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**Human capital accumulation in temporary jobs:  
specific or general?**

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## **Human capital accumulation in temporary jobs: specific or general?**

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**Abstract:** Theoretical considerations suggest that workers holding temporary contracts should accumulate more general human capital than workers under permanent contracts. Using matched employer-employee data, we find empirical support for this hypothesis, by showing that dismissed temporary workers are more likely to change economic sector than workers losing their open-ended jobs.

## **I. Introduction and Theoretical Framework**

During the seventies, employment security was commonly perceived as the ability of a worker to keep the same job (or even task) with the same employer for his or her whole working life, and was consistently supported by statutory provisions that mostly aimed at granting a high degree of employment protection. This approach favoured internal careers and the accumulation of specific skills (Doeringer and Piore, 1971). The recent pressure for more flexibility (OECD, 1994) has resulted in heavy deregulation of temporary contracts and contributed to reassessing the notion of employment security, now understood as the expectation of continued employment, although not necessarily with the same employer or within the same occupation or sector (Wilthagen and Tros, 2004; Auer, 2006). However, whether workers can actually sustain their employability while going through a series of temporary jobs and external careers crucially depends on the portability of human capital. This calls into question the issue of the type of human capital accumulated by workers under different contractual arrangements, as investments in specific skills appear inconsistent with the need of frequently changing jobs.

Human capital theory predicts that, when firms invest in specific skills, they seek stable and long-lasting employment relationships (Acemoglu and Pischke, 1999). In turn, workers with a high probability of frequent job changes optimally choose an average (and thus more portable) mix of skills, while investments in specific human capital appear reasonable for more protected workers only (Lazear, 2009). Hence, as firms have little incentive to invest in workers' general skills (Becker, 1964), one can easily argue that, for any given amount of actual experience, temporary work relationships imply the accumulation of relatively more portable (or

general) human capital. More specifically, the probability of changes across jobs requiring a comparable mix of skills increases with both general and specific human capital, while the probability of making a transition across jobs with more idiosyncratic requirements increases with general skills only. Hence, we derive the following testable implication:

*H1: upon changing firms, the relative probability of making a transition across jobs with different skill requirements is higher for temporary workers than for permanent ones.*

This is an underexplored issue in the empirical literature and testing this hypothesis represents the aim of the present contribution.

## **II. Data**

Our data are drawn from WHIP (Work Histories Italian Panel), a database of individual work histories from 1985 to 2003 derived from the Italian social security archives.<sup>1</sup> We focus on the more recent years (1998-2003), as labour market deregulation was initiated in Italy in 1997 and details about contractual arrangements are recorded only from 1998 onward. The advantage of using administrative data is that career dynamics are recorded in details (e.g. working careers are observed monthly and every kind of contract is identified separately) and accurately measured. This is essential for our research, which would not be feasible if survey-based data

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<sup>1</sup> See [www.laboratoriorevelli.it/whip](http://www.laboratoriorevelli.it/whip) for documentation and details.

(such as LFS) were used. In fact we have been able to select a sample including only unemployment spells following a lay-off<sup>2</sup> experienced by workers who:

- i) entered the labour market from January 1998 to December 2002; hence the whole initial portion of their careers is observed and initial conditions and unobserved heterogeneity concerns are minimized;
- ii) were aged 19-25 at entry, in order to minimize the possibility of previous informal work;
- iii) held either a full-time open-ended contract or a full-time fixed-term contract.

The rationale for this last choice is that, under Italian law, open-ended contracts and fixed-term contracts differ only in their planned duration. Hence, by concentrating on them we prevent possible confounding effects arising from cost differentials, contribution rebates, training clauses, union and collective agreement coverage, or independent and third-party employment relationships, which might affect a worker's mix of skills.

