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Temporary jobs: Port of entry, Trap, or just Unobserved Heterogeneity?

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Abstract

We use a 1998 - 2004 sample from WHIP in order to study the labor market transitions of young entrants. We consider seven labor market states: permanent and temporary employment, apprenticeship, training programmes, self employment, quasi subordinate jobs and unemployment. After controlling for individual fixed effects in a dynamic multinomial logit framework, we find that heterogeneity partially explains workers' sorting among the contracts. State dependence exists in all the labor market states, but CFLs, apprenticeship and temporary jobs also represent a port of entry towards permanent employment.

Key words: temporary jobs, port of entry, state dependence

1 Introduction

Temporary workers represent a growing share of the employed workforce in many European countries. The EU25 average was 11.7% in 1997 and reached 13.7% in 2004 (European Commission [2005]). The highest figures concern Spain (32.5% in 2004), Portugal (19.8%) and Poland (22.7%), which experienced an impressive growth in the last few years (the share was 5.8% in 2000). The empirical evidence shows that the flows into temporary employment are all but negligible also in countries with a more stable aggregate pattern: during the nineties, over 90% of new hires in Spain have been signed under temporary contracts (Dolado et al. [2002]); in Italy, in the same period, about 50% of the workers entered the labor market through a flexible job (Berton and Pacelli [2007]).

Several reasons stand behind this success. De Graaf-Zijl [2005] argues that the main one concerns the employers, and it is the reduction in firing costs. The theory (Bertola [1992]) shows that a reduction in firing costs leads to higher turnover, with ambiguous effects on the average employment rate; this is exactly what de Graaf-Zijl finds in her review of the empircal literature. Temporary jobs

can be attractive from the labor supply standpoint too. Berton and Garibaldi [2006] and Bover and Gomez [2004] show theoretically that unemployed workers searching for a temporary job experience a shorter unemployment duration; this result finds empirical support in Berton [2007] for Italy, Van Ours and Vodopivec [2006] for Slovenia and Bover and Gomez themselves for Spain. Secondly, flexible contracts should allow to more easily combine work and family life. The literature seems to be less unanimous about this point; in the examples quoted by de Graaf-Zijl, agency jobs allow high-skilled British women to work out a better combination, but job instability is found to negatively affect family formation in the US and Spain. As for Italy - the reference country in our analysis - Bertolini et al. [2007], through in-depth interviews to young female workers from the Province of Turin, find that temporary contracts are seldom a matter of choice and much more frequently they are the only way to find a job. In Italy, the combination between work and family activities is more likely to occur through part time jobs; ISTAT [2005] uses the Labor Force Survey and points out that the share of involunary part timers was 30% in 2004; Berton and Pacelli [2007] find that women represent a disproportionately high share in all part time jobs, but stress that almost 85% of all part time jobs in 2002 was a permanent job.

Our goal is to understand what happens after one enters a temporary job. Are temporary jobs a port of entry towards permanent employment or do the workers run the risk of being trapped into temporary jobs[1]? As de Graaf-Zijl shows, the stepping-stone hypothesis holds for some countries (Germany, the Netherlands and UK) but not for others (Spain and the US). As far as Italy is concerned, results are ambiguous: Gagliarducci [2005] finds that the probability of finding a permanent job grows with the duration of previous employment spells, but decreases with its number, so that it is not temporary jobs *per se* to be detrimental for future career opportunities, but their repetition. Ichino et al. [2005] focus on the jobs provided by temporary work agency in Tuscany and Sicily; their effect on the probabilty of being employed again eighteen months later is positive in the former region, but not significant in the latter. In Contini et al. [1999] short employment spells are not detrimental for young workers. Berton and Pacelli [2007] shed a light on the type of contract one gets after an unemployment spell and, after controlling for limited observed heterogeneity, they find descriptive evidence of persistence in the same type. Picchio [2006] directly face the hypothesis of true state dependence; his evidence supports this argument, but is limited by the short time span of the analysis and by a wide aggragation in the types of contracts.

We evaluate the port of entry and the true state dependence hypotheses on the Italian labor market, in the medium run and in a multi state framework.

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[1] In principle a third possibility should be taken into account: workers could choose a flexible career, made of repeated temporary employment spells. This hypotesis seems to be disregarded by the literature: all over Europe, temporary workers feel the highest level of future job insecurity (de Graaf-Zijl [2005]). Moreover, Madama and Sacchi [2007] highlights that in Italy the social protection system (including pensions, unemployment benefits, maternity, sickness and family allowances) still does not fit flexible workers' needs.

This allows us to distinguish among contracts with different features (permanent, temporary in strict sense, but also trainees, apprentices, agency workers, quasi-subordinate, self-employed and professionals[2]) and to include unemployment as a possible labor market condition. In order to do that WHIP, a large dataset of work histories built up by LABORatorio R. Revelli from the Italian social security administration archives, will be used. As for the econometric approach, we mainly refer to Magnac's dynamic multinomial logit with fixed effects.

We get three main results: i) individual heterogeneity plays a crucial role in sorting the workers into the contracts; nonetheless ii) whatever the initial state of a worker, retaining the same labor contract is always the most likely destination, even after individual heterogeneity is controlled for. Despite this sound evidence of state dependence iii) the stepping stone hypothesis cannot be completely disregarded, in the sense that the transition to permanent employment is more likely for employed workers than for unemployed individuals.

This paper proceeds as follows: section 2 reviews the theoretical reasons for persistence and the stepping stone hypotheses, section 3 presents the data and section 4 the descriptive evidence. Sections 5 and 6 respectively contain the econometric approach and our main results, whose discussion is in section 7. Section 8 draws the conclusions. The appendix is dedicated to the institutional framework.

