Flexibility Policies in the Italian Labour Market:

Some Effects of the Treu Reform

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Preface[1]

In last two decades, countries characterized by high levels of employment protection legislation (EPL) have introduced flexibility policies, in order to reduce elevated and persistent unemployment rates. European policy makers implemented reforms "at the margin", allowing for reduced protection only for some new contractual forms (called atypical contracts), characterized by lower firing costs. In Italy the first reform "at the margin" was implemented with the introduction of the Treu Law (L. 196/97), which introduced temporary contracts and made fixed-term contracts more widely allowed, in order to make the labour market more dynamic and to decrease the unemployment rate. To best of my knowledge, my thesis represents the first attempt to evaluate the effects of the Treu Reform on the Italian labour market. It is constituted by three chapters.

The first of them consists in a survey in which I present a summary of frame-

[1]I am very grateful to my supervisor, Robert J. Waldmann, and Marcel Jansen for their suggestions and useful comments. The usual disclaimer applies.

work approaches to analyse these policies and the more important implication of them for the labour market. Theoretical studies predict and the empirical studies show that the reforms affected various dimensions of the labour markets. In general, flexibility policies seem to fail their main aims. Effects were unclear with respect to unemployment rate, they were substantially negative on career development, and an increased duality arose in terms of wage and probability of leaving unemployment.

The second and third chapters consist of two empirical frameworks that analyse some effects of the larger use of atypical contracts on various dimensions of the labour market. Both papers use micro-data for young individuals drawn from WHIP (Work Histories Italian Panel, Laboratorio R. Revelli) dataset. WHIP provides monthly information on job relationships and allow me to distinguish among three possible states: permanent contracts (PC), atypical contracts (AC), and non working state (NW).

The first paper that inquires whether the reform has affected the duration dependence related to the out-flow from non-employment, how previous atypical contract experiences affect the probability of finding a stable job and whether the probability of getting a permanent contract is higher moving from a non-working state rather than from an atypical job. Applying a Mixed Proportional Hazard (MPH) model with competing risks I estimate the hazard rates for the following state transitions: PC-PC, PC-AC, PC-NW, AC-PC, AC-AC, AC-NW, NW-PC, NW-AC. My main findings are

an increase in negative duration dependence for non-working state out-flow, meaning an amplification of the short-term unemployed - long-term unemployed duality. It is a consequence of the larger use of atypical contracts, that would provide a screening instrument for the hiring choices of firms. Previous atypical job experiences play a negative role on the probability of moving toward a stable job if the state of origin is a non-working condition, while they have a positive role in the transition toward an atypical job. There is no evidence that the probability of finding a permanent contract is higher for workers who move from an atypical contract rather than from a non-working state. Finally, a human capital accumulation effect is found to explain the transition toward a stable job.

Policy implications include promotion of longer contractual durations and facilitating training programs, during inactivity periods, in order to increase human capital accumulation. They should provide support to workers while searching for a job, contributing to reduce non-employment state durations. Finally policies are necessary above all for disadvantaged workers who have more difficulty in finding a job.

The second paper estimates the flows from an atypical contract towards a new state, evaluating the effects of the Treu Law on them. Applying a standard Multinomial Logit model I find that some personal characteristics, job duration and number of previous atypical experiences affect the transition rates. After the introduction of the Treu Law, the transitions towards an atypical job increased, both starting from an atypical

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CN # Chapter 1

CT # What do we Learn from two Decades of Flexibility Policies? A Survey on Evidences from European Countries

A ## 1.1 Introduction

Since the end of the '70s, European labour markets have been characterized by high and persistent unemployment rates. Economists agree that the high regulation and rigidity of the labour markets is a the principal reason for this phenomenon. It is obvious that

higher employment protection will tend to reduce the separation rate from employment into unemployment[1], and reduce the exit rate from unemployment into work as firms become more cautious about hiring. This will tend to reduce short-term unemployment (STU) and raise long-term unemployment (LTU). In order to solve their unemployment problems, European countries have adopted widely varying policies concerning employment protection legislation (EPL). Generally, the answer of the governments is consisted in implementation of the reform "at the margin", allowing for reduced protection, but only for some new contractual forms (atypical contracts). In fact, in economies where permanent workers have high levels of employment protection, atypical contracts (i.e. fixed-term contracts, temporary contracts, etc.) can provide a mechanism enhancing labour market flexibility, since firms can adjust their workforces by varying the number of atypical workers, characterized by lower firing costs.