Following Lazear (2009), we measure the job skill mix by combining information on sector and occupation. More specifically, for any given occupation (blue or white collar), we look at transitions across different sectors, measured at both 2- and 3-digit levels. This detailed disaggregation is available in WHIP for the manufacturing sector only, on which we focus our analysis.<sup>3</sup> Our final sample

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<sup>2</sup> We focus on involuntary separations, as any job shopping activity is biased by the endogeneity of choices. Since the cause of separation is not recorded in administrative data, we follow the standard practice used in the literature on matched employer-employee data and define as "involuntary" all unemployment spells lasting for at least one month.

<sup>3</sup> The coding of the service sector is insufficiently detailed in WHIP, since almost 60% of workers in this sector are grouped into only two broad categories, namely those who perform any type of job in

consists of 163 white-collars<sup>4</sup> and 1313 blue collars in manufacturing jobs (see Table 1).

### III. Empirical strategy and results

We estimate multinomial logit models of unemployment duration in a competing-risks discrete-time setting (Allison, 1982). The duration framework allows us to take human capital depreciation into account. Time is measured in months. In each month  $t$  the dependent variable  $y_{it}$  for worker  $i$  takes on the following values: 0 if the worker remains unemployed or the spell is right-censored; 1 for exits to the same sector; and 2 for exits to another sector.<sup>5</sup>

To assess the impact of contract type on the relative probability of finding a new job in a different sector, we include in our baseline specification a dummy  $D_i$  signalling whether the contract held before entering unemployment was temporary. We then specify the model so that exits to the same sector represent the benchmark and we estimate exponentiated coefficients (relative risk ratios). The hypothesis under study holds true if the estimated coefficient of  $D_i$  ( $\beta_D$ ) in the equation for ‘exit to another sector’ ( $y = 2$ ) is greater than 1:

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bars, restaurants, and hotels and those who provide any kind of service to firms. These broad categories would provide too a poor measure of jobs’ skill mix.

<sup>4</sup> Estimates with the tiny sample of white-collars are consistent with those in Table 2. However, they are never significant and are not reported.

<sup>5</sup> Workers moving to a job whose sector is not observed (e.g. self-employment) constitute a further type of exit ( $y=3$ ). Our RRR of interest does not directly depend on the existence of this additional state, by the irrelevant alternatives assumption (IIA). The same holds true for ongoing unemployment spells ( $y=0$ ).

$$RRR = \exp(\beta_D) = \frac{\frac{pr(y=2 | D=1, X)}{pr(y=1 | D=1, X)}}{\frac{pr(y=2 | D=0, X)}{pr(y=1 | D=0, X)}} > 1. \quad (1)$$

Covariates  $X_{it}$  control for individual, firm, and labour market conditions at entry and for the total amount of actual experience accumulated before entering unemployment: gender, age at entry (proxy for education), and wage at entry (to capture workers' initial ability); a control for construction sector, firm size, local youth unemployment rate, geographical area and the calendar year of entry in the labour market to further approximate the local labour market conditions and the business cycle. We maintain that – conditional on covariates and actual experience – the type of contract is exogenous.

Table 2 presents our baseline results in column 1. Controls (not shown) have the expected sign, although only a few are statistically significant – a likely effect of our effort to select a homogeneous sample of workers. Our variable of interest ( $\beta_D$ ), consistently with the predictions of the theory, is greater than 1 and strongly significant.

$\beta_D$  captures the average impact of having had a temporary contract. We next investigate whether actual experience as a temporary worker matters. We expect the relative amount of portable skills one accumulates – and therefore the relative probability of making transitions across different sectors – to increase with actual experience as a temporary worker. To capture this effect, we specify our variable of interest as a spline of the actual experience accumulated under fixed-term contracts, with a single knot at six months (column 2). The results show that having up to six months' experience under a fixed-term contract increases the probability of making a transition to a different sector, but the effect is not significant at conventional levels.

Instead, the coefficient for those who accrued more than six months' experience is greater than 1 and highly significant. This further supports the hypothesis that temporary work experiences shift the human capital mix of workers toward general skills.

Finally, Table 2 shows that our results are unchanged when the sector is defined at the 3-digit level (columns 3 and 4); when construction workers are excluded from the sample, as they combine highly sector-specific skills and are mostly hired with open-ended contracts (columns 5 and 6); and when we use a stricter requirement in terms of intervening unemployment (at least 4 months) to identify involuntary separations (columns 7 and 8).