2　The theoretical framework

Three main reasons stand behind the possibility that temporary jobs represent a stepping stone into permanent employment:

- Temporary jobs can be used as a screening device (O'Flaherty and Siow [1995]). Since ability cannot be perfectly observed, the employers often decide to post temporary vacancies in order to screen the workers, and to permanently retain the ones who proved to be more productive. This mechanism is often called "up or out rules".

- Temporary workers may receive on-the-job training that helps them in the transition to permanent employment. The literature focuses on the comparison between temporary and open ended contracts. Berton and Garibaldi [2006] unambiguously show that temporary workers have a strictly lower probability to receive training. As de Graaf-Zijl writes, "...a firm with a short term labor force faces a reduced incentive to invest in training" since "...the costs of training need to be earned back. The shorter a worker remains with the firm, the shorter the pay back period". The empirical evidence unanimously supports this hypothesis. Nonetheless, it is still plausible to assume that temporary workers receive more training than unemployed individuals; in this respect, we can expect that workers

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[2]See the appendix for the institutional details.

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are more likely to get a permanent job through a temporary one than through off-the-job search.

- Even if no training is provided, temporary jobs allow the worker to build a network of contacts that in turn increase permanent employment opportunities.

For some workers temporary jobs may also become a trap, but the literature does not provide any specific theoretical explanation for such persistence. In the following, without being exhaustive, we will try to understand when it may happen.

- Let us turn back to the screening framework we briefly depicted above. If the wage is not flexible enough, and in particular if a minimum wage higher than the outside option of the less capable workers does exist, adverse selection cannot be completely avoided and a share of less productive workers will apply for the vacancy. As long as ability is match-specific or does not become public information, the workers will go on trying different jobs until an efficient match is found. In this framework the individual persistence in temporary jobs depends mainly on ability and only a little on the information about job's characteristics that the worker has; the minimum wage, infact, makes the screening contract always preferable to the outside option[3].

- Güell [2000] argues that temporary jobs allow the employers to maximize workers' on the job effort, as long as this increases the probability of retention. In this case temporary employment is a generalized policy, and individual or firm's characteristics do not matter. In other words, everybody should persist in temporary jobs.

- Temporary workers as a buffer to face demand shocks. Profit maximizing behaviour requires the employers to adapt the workforce to the level of the demand. If only permanent contracts are available, firms are forced to inefficiently retain a share of the workforce when demand is low, making lower profits. With temporary contracts instead, they are able to fit demand conditions. In this framework, individual persistence emerges when heterogeneous ability is introduced. Highly productive workers are likely to be profitable both during downturns and upturns; therefore, they enjoy a permanent job. On the contrary, less endowed individuals become profitable only when their productivity receive a positive shock (upturns) and work only when demand is high.

- In Berton and Garibaldi [2006] workers with a low non-labor market option endogenously sort into the temporary market. The intuition is that

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[3]In Italy the entrants to the labor market are not entitled to the unemployment benefit since a minimum amount of past contributions is required. This principle also excludes many discontinuous workers (Madama and Sacchi [2007]).

finding a temporary job is easier, and individuals with a more stringent budget constraint need to earn a wage as soon as possible. As long as the constraint persists we should therefore observe also persistence in the type of labor contract. Whether this hypothesis is reasonable is hard to say; the outside option dynamics (meaning how family income, savings, financial stocks etc. change in time) is difficult to observe, but as far as wage is concerned, a non-positive difference between temporary and permanent workers is sound evidence (de Graaf-Zijl [2005]). This means that it is not through a temporary job that one can recover some wealth differential with respect to permanent workers.

- Tastes and preferences. Persistence in temporary employment is observed as long as some (possibly many) individuals prefer temporary jobs. As we have discussed in the introduction, the hypothesis of an easy combination between work and family life finds some empirical support in Europe, but not in Italy.

- Statistical discrimination (stigma). When productivity cannot be observed, it is possible that employers look at some other individual features (age, education, experience but possibly also race and gender) as proxies; this behaviour may induce discrimination upon the workers. In a two-periods model with a screening step in the first period and a permanent job in the second, the candidates coming from the subgroups where the average ability is expected to be lower are offered a lower wage. This means that as long as temporary workers are supposed to be of lower ability, they receive worse job offers, whatever their real productivity level. In countries where wages are rigid, employers reduce the costs through temporary contracts. At least two mechanisms may induce employers to believe that temporary workers have lower ability: they receive less training (see above) and have a lower incentive to invest in human capital (a sort of self-fulfilling prophecy). In these cases persistence in temporary jobs is not due to some (observable or not) individual characteristic, but to past temporary jobs themselves. These are the cases of what we call true state dependence.

In real world all these possible interpretations are likely to overlap, but as Dolado et al. [2002] point out, there's no theoretical approach that is able to keep altogether. In general, we can say that all such models bring transitions and persistence back to two broad explanations: heterogeneity and a true autonomous effect of the specific contract. Our goal is to control for the role of heterogeneity; residual effects will be interpreted either as stepping stone or true state dependence.

3   The data

We use WHIP, the Work Histories Italian Panel, to its full potential. It includes self employed, quasi subordinate workers, benefit recipients as well as

Table 1: Entry contract in 1998

Entry contract	Frequency no.	Males %	Females %	Total %
Standard	2,336	27.95	31.64	29.61
Temporary	884	9.27	13.57	11.21
CFL	652	8.76	7.66	8.26
Apprentices	1,656	22.42	19.25	20.99
Quasi subordinate	668	6.32	11.09	8.47
Self employees	1,693	25.28	16.8	21.46
Total	7,889	100	100	100

Sample in 1998

Standard: permanent contract (w/wo subsidies)

Temporary: fixed term, temporary agency, seasonal

CFL: on the job training contract

Self-employees: artisans, traders, professional

employees. It excludes only civil servants on a permanent contract, agricultural workers, high skill professions (e.g. lawyers). It also excludes workers in the black economy, by definition.