In countries characterized by high levels of EPL, as France, Italy and above all Spain, over the last two decades the use of atypical contracts has increased strongly. On the contrary in countries, such as Great Britain, characterized by weak employment protection, the percentage of the workforce in atypical jobs is remained low and stable. Some evidences (see Booth, Dolado and Frank, 2002) confirm that a positive and strong

[1] Many studies show that dismissal probabilities is lower in countries characterized by higher EPL. However, as showed by Boeri and Jimeno (2005), same evidences are found in within-country analysis if EPL is not enforced uniformly across size distribution of firms. In particular they found that workers under permanent contracts in firms with less restrictive EPL are more likely to be dismissed.

correlation exists between the percentage of atypical contracts and EPL for permanent jobs. Therefore, given that atypical contracts can provide labour market flexibility, their rise in much of European countries can be seen, in part, as arising from deliberate policy.

Flexibility policies made the European labour markets more dynamic in terms of higher inflows and outflows between unemployment and employment, but an unclear effect arose with regard to aggregate unemployment rate. These policies have also affected other dimensions of the labour market, but macroeconomic evidences and growing number of analysis performed do not give univocal results on them.

Economists carried out a large number of theoretical and empirical investigations in order to provide some answers to the effects of the introduction of reform "at the margin". As surveyed in Dolado, Garcia-Serrano and Jimeno (2002), there are many theoretical models used to analyse some effects of the atypical contracts on the labour market. Each of them isolates several mechanisms through which the specific characteristics of those contracts affect the working of the labour market, but an integrated framework embedding all these different mechanisms is not yet available. The main theoretical models used are dynamic models of labor demand with adjustment costs, matching and search models, efficiency wage models and wage bargaining models. On the other side, empirical approaches are also used to analyse the effects of the introduction of atypical contracts. In particular, duration models, treatment effects

models and multinomial logit models are estimated to investigate some of the previous questions. The most studied subjects are:

1. the determinants of the share of atypical contracts in dual labour market where contracts with and without firing costs coexist;

2. the trade-off faced by the firms in paying firing costs and having stable workers, or avoiding them and having temporary workers;

3. the effects of high turnover on productivity and wages;

4. the effects of atypical contracts on workers' relative bargaining power in the distribution of the generated surplus;

5. the effects of the larger use of atypical contracts on the long-term unemployed;

6. the effects of atypical contracts on career development, and their implications for accumulation of the human capital and the probability of reaching a stable job;

One branch of the theoretical literature studying the determinants of the share of atypical contracts in dual labour market with and without firing costs use the dynamic models of labor demand with adjustment costs, and include studies of Bentolila and Bertola (1990), Bertola (1992), Bentolila and Saint-Paul (1992), Bertola and Ichino (1995) Risarger and Sorensen (1997) and Dolado, Garcia-Serrano and Jimeno (2002). Mortensen and Pissarides (1994), Wasmer (1999), and Cahuc and Postal-Vinay (2002),

analyse the effects of atypical contracts on unemployment using matching and search frameworks. Efficiency wage models provide a natural framework to analyse the atypical contracts when they are used in jobs where stable labour relations are an important source of efficiency. Saint-Paul (1996) and Güell (2000) provide some interesting applications of them. Finally, Bentolila and Dolado (1994) and Jimeno and Toharia (1993) provide two applications of a collective bargaining model on wage determination to derive the effects of the coexistence of permanent and atypical employees on bargained wages. Blanchard and Landier (2002) develop a macroeconomic model to analyse the effects of a partial reform of employment protection.