#### **IV. Conclusions**

Using a sample of entrants in blue-collar manufacturing jobs, we find that dismissed temporary workers are more likely to find a new job in a different sector than permanent workers. We interpret this as evidence that workers holding temporary jobs accumulate a higher relative amount of general human capital, which makes them relatively abler to pursue external careers. Consistently with the spirit of labour market deregulation, this should improve temporary workers' employability at any given level of actual experience. Whether this compensates for poorer overall human capital accumulation (Bassanini *et al.*, 2007), wage loss due to job changes (Lazear, 2009) and flatter career profiles (Frederikson and Kato, 2011) remains an open issue.

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We thank the participants in the workshops “Labor market and institutions” (Essen, 2010) and “Increasing labor market flexibility – boon or bane?” (Nuremberg, 2011) for valuable comments. Collegio Carlo Alberto, with its project “Causes, processes and consequences of flexicurity reforms in the European Union”, is kindly acknowledged for financial support.

## References

- Acemoglu, D., Pischke, J.-S. (1999) Beyond Becker: training in imperfect labour markets, *Economic Journal*, **109**, 112-142.
- Allison, P.D. (1982) Discrete-time methods for the analysis of event histories, *Sociological Methodology*, **13**, 61-98.
- Auer, P. (2006) *Labor market flexibility and labor market security: complementarity or trade-off?*, European Commission, Brussels.
- Bassanini, A., Booth, A., Brunello, G., De Paola, M., Leuven, E. (2007) Workplace training in Europe, in *Education and training in Europe* (Eds) G. Brunello, P. Garibaldi, E. Wasmer, Oxford University Press, Oxford.
- Becker, G. (1964) *Human capital*, Columbia University Press, New York.
- Doeringer, P., Piore, M. (1971) *Internal labour market and manpower analysis*, Heath Lexington Books, Lexington.
- Frederiksen, A. and Kato, T. (2011) Human capital and career success: evidence from linked employer-employee data, Discussion Paper no. 5764, IZA.

Lazear, E.P. (2009) Firm-specific human capital: a skill-weights approach, *Journal of Political Economy*, **117**, 914-940.

OECD (1994) *OECD Jobs Study: evidence and explanations*, OECD, Paris.

Wilthagen, T. and Tros, F. (2004) The concept of flexicurity: a new approach on regulating employment and labour markets, *Transfer-European Review of Labour and Research*, **10**, 166-186.

**Table 1. Descriptive statistics**

<i>Number of workers: 1313 (males: 1074; females: 239)</i>				
<i>Number of unemployment spells: 1561 (after an open-ended job: 1149; after a fixed-term job: 412)</i>				
<i>Former contract/exit to (row %)</i>	<b>Same sector</b>	<b>Other sector</b>	<b>Censored</b>	<b>Unobserved sector</b>
Open-ended	29.0	13.6	51.9	5.6
Fixed-term	21.8	25.0	47.8	5.3

*Source:* own computations on WHIP data

**Table 2. RRR of finding a job in a different sector. Benchmark: exits to the same sector**

	2-digit Sectors		3-digit Sectors		Construction excluded (2-digit Sectors)		At least 4 months of intervening unemployment	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$D_i$	1.795 *** (.3787)		1.519 ** (.3217)		1.738 ** (.4273)		1.854 ** (0.4832)	
<b>Up to 6 months' experience as a temp</b>		1.295 (0.3095)		1.459 (0.3546)		1.231 (0.3403)		1.153 (0.3340)
<b>More than 6 months' experience as a temp</b>		1.931** * (0.5442)		1.627* (0.4621)		1.770 * (0.5614)		2.176** (0.7671)
<b>No. of individuals</b>	1313	1313	1313	1313	808	808	1112	1112

*Source:* own computations on WHIP data

*Notes:* robust SE in brackets. Controls always included. \*\*\*: significant at 99%; \*\*: significant at 95%; \*: significant at 90%