To perform our empirical analysis, we select a flow sample of entrants in employment as follows. We select native people under 40 years of age never observed in employment before 1998[4], that start their first paid job during 1998. We then follow them until the end of 2004. We exclude from the analysis entrants with a fixed term contract employed in the public sector, as their eventual transition to a permanent contract in the same public sector would be unobservable. In this setting, non employment spells can be easily labelled "unemployment spells", as transitions "back and forth" to non observed contracts are extremely unlikely. We have however to allow for employment spells in the black economy. On the other hand, when we observe workers receiving the unemployment benefit we are sure about their position.

We observe almost 8000 individuals aged 15 to 39 in 1998, 45% of them women.

4 Descriptive evidence

4.1 Entry contract

Table 1 details the entry contract by gender. About 30% of individuals enter with a standard contract, 20% as apprentices and another 20% as self employees; about 10% as trainees (CFL), quasi subordinate and temporary.

Gender is a proxy for tastes and a relevant dimension of heterogeneity in general. Age at entry is a proxy for the initial endowment of ability (education, eventual experience in the black economy or without a contract, time spent looking for the first job). Differences by gender and age at entry are sizeable. Females are more likely - with respect to males - to start their working career

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[4]Between 1985 and 1997.

Table 2: Age at entry

Entry contract	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	Total
Standard	17.85	32.74	32.28	29.26	36.96	29.61
Temporary	9.96	15.73	10.07	6.4	5.37	11.21
CFL	3.43	10.42	13.94	4.65	0.00	8.26
Apprentices	64.55	22.61	0.00	0.00	0.00	20.99
Quasi subordinate	1.68	5.92	13.88	13.37	12.58	8.47
Self employees	2.52	12.58	28.74	46.32	44.94	21.46
Total	19.60	35.77	23.29	13.08	8.26	100.00

Column percentages; total: row percantegs

with a temporary or quasi subordinate contract. Modal age at entry (table 2) is between 20 and 24 years. The large majority of younger workers (15 - 19 years old) enter as apprentices. Temporary contracts are entry contract mainly for individuals under 30 years of age[5], while the other contracts and quasi subordinate ones in particular, are more often the entry contracts of more mature individuals.

4.2 Transitions

Table 3 shows how the stock of every contract evolves over time. We observe the position of the individuals in the sample every October from 1998[6] to 2004; these are not transitions. We see that unemployment is almost constant, involving one individual out of four every year. This is in line with an average youth unemployment rate of 22.6%[7] in Italy in those years. Standard contracts double over the period considered, starting from about 20%[8]. The number of self employees is constant over time. CFLs and apprentices decrease sharply, while temporary contracts increase. Quasi subordinate workers increase after 2001 because of the enlargement of this contract to manual tasks.

Table 4 shows average transition rates in the raw data. Every panel contains transitions at wider intervals, from one year distance to six years distance. In general individuals move to the same contract, to a standard contract or to unemployment; all other transitions are quite rare. Persistence along the diagonal appears to be substantial. Self employees display the largest one, with levels fading down slowly at increasing intervals, when a non negligible share move to permanent employment or to unemployment. Persistence is high for standard workers too, but it falls more rapidly; permanent workers display a growing transition rate to unemployment, showing that open ended contracts do not com-

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[5] CFL and appenticeship contracts have age limits, while temporary contract do not. See the appendix.

[6] Notice that about 10% of workers starts the first employment spell in November or December 1998, and are labelled unemployed in October 1998. Entrants between January and September 1998 might have changed their position in the meanwhile.

[7] Referred to 15 - 24 years old in 2003.

[8] One third of entrants with a standard contract are unemployed in October 1998 because they enter in November or December of that year.

Table 3: Composition of the sample every October, by contract

Year	U I	Standard	Temporary	CFL	Apprentces	Quasi sub.	Self empl.	Total
1998	0.276	0.214	0.057	0.072	0.136	0.052	0.193	1.000
1999	0.265	0.231	0.052	0.077	0.132	0.026	0.217	1.000
2000	0.262	0.291	0.056	0.038	0.123	0.016	0.214	1.000
2001	0.249	0.337	0.050	0.031	0.100	0.016	0.217	1.000
2002	0.231	0.381	0.057	0.023	0.075	0.019	0.214	1.000
2003	0.229	0.405	0.062	0.016	0.055	0.021	0.212	1.000
2004	0.231	0.424	0.067	0.007	0.042	0.016	0.213	1.000

pletely prevent the possibility of losing a job. Temporary and quasi subordinate workers display lower and decreasing levels of persistence that nonetheless does not completely disappear at larger intervals; both suffer from frequent exit to unemployment but enjoy increasing transition rates to permanent employment and self employment respectively[9]. Training contracts (CFLs) and apprenticeship provide for a formal transition mechanism to permanent employment. This is evident for trainees, whose legal duration is up to 24 months: they experience a growing transition rate to permanent jobs and a low possibilty of exit to other contracts, with a degree of persistence that completely fades away at longer intervals. Apprentices persist longer (the training period is up to five years) and display a lower transition rate to permanent jobs. Finally, persistence in unemployment decreases over time, but it's still at 24% after six years.

The evidence depicted so far mixes up the effects of heterogeneity, of genuine port of entry effects and of true state dependence. In the next section we describe how we desentangle these components.