In the most recent years, a number of analysis have been performed in order to support the main theoretical predictions and to provide empirical evidences. Maia Güell (2003) uses a duration model for cross-sectional data to investigate the effects of the Spanish labour market reforms on the probability of leaving unemployment. Holmlund and Storrie (2002) estimate a time series models for transition rates and use the estimated equations to simulate the labour market responses to an adverse macroeconomic shock in order to explain the remarkable rise in temporary work that has taken place in Sweden during the 1990s. Many studies concern the effects of flexibility policies on different aspects of the career development. Alba-Ramirez (1998) and Amuedo-Dorantes (2000) apply a multinomial logit specification to study labour force transitions of atypical workers, in order to determine if atypical jobs constitute a trap

or a bridge to permanent employment. Also van den Berg, Holm and van Ours (2002), Booth, Francesconi and Frank (2002), and Zijl, van den Berg and Heyma (2004), investigate if the atypical contracts provide a stepping stone effect toward a permanent work, using different versions of duration models for panel data. Ichino, Mealli and Nannicini (2005) study the same issue using an average treatment effect model. Güell and Petrongolo (2006) explore the duration pattern of fixed-term contracts and the determinants of their conversion into permanent ones, estimating a duration model for temporary employment, with competing risks. D'Addio and Rosholm (2005) look at the determinants of the transitions out an atypical job applying a multinomial logit model with random effects. Gagliarducci (2005) use a mixed proportional hazard model allowing for multiple states, to study the effect of repeated atypical contracts on the probability of finding a permanent job. Hernanz et al. (2005) try to shed further light on transitions made by workers in Italy and Spain from temporary to stable employment. The analysis focuses on a comparison of involuntary atypical workers, with both other atypical workers and the unemployed. Finally, other studies concern the effects of atypical contracts on employment, wages, productivity, and so on. Pacelli (2006) uses a difference in differences (DID) estimator, and she investigates whatever the flexible labour force might influence adjustment decisions regarding the rigid part of the labour force. Nannicini (2004a, 2004b) exploits, in two different papers, the available evidence in order to shed light on the take-off of atypical employment in Italy, and the

effect of production volatility on the duration of atypical works. Davia and Hernanz (2002) study the determinants of wage differentials between atypical and permanent jobs. Aguirregabiria, and Alonso-Borrego (1999) estimate a dynamic labor demand model with indefinite and atypical labor contracts in order to evaluate the effects on employment, job turnover and productivity of a labor market reform in Spain that eliminated dismissal costs for atypical contracts. Alonso-Borrego, Fernandez-Villaverde and Galdon-Sanchez (2005) build a general equilibrium model with heterogeneous agents and firing costs and calibrate it to Spanish data in order to analyse the quantitative effects of atypical contracts on the economy.

In section 2 I summarize reforms and the development of atypical contracts legislation in some European countries characterized by high EPL. Section 3 is devoted to describe the major findings of the studies mentioned above. In section 4 I briefly introduce the new directions of labour market policies implemented to correct distortions arise by flexibility strategies. Finally I present some conclusions on discussed policies.

A

1.2 Some reforms in European countries

In this section I briefly describe the more important reforms "at the margin" implemented in the European countries characterized by high employment protection legislation. Spain was a pioneer at introducing atypical contractual forms and it has become a significant example for other UE countries. Italy and France managed later to imple-

ment these reforms, and at the moment atypical jobs are still not widespread compared with Spanish labour market.

1.2.1 Spain

Franco's economic system was paternalistic and based on low labour cost in exchange for secure employment. The legislation of trade unions[2] and the restoration of a proper collective bargaining system between employers and workers in the late 1970s gave rise to a strong increase in the bargaining power of the worers in wage setting. At the same time, those changes were not accompanied by a reduction of EPL since it was feared that such a reform could endanger the smooth political transition to democracy. Thus, the main characteristics of the Spanish labour market were a high degree of employment protection both against dismissal and functional and geographical mobility.

