 to 7 months	0.7510	0.17018	-1.26	0.206	0.4817	1.1709
8 to 10 months	0.4153	0.09023	-4.04	0.000	0.2712	0.6357
11 to 14 months	0.5423	0.13398	-2.48	0.013	0.3341	0.8801
15 to 18 months	0.6574	0.17959	-1.54	0.125	0.3849	1.1230
Dummy for temporary (D)	1.3794	0.27367	1.62	0.105	0.9350	2.0350

Source: our computations on WHIP data.

Table 3 only presents the coefficients for interacted time-dummies, since the picture for the controls turns out to be not affected by the new specification. The comparison of the lower panel with the upper one shows that our hypothesis holds during the first months of unemployment (up to four) and then it fades away. This implies that the human capital accumulated during the first (and

unique) employment spell⁷ fades away quickly or, which results in the same dynamics, new employers are not prone to consider it a valuable asset after a given unemployment duration.

Table 3: estimation results, interacted time-profiles

	RRR	Robust SE	z	P > z	95% Conf. Interval	
Open-ended contracts						
2 to 4 months	<i>Coefficient normalized to 1</i>					
5 to 7 months	0.8256	0.22283	-0.71	0.478	0.4865	1.4012
8 to 10 months	0.5304	0.14271	-2.36	0.018	0.3130	0.8987
11 to 14 months	0.5956	0.17726	-1.74	0.082	0.3323	1.0673
15 to 18 months	0.8502	0.27095	-0.51	0.611	0.4552	1.5877
Temporary contracts						
2 to 4 months	2.2368	0.80983	2.22	0.026	1.1002	4.5478
5 to 7 months	1.3487	0.52185	0.77	0.439	0.6318	2.8792
8 to 10 months	0.4831	0.15794	-2.23	0.026	0.2546	0.9169
11 to 14 months	0.9499	0.40063	-0.12	0.903	0.4156	2.1711
15 to 18 months	0.9992	0.55010	0.00	0.999	0.3397	2.9395

Source: our computations on WHIP data.

As a robustness check for the viability of our measure of workers' occupation - proxied by the industrial sector of blue collars - we estimate the specification in table 3 on a sample of white collars employed in the service sector (table 4). We expect their skills to be more orthogonal with respect to the specific sector and therefore the coefficients of the interacted dummies to be i) mostly not significant, and ii) not different across contract subgroups. This is indeed the case.

Table 4: estimation results, robustness check on white collars of the service sector

	RRR	Robust SE	z	P > z	95% Conf. Interval	
Open-ended contracts						
2 to 4 months	<i>Coefficient normalized to one</i>					
5 to 7 months	0.6313	0.31578	-0.92	0.358	0.2369	1.6827
8 to 10 months	0.5275	0.27536	-1.23	0.220	0.1897	1.4674
11 to 14 months	0.5092	0.27927	-1.23	0.218	0.1738	1.4918
15 to 18 months	0.8018	0.67284	-0.26	0.792	0.1548	4.1530
Temporary contracts						
2 to 4 months	0.7728	0.36779	-0.54	0.588	0.3040	1.9641
5 to 7 months	0.5736	0.28005	-1.14	0.255	0.2203	1.4935
8 to 10 months	0.2756	0.13743	-2.58	0.010	0.1037	0.7324
11 to 14 months	0.5843	0.32868	-0.96	0.339	0.1940	1.7598
15 to 18 months	2.1983	2.25889	0.77	0.443	0.2934	16.4722

Source: our computations on WHIP data.

⁷ As table 1 showed, its average duration is very short whatever the contract,

6. Conclusions and future research

Following Becker's theory of human capital we expect temporary workers to accumulate more general human capital than workers holding an open-ended contract. This should result in temporary workers having a relatively higher probability to change job across different occupations or, from another perspective, to make external careers. Labor market reforms of the last twenty years, the debate on flexicurity and the parallel idea of «security in the labor market» instead of «security on the job» rest also on this hypothesis.

Using a sample of entrants in the Italian labor market in the period 1998 – 2002 and using the sector at two digits for blue collars employed in the manufacture or constructions to approximate the occupation we find that this hypothesis holds, at least during the very first months of unemployment.

However, the way we measure the occupation, despite all the precautions we used, might be imprecise. For this reason we plan to re-estimate our models using additional data sources in which (i) the occupation is observed at a very fine level; (ii) workers laid-off by the same firm can be identified, allowing for firm-level random effects in estimation; (iii) it is possible to observe firms' closure events, as well as to define industry-wide demand shocks (on sales or value added), and therefore to better identify involuntary unemployment. The latter point might be relevant for checking that the conditional probability of being involuntarily unemployed is not determined by the kind of contract held, or – in other words – that the sample of unemployed is not endogenously selected along the dimension of interest. These are the next steps of our research agenda.

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