5   The econometric strategy

We are interested in dynamic models in which multiple labor market states can be taken into account. In this framework the main issue in disentangling the effect of heterogeneity is the treatment of unobserved components. Continuous time models are in general more careful about the dynamics of the process and less on unobserved heterogeneity, which is often described as a random effect that multiplicatively enters a proportional hazard. On the contrary, the discrete time setting allows the introduction of unobserved fixed effects, possibly correlated with other individual characteristics; the price to pay is a poorer dynamic specification: usually, a Markov chain. Since our concern is mainly on unobserved heterogeneity, we follow the second strategy and use the approach proposed by Magnac [2000]. The model goes as follows: for each individual $i \in \{1, ..., N\}$ the latent propensity level y_{ijt}^* to be in state $j \in \{0, ..., K\}$ at time $t \in \{2, ..., T\}$ is a function of the lagged state variables and of unobserved

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[9]The separation between quasi subordinate workers and a part of self employees is based upon an "activity code" that is likely to suffer from measurement errors. The transition intensity between the two states is therefore less reliable.

Table 4: Average transition rates, row percentages

t-1	U I	Standard	Temporary	CFL	Apprentices	Quasi sub.	Self empl.	Total
U I	**61.84**	14.16	7.47	2.76	6.63	2.42	4.72	100
Standard	11.75	**81.56**	2.86	0.97	0.82	0.48	1.55	100
Temporary	25.01	26.38	**38.41**	4.57	2.55	1.22	1.87	100
CFL	11.65	40.54	5.23	**39.70**	1.09	0.44	1.33	100
Apprentices	15.19	15.54	2.26	1.49	**63.87**	0.27	1.39	100
Quasi sub.	30.84	11.18	6.22	1.43	1.09	**37.14**	12.10	100
Self empl	4.69	2.70	0.96	0.22	0.17	0.46	**90.79**	100

t-2	U I	Standard	Temporary	CFL	Apprentices	Quasi sub	Self empl.	Total
U I	**49.84**	20.51	8.46	3.32	8.52	2.68	6.68	100
Standard	18.06	**70.88**	4.05	1.85	1.58	0.76	2.81	100
Temporary	30.52	30.65	**24.75**	5.73	4.21	1.66	2.49	100
CFL	15.02	57.14	4.27	**19.06**	1.25	0.63	2.63	100
Apprentices	22.33	22.15	3.16	2.61	**46.71**	0.49	2.54	100
Quasi sub.	37.71	16.28	6.51	3.37	2.07	**22.44**	11.60	100
Self empl.	7.22	4.51	1.31	0.40	0.24	0.51	**85.81**	100

t-3	U I	Standard	Temporary	CFL	Apprentices	Quasi sub.	Self empl.	Total
U I	**41.45**	26.25	9.24	2.66	9.05	2.86	8.49	100
Standard	20.77	**65.51**	4.86	1.84	2.23	0.83	3.95	100
Temporary	28.77	38.15	**18.37**	4.36	4.83	1.95	3.58	100
CFL	16.41	68.27	4.01	**5.36**	1.43	0.72	3.80	100
Apprentices	22.54	31.20	3.83	3.05	**34.36**	0.81	4.22	100
Quasi sub.	38.80	22.40	6.12	2.80	2.41	**13.22**	14.26	100
Self empl.	9.89	6.99	1.60	0.40	0.32	0.65	**80.16**	100

t-4	U I	Standard	Temporary	CFL	Apprentices	Quasi sub.	Self empl.	Total
U I	**34.97**	30.87	9.79	2.43	9.11	2.89	9.95	100
Standard	22.77	**61.49**	5.52	1.70	2.33	1.08	5.11	100
Temporary	26.08	44.44	**13.96**	3.35	5.37	2.07	4.73	100
CFL	17.86	69.78	3.48	**2.35**	1.36	0.85	4.32	100
Apprentices	22.67	38.40	4.46	2.88	**24.86**	1.01	5.71	100
Quasi sub.	35.98	27.83	6.37	2.12	1.84	**9.49**	16.36	100
Self empl.	12.28	8.82	1.68	0.30	0.36	0.83	**75.73**	100

t-5	U I	Standard	Temporary	CFL	Apprentices	Quasi sub.	Self empl.	Total
U I	**29.33**	36.32	10.50	1.73	8.27	2.79	11.06	100
Standard	25.13	**58.19**	5.42	1.47	2.39	1.21	6.18	100
Temporary	24.77	47.70	**13.45**	2.70	4.14	1.72	5.52	100
CFL	18.02	69.66	3.61	**1.42**	1.15	1.04	5.09	100
Apprentices	22.70	41.84	5.16	2.73	**19.33**	1.14	7.10	100
Quasi sub.	32.01	31.39	8.08	1.17	1.32	**9.17**	16.86	100
Self empl.	14.18	10.44	2.13	0.18	0.39	0.95	**71.73**	100

t-6	U I	Standard	Temporary	CFL	Apprentices	Quasi sub.	Self empl.	Total
U I	**24.02**	42.21	10.70	0.78	7.63	2.11	12.54	100
Standard	27.34	**54.59**	6.09	1.19	2.31	1.39	7.08	100
Temporary	23.14	50.41	**12.25**	2.03	3.91	2.03	6.24	100
CFL	19.89	67.59	3.36	**0.74**	0.98	1.23	6.22	100
Apprentices	22.80	44.44	6.00	2.34	**15.19**	1.21	8.02	100
Quasi sub.	30.80	34.04	8.88	0.74	1.30	**7.86**	16.37	100
Self empl.	15.54	10.87	2.43	0.22	0.34	1.00	**69.61**	100