The Workers' Statute of 1980 gave some legal structure to the post-Franco labour market. However, employment guarantees were consolidated rather than modified. As unemployment soared, wage moderation obtained by economy-wide agreements between government, employer organizations, and labour unions was not enough to stop labour shedding. Sluggish job creation prompted the government to reform the Workers' Statute in 1984. The first reform encouraged the use of atypical contracts for regular activities and, in contrast with permanent contracts, entailed much lower severance

[2]Trade unions were banned under the General Franco's dictatorship.

payments and their termination could not be appealed to labour courts. The reform implemented in Spain was far more liberal than that of the other European countries. In particular, while in some countries ACs were restricted to particular types of workers or sectors, there was no such restriction in Spain. In fact, all workers in all occupations and sectors could be hired under an AC. The effects were very strong. Before the 1984 reform, atypical contracts were only allowed for seasonal jobs, and about 94% of workers were employed with a permanent contract. A decade after the introduction of the 1984 reform, the share of the ACs employees had become the highest in Europe, around 33 percent, while the European average was 11 percent, and the share of atypical job in hiring has increased from 12% to 96%.

In the 1990s, by contrast, reforms were aimed at undoing the liberalisation of 1984 and reducing the incidence of atypical employment. In 1994, the conditions for 'fair' dismissal of workers under permanent contracts were relaxed, while conditions for the use of atypical contracts were restricted. In 1997, the government reach an agreement with the social partners (i.e. the employers' confederation and unions), and introduced the so called "permanent employment promotion contract". This new permanent contract was heavily subsidized and entitled to lower firing costs than ordinary PC's in case of unfair dismissal. The first reform promoted the use of permanent contracts to hire 18-29 years old, long-term unemployed adults, disabled persons. It reduced the atypical contracts; it promoted combined theoretical and practical edu-

cation among the young to facilitate their entry into the labour market. In 2001 the government extended the new PC to more population groups, increased the subsidies and subsidizes the conversion of AC's into PC's[3].

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1.2.2 Italy

In Italy, atypical contracts are regulated by numerous laws introduced since 1955, when the first regulation related to apprenticeship contracts was established. In 1962 fixed-term contracts used for seasonal jobs and to substitute absent workers were introduced. This regulation was modified in 1983 and 1987. In 1984 the CFL (on the job training contracts) were introduced in order ease entry into the labour market. Like the fixed-term contracts they have a determined duration: one year in order to acquire low qualifications and two years in order to acquire high qualifications. The CFL legislation was modified in 1987, by a law which extended their applicability to all economic sectors, and in 1994, by a law which raised from 29 to 32 the age limit for their applicability. As described above, for about forty years the legislation of the atypical contracts in the Italian labour market was characterized by the introduction of several laws that yet have left the use of these contractual forms at the margin. Finally, in 1995 the Coordinate

[3]See, in example, Jimeno and Toharia (1993) Alba-Ramirez (1998), Cebrián, I. et al. (2001), Dolado, Garcia-Serrano and Jimeno (2002), Kugler, Jimeno and Hernanz (2005), Arellano (2005) and Trevisan (2006).

and continuous collaboration (Co.Co.Co) contracts were introduced. Workers hire as Co.Co.Co. is self-employed presenting specific relationship with the company featuring.

Only in 1997 a large reform was implemented , the Treu Law, in order to bring flexibility and dynamism to the Italian labour market. The main novelty of the reform consisted in the introduction of temporary contracts (without age limitation for hired workers) and in the creation of Temporary Work Agencies, so that job centres were privatized and decentralized[4]. The reform also modified the statutory discipline of fixed-term contracts and changed the apprenticeship relationships. Finally, it extended the CFL applicability for depressed areas and for individuals with invalidity, and it raised from 22 to 24 the age limit for apprenticeship contracts. After the introduction of the Treu reform, the percentage of the workforce in atypical jobs increased from 7.5% to 10% (see table 1) in a few years, then it stabilized.