heterogeneity ϵ_{ijt}

$$y_{ijt}^* = \sum_{k=0}^{K} \delta_{kj}1[y_{it-1} = k] + \epsilon_{ijt}$$

where the unobserved components ϵ_{ijt} are decomposed into an individual and state-specific effect α_{ij} and residuals u_{ijt}. Observed states y_{ijt} are the states with maximum propensity

$$y_{it} = j \text{ if } y_{ijt}^* = Max_k(y_{ikt}^*)$$

If the residual components u_{ijt}, conditional on α_{ij}, are extreme value distributed and independent across states, individuals and periods, the probability to be in state j at time t for individual i given that she was in state k in the previous period, reads

$$\Pr\{y_{it} = j | y_{it-1} = k; \alpha, \delta\} = \frac{\exp(\delta_{kj} - \delta_{k0} + \alpha_{ij} - \alpha_{i0})}{1 + \sum_{l \neq 0} \exp(\delta_{kl} - \delta_{k0} + \alpha_{il} - \alpha_{i0})}$$

Identification requires to set the parameters related to destination state 0, $(\alpha_{i0}, \delta_{k0})$, to zero as a normalization constraint. In order to remove the individual and state-specific effect α_{ij} the following ratio is considered

$$\frac{\frac{\Pr\{y_{it}=j|y_{it-1}=k;\alpha,\delta\}}{\Pr\{y_{it}=0|y_{it-1}=k;\alpha,\delta\}}}{\frac{\Pr\{y_{it}=j|y_{it-1}=0;\alpha,\delta\}}{\Pr\{y_{it}=0|y_{it-1}=0;\alpha,\delta\}}} = \exp(\delta_{kj} - \delta_{0j})$$

The state parameter δ_{kj} is identified once the additional normalization $\delta_{0j} = 0$ is imposed. Quoting Magnac, the interpretation is as follows: "...if δ_{kj} is positive, the odds of being in state j with respect to state 0 when the lagged state is k are larger than when the lagged state is 0". If the true state dependence hypothesis holds the estimated transition parameters when the lagged and the current states are equal are larger than when they differ. In principle, state dependence does not exclude a stepping stone effect: a positive state parameter δ_{kj} when the reference state is unemployment means that getting the destination j is easier if the current state is k instead of unemployment; in this case, labor market condition k would be a port of entry to j.

Estimation uses a conditional maximum likelihood method. The individual contribution is derived in Magnac's appendix B and reads

$$\Pr\{y_{i2}, ..., y_{iT-1} | y_{i1}, Y_{i1}, ..., Y_{iK}, y_{iT}\} = \frac{\exp \sum_{k>0} \sum_{j>0} \left(\sum_{t>1} 1[y_{it} = k] \times 1[y_{it-1} = j] \times \delta_{jk} \right)}{\sum_{B} \exp \sum_{k>0} \sum_{j>0} \left(\sum_{t>1} 1[y_{it} = k] \times 1[y_{it-1} = j] \times \delta_{jk} \right)}$$

where $Y_{ik} = \sum_{t=2}^{T-1} 1[y_{it} = k]$ is the number of occurencies of state k for individual i from time 2 to $T-1$ and $B = \left\{ b = (y_{i2}, ..., y_{iT-1}) | \forall k > 0; \sum_{t=2}^{T-1} 1[y_{it} = k] = Y_{ik} \right\}$

is the set of all the possible state sequences that are compatible with the number of occurrences of each state. This method compares the work histories that are equivalent in terms of the number of occurrences but differ for the sequence of the states. The variability between time 2 and $T-1$ is informative about the transitions among states; for this reason, stable histories do not enter the likelihood function and at least four periods must be observed.

Our specification include seven work states (permanent and temporary workers, apprentices, trainees, quasi subordinate and self employed, with unemployment as the reference condition) and up to seven yearly observations (from 1998 to 2004).

6 Results

We estimate δ_{kj} at 12 as well as at 24 months intervals (in which case we exploit the minimum of four observations per individual). U is unemployment and is taken as the reference state, d_{kj} is the state parameter empirical counterpart and

$$exp(\delta_{kj}) = \frac{\frac{pr(k \to j)}{pr(k \to U)}}{\frac{pr(U \to j)}{pr(U \to U)}}$$

Positive (negative) figures mean that the odds of taking contract j with respect to unemployment when the lagged state is k are larger (smaller) than when the lagged state is unemployment. Thus, if $d_{k'j} > d_{k''j}$ the odds of taking contract j (with respect to unemployment) when the lagged state is k' are larger than when the lagged state is k''; if $d_{kj'} > d_{kj''}$ the odds of taking contract j' when the lagged state is k are larger than the odds of taking contract j''. In tables from 5 to 8 the rows compare the odds of taking different contracts keeping the origin state constant; the columns display the odds of taking one specific contract for different lagged conditions. In tables 6 and 8, on-diagonal coefficients larger than the other elements on the same row are evidence for the true state dependence hypothesis. Positive figures under the "Standard" column mean support for a genuine stepping stone effect.

First of all we notice that almost all figures in tables 5 to 8 have a positive sign, meaning that entry in any state is in general easier when one was employed in the previous period. This may be considered empirical evidence for a "network effect" on the probability of being employed in the future (see section 2) and lead us to a first consideration:

Claim 1 *Unemployment, with respect to employment, is detrimental in order to enter almost any labor market state.*

Then we can compare d_{kj} measured with raw transitions from table 4 with estimates that work out individual fixed effects. This comparison is informative about individual heterogeneity: as long as it plays a role in workers' sorting among different contracts, we expect d_{kj} to change after time invariant effects

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are controlled for. Moreover, we expect the coefficient on the main diagonal to decrease in absolute value, since the same individual characteristics that sorted a worker into contract j are likely to retain her there furtherly. Our findings support these hypotheses: both at one (tables 5 and 6) and at two years intervals (tables 7 and 8) almost all the transition and persistence coefficients (respectively the elements off and on the main diagonal) decrease after fixed effects are controlled for, meaning that most of the raw rates are amplified by the individual characteristics. Only at two years distance the heterogeneity prevents the workers from moving into temporary jobs (column 2 in tables 7 and 8). Therefore:

Claim 2 *Individual heterogeneity explains part of the observed raw transition rates. In most cases the effect is an overestimation.*

Nonetheless, persistence is still far from fading away. Table 6 shows that for any given contract, the most likely destination state is the same contract, even after fixed effects have been removed. At one year distance each single contract duration plays a major role: it's likely to be the case for permanent jobs, CFLs and apprenticeship, whose maximum legal durations are two and five years respectively, but not for quasi subordinate workers, who enjoy work relationships shorter than one year on average. We therefore expect state dependence to decrease in most cases when computed at larger intervals. Table 8 shows what happens at two years distance. The coefficients on the main diagonal actually decreas, but still represent the row-specific highest figures. Three aspects are worth a comment: i) state dependence in CFLs is high even beyond the maximum legal duration of the contract, meaning that trainees are likely to experience more than one training spell; ii) state dependence in permanent jobs falls dramatically, confirming that open ended contracts do not completely prevent a worker from losing her current job; iii) self employment is more likely to be a choice of the worker; this induces the very high persistence coefficient we read in the tables.

Claim 3 *Whatever the entry state, retaining the same contract is the most likely destination. This effect persists after controlling for time invariant individual effects, at one as well as at two years intervals. We interpret this result as evidence of true state dependence.*

Insights about the stepping stone hypothesis are provided by figures in column one of tables 6 and 8. Notwithstanding the presence of true state dependence, permanent jobs are more easily accessible from employment than from unemployment, whatever the contract. In particular, CFLs display the highest coefficient both at one and at two years distance, possibly implying a positive effect of their formal training content. The objection that employers were forced by the law to retain at least 50% of the trainees is not relevant since i) the employers were perfectly aware of that; as a consequence, only highly capable workers may have been selected for CFLs but ii) unobserved heterogeneity is

Table 5: d(kj) from raw transition rates, one year interval

	Standard	Temporary	CFL	Apprentices	Quasi sub.	Self empl.
Standard	3.412	0.701	0.615	-0.429	0.043	0.547
Temporary	1.527	2.543	1.410	-0.050	0.220	-0.021
CFL	2.721	1.313	4.335	-0.136	-0.036	0.403
Apprentices	1.497	0.208	0.787	3.669	-0.789	0.181
Quasi sub.	0.459	0.513	0.038	-1.110	3.427	1.637
Self empl.	0.922	0.527	0.050	-1.084	0.919	5.536
From raw estimates						

Table 6: d(kj) estimates controlling for individual fixed effects, one year interval

	Standard	Temporary	CFL	Apprentices	Quasi sub.	Self empl.
Standard	**2.5804**	**0.5234**	-0.0129	**-0.5287**	0.3317	**0.6092**
	0.0621	0.0883	0.1349	0.1332	0.1827	0.1426
Temporary	**1.1859**	**1.7534**	**1.0140**	0.0161	0.1711	0.1514
	0.0865	0.0931	0.1625	0.1808	0.2326	0.2502
CFL	**1.6347**	**1.2510**	**3.8665**	-0.0825	0.4234	0.4119
	0.1174	0.1673	0.1979	0.2830	0.4271	0.2932
Apprentices	**0.6545**	0.0811	0.2880	**2.3152**	**-1.0055**	-0.1967
	0.0931	0.1515	0.2018	0.0948	0.4447	0.2588
quasi sub	**0.5101**	0.6982	0.2921	-0.5515	**2.2653**	**1.5625**
	0.1603	0.1791	0.3613	0.4621	0.1592	0.1983
self emp	**0.7898**	**0.8068**	0.5269	-0.0260	**1.0619**	**3.5493**
	0.1486	0.2022	0.3482	0.3627	0.2810	0.1273
s.e. in second rows. Bold if 95 pct significant						

controlled for[10]. Results are significant for temporary jobs and apprenticeship too. Quasi subordinate workers and self employees display significant coefficients only at one year interval. Thus, we are in a position to state that

Claim 4 *The stepping stone hypothesis holds too; in particular, CFLs represent the best port of entry to permanent employment.*

Finally, an ordering among the contracts with respect to the probability of taking a permanent job seems to emerge. At one year distance all the contracts display significant odds of exit to open ended contracts, with the highest figure for CFLs and the lowest for apprentices and quasi subordinate workers. At larger intervals self employees and quasi subordinate should take the intermediate step of a temporary jobs, while among the employees the ordering is unchanged: CFLs, temporary jobs and apprenticeship.

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[10]Notice also that Magnac [2000] finds the opposite result; in France, training programmes are not more effective than off-the-job search in finding a permanent position.

Table 7: d(kj) from raw transition rates, two years interval

	Standard	Temporary	CFL	Apprentices	Quasi sub.	Self empl.
Standard	2.255	0.278	0.430	-0.670	-0.245	0.149
Temporary	0.892	1.564	1.036	-0.215	0.011	-0.496
CFL	2.224	0.516	2.947	-0.720	-0.248	0.267
Apprentices	0.880	-0.182	0.562	2.504	-0.896	-0.164
Quasi sub.	0.048	0.017	0.294	-1.136	2.404	0.831
Self empl.	0.417	0.067	-0.184	-1.638	0.273	4.485
From raw estimates						

Table 8: d(kj) estimates controlling for individual fixed effects, two years interval

	Standard	Temporary	CFL	Apprentices	Quasi sub.	Self empl.
Standard	**1.73**	**0.50**	-0.14	**-0.46**	0.03	**0.55**
	0.12	0.16	0.23	0.21	0.36	0.27
Temporary	**0.70**	**1.64**	0.56	**0.71**	0.80	-0.41
	0.16	0.21	0.32	0.33	0.43	0.52
CFL	**1.44**	**0.89**	**2.31**	0.11	-0.53	0.76
	0.19	0.30	0.53	0.44	0.77	0.48
Apprentices	**0.33**	0.35	0.56	**2.01**	-1.02	-0.53
	0.17	0.25	0.37	0.21	0.65	0.43
Quasi sub.	0.19	**0.66**	0.90	0.24	**1.46**	**1.04**
	0.28	0.32	0.70	0.65	0.34	0.38
Self empl.	0.39	**0.88**	0.95	-0.26	-1.17	**3.17**
	0.29	0.39	0.67	0.75	0.78	0.30
s.e. in second rows. Bold if 95 pct significant						

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7 Discussion

In this paper we provide fresh new evidence about the role of temporary jobs as stepping stone towards permanent employment in Italy. Previous results were mainly from Ichino et al. [2005]: in a proper policy evaluation framework, they find that agency jobs represent a stepping stone to employment in Tuscany, but results are not significant in Sicily. Despite the sound methodology, their evidence concerns only two regions (Tuscany and Sicily) and one labor contract (temporary agency jobs). Picchio [2006] finds true state dependence in temporary jobs using national data, but his wide level of aggregation does not allow to distinguish among the contracts (he uses only two categories: temporary and permanent jobs) and to evaluate the port of entry hypothesis (unemployed individuals are excluded from the sample).

Using nationwide administrative data we are able to distinguish among a variety of different contracts for the first seven years after one enters the labor market. We show that individual heterogeneity matters in sorting the workers among the contracts; nonetheless, after controlling for time invariant covariates, we find evidence of both state dependence and the stepping stone hypothesis. These results still hold when transitions are computed at intervals larger than the average or legal duration of most of the contracts; moreover, averaging over the first seven years of one's career prevents any possible start up or screening period bias.

Policy implications must be evaluated carefully. Even if CFLs and, to a lesser extent, apprenticeship and temporary jobs turn out to be ports of entry, we are not in a position to say whether a further liberalization would ease the transition to permanent employment. Flexible jobs, in fact, may even substitute open ended contracts. CFLs themselves exist since 1984, far before the first strong liberalization of the Italian labor market was introduced (1997 with the "Pacchetto Treu"; see the appendix). Even more surprisingly, the most recent comprehensive reform (the "Legge Biagi" as it is commonly known) abolished such training programmes. In other words, our evidence is far from supporting a direct and positive relationship between labor contract liberalization and entry into permanent employment.

As for the econometric approach, three considerations are in order. First, we find evidence both of state dependence and of a stepping stone effect. The main question therefore become: how long does a worker take to enter a permanent job? This involves duration analysis, but, as we discussed in section five, controlling for unobserved fixed effects would become a hard task. Second, the model proposed by Magnac works out the problem of unobserved heterogeneity in a very elegant way without any distributional assumption. Nonetheless, it's not able to take into account the effect of time-varying covariates. In other words, the persistence and the transitions we still observe after controlling for fixed effects, could be due to some individual characeristics that varied in the time interval we observe. Along the lines of Magnac, Honorè and Kyriazidou [2000] propose a solution to this problem; the conditions for the identification of the coefficients of time-varying characterisitcs, however, are really data-demanding.

Finally, both Magnac and Honorè and Kyriazidou do not account for the initial conditions. In order to minimize such problem, we used a sample of entrants on the labor market; running a dynamic multinomial logit regression with unobserved components *à la* Wooldridge [2005] is possibly a good robustness check.

Duration analysis, time-varying effects and initial conditions are the issues of our ongoing research.

8 Conclusions

One of the reasons why temporary contracts have been so widely introduced in many Eurpean countries is to ease labor market entry for young workers. Evaluating whether this mechanism holds is not our purpose. We are interested in what happens in the following: are temporary jobs a port of entry towards more stable career patterns, or do they engender state dependence? Using a sample of entrants from WHIP, a large work histories dataset built up by LAB-ORatorio R. Revelli from the Italian social security administration archives, and after controlling for individual fixed effects, we find that i) heterogeneity plays a non-negligible role in sorting the workers among the contracts; ii) whatever the origin state of a worker, retaining the same contract is always the most likely destination state, but iii) this evidence of state dependence does not prevent temporary jobs, apprenticeship and mainly training programmes from being stepping stones into permanent employment. These results are robust to the average or legal duration of most of the contracts, and are not affected by possible start up period bias. The time elapsed between the entry on the labor market and the first permanent job is therefore likely to play a crucial role. Minor results say that a worker is more likely to be employed in the future if she works today and that in order to get a permanent job self employees and quasi subordinate workers should take an intermediate step, often represented by a temporary job.

9 Appendix: the institutional framework

The years 1998 - 2004 cover the period immediately after the introduction of agency contracts (Law 196/1997, also known as "Pacchetto Treu") and before another comprehensive reform (the Law 30/2003, also called "Legge Biagi") was actually implemented[11]. In the following we describe the main features of the contracts we consider, with particular concern about maximum duration, extension and repetition of temporary contracts. In general, the use of temporary contracts to substitute workers on strike is forbidden and sequences of temporary contracts face no limits provided the employer is different.

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[11] The Pacchetto Treu also included minor reforms to fixed term contracts and apprenticeship, promoted the diffusion of part-time jobs and CFLs and reintroduced probation contracts (*tirocinio*). The Legge Biagi has been actually implemented at the end of 2004.

- **Permanent contracts** can be broken through individual or collective layoffs. Individual layoffs in Italy are in general forbidden unless a just cause exists. However, the way wrongful individual layoffs are treated depends on the firm size: within large firms (more than fifteen) the employer is forced to re-hire the worker and to pay her a compensation; in small firms only a compensation is due (from twice to ten times the last wage if the worker's tenure was larger than ten years). In large firms layoffs occur mainly through collective dismissals. Since 1991 collective dismissals are admitted if i) the employer is planning to lay off at least five workers in four months and ii) either a sharp reduction or a shutdown of the activity is expected. Italian open ended contracts are therefore not so "permanent" as common knowledge often believes.

- **Fixed term contracts** were introduced in Italy in 1962. At that time they were admitted only in cases of occasional or unpredictable events. In 1978 firms operating in trade or tourism industry have been allowed to use fixed term contracts in order to face demand upturns. In 1987 collective bargaining has been entitled the definition of the cases when fixed term contracts are admitted. Their almost complete liberalization occurred in 2001. In general, there is no maximum duration for fixed term contracts. Extensions are allowed up to a total of three years, but only if the initial contract's duration is lower. Sequences of fixed term jobs are allowed if at least ten to twenty days elapse between two sucessive spells. These limitations do not apply to **seasonal activities**.

- In 1984 the **CFL** (*contratti di formazione e lavoro*, work-and-train contracts) were introduced. Through CFLs employers enjoy a sharp cost reduction (a roughly 30% rebate on the Social Security fee and no firing costs) and provide to the worker a minimum of formal training. Eligible people are workers 15 to 29 years old; the duration is 18 to 24 months and no extension is allowed. Over the years many reforms took place: in 1988 the rebate decreased to 15%; in 1991 it has been furtherly reduced to 7% in Northern and Central Italy, and to 12% in the South, where the target population was extended to 15-32 years old workers. In 1993 the eligible age became 16 to 32 years old all over Italy and the maximum duration was reduced to 12 months for professional settling. Sequences of CFLs are admitted conditional on a change in the training contents (see Contini et al. [2003] for details).

- **Apprenticeship** was introduced in Italy in the early Fifities. Similarly to the CFLs, apprentices receive a minimum amount of external and on-the-job training and the employer enjoy a sound Social Security fee reduction; formally apprenticeship is not a temporary contract. Its minimum duration is 18 months and the maximum is 4 or 5 years. Apprentices are from 15 to 24 years old, but in some cases the maximum age at hiring can be 26 or even 29. At the end of the apprenticeship period the employer either

dismiss the apprentice or retain her with a permanent contract. Sequences of apprenticeship contracts are allowed.

- **Agency contracts** were introduced in 1997 (Law 196/97, also called "Pacchetto Treu") and became effective in 1998[12]. With agency contracts the provider hires the worker either temporarily or permanently. In this last case the worker receive an attendance allowance from the provider; the share of permanent agency workers in Italy is negligible. In any case the firm pays the wage to the worker (without reductions) and a search cost to the provider (between 20% and 30% of the wage). Agency work is not allowed for low skilled or dangerous jobs and in firms where collective layoffs occurred in the previous twelve months. From 2000 agency workers can be employed in low skilled jobs too. Collective bargaining stated that the maximum share of temporary agency workers is between 8% and 13% of the number of permanent workers of the firm, depending on industry and the specific collective contract. Temporary agency contracts can be extended up to four times for a maximum of 24 months (see Ichino et al. [2003]).

- **Collaborators**. The *contratti di collaborazione coordinata e continuativa* (often referred to as co.co.co. contracts) exist in the civil code since the early Seventies but became easily observable through administrative data only in 1996, after a dedicated public security fund was introduced (Law 335/95, also called "Legge Dini"). Their main features are i) the absence of a subordinate relationship with the employer (the collaborator is formally a self-employee) and ii) a very limited social security fee (10% of the gross wage; for dependent workers it is about 33%). Initially, co.co.co. contracts were admitted only for non-manual jobs, but this limitation disappeared in 2001. Over time major reforms concerned the social security fee: for workers without any other public security fund it raised to 12% in 1998, 13% in 2000, 14% in 2002 and about 18% - 19% in 2004. Co.co.co. contracts can be extended and repeated at will; no maximum duration is imposed. For analysis purposes collaborators are splitted into several subgroups: i) non-managers without other incomes (the ones we call "quasi-subordinate") ii) managers iii) collaborators with another income whose source is either a pension or a dependent job (in these cases the other activity is assumed to be the primary) iv) collaborators with another income, whose source is unobservable (such observations are disregarded) v) collaborators with more than one employer (see Berton et al. [2005] for the details).

- **Professionals** and **self-employees**. WHIP accounts for all the professionals without an autonomous security fund, the artisans and the traders.

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[12]For this reason the share of agency workers in our sample - the flow of workers who entered the labor market on 1998 - is really small.

Since they are all proper self-employees[13], there's no room for questions about maximum duration, extensions and repetetions.

We aggregated all the observable contracts: standard means permanent contract (either subsidized or not subsidized - the large majority), temporary contracts include fixed term contracts, temporary agency contracts and seasonal workers, self-employees include artisans, traders, professionals and collaborators under points ii) and v) above. Our analysis does not distinguish between part time and full time jobs.

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[13] Some doubts on the professionals we are able to observe actually emerge, but the empirical evidence on this argument is poor.

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