In 2003 a new reform (known as Biagi Law) was introduced in the Italian labour market. The purpose of the Biagi Law was to increase in a few years the employment rate in the belief that development must be accompanied by the ability to create additional workplaces. The law has introduced new contractual forms and has innovated some existing ones, affecting mainly subordinated jobs. In the job on call contract, the workers are available for employers for intermittent job services. It can be

[4]TWA employment represents a triangular contract, in which an agency hires worker for the purpose of making him available for a client firm for a temporary assignment.

permanent or not. In job sharing contract two workers commit themselves to carry out a single job, and both are responsible to do the complete work. Major innovations concerned apprenticeship and contracts of training and employment. New apprenticeship contracts provide three different types. The first relates to the straight-dust of education and training. The second relates to the attainment of a qualification by job training and technical-professional learning. The third is used in order to obtain a certificate or for high-training paths. The CFL contracts are substituted, with the exception of public administration, by the insertion contracts. They are fixed-term contracts with a duration ranging between 9 and 18 months. It aims at easing workers' integration or reintegration by an adaptive path of professional competences. Finally, the Biagi law has changed the Co.Co.Co contracts, substituting them with the Co.Co.Pro. relationships, in which workers are put into a specific project or plan[5].

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1.2.3 France

In France, atypical contracts were introduced in 1979. In 1982 their scope was reduced, according 12 conditions and only under them could firms use atypical contracts. In 1986, the 12 conditions were replaced by a general rule: ACs should not be used to fill a permanent position in the firm. The most recent architecture dates for the most part to an agreement signed in 1990. Under this agreement, ACs can be offered by firms for

[5]See in example Cebrián, I. et al. (2001).

only one of four reasons: the replacement of an employee on leave, temporary increases in activity, seasonal activities, and special contracts, aimed at facilitating employment for targeted groups, from the young to the long-term unemployed.

The list of special contracts has grown in the 1990s, as each government has tried to improve labour market outcomes for one group or another; some of these contracts require the firm to provide training, and many come with subsidies to firms. Atypical contracts are subject to a very short trial period, typically one month. They have a fixed duration, from 6 to 24 months depending on the specific contract type. They typically cannot renew and, in any case, cannot be renewed beyond 24 months. If the worker is kept, s/he must then be hired on a regular contract. If the worker is not kept, s/he receives a severance payment. Besides, the law states that the wage paid to a worker doing the same job under a permanent contract, and, when AC ends, workers qualify for unemployment benefit[6].

1.3 Theoretical and empirical evidences from European labour markets

This section is devoted to review the main findings of theoretical and empirical studies performed on flexibility policies in Europe. As in Dolado, Garcia-Serrano and Jimeno

[6] See, in example, Blanchard and Landier (2002), Cahuc and Postel-Vinay (2002).

(2002), that briefly discuss theoretical approaches, highlighting some of their relevant implications, I report the predictions of theoretical model and emphasize evidences from empirical frameworks, underlining positive and negative effects deriving from the use of atypical contracts.

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1.3.1 Theoretical Predictions

Dynamic models of labor demand with adjustment costs provide the basic tool to analyse the determinants of the share of atypical jobs in dual labour market characterized by contracts with and without firing costs. As pointed out by Bertola and Ichino (1995), since the marginal revenue of hiring a permanent worker is below its shadow wage in a bad state of the economy, and it is above its shadow wage in a good state, a standard result in this literature is that the existence of firing costs implies fewer job terminations in the bad state and less job creation in the good state, with lower transitions between employment and unemployment. To the extent that atypical jobs entail no redundancy pay, both their creation and destruction rates will be higher than those of permanent jobs in an upturn and a downturn, respectively. Follow that the ratio of atypical to permanent jobs, will increae in good states and fall in bad states. However, the effects of firing costs on aggregate employment are substantially ambiguous, since employment is moving in the opposite directions both across types of contract and states. If, as in Bentolila and Bertola (1990), we consider the particular case in which there are no

atypical contracts and a linear marginal revenue function, predict that a reduction in firing costs may reduce average employment. On the other hand, Bertola (1992) find that for more general functional forms of the revenue function than the one considered above, the previous result no longer holds and the effects of firing costs on average employment are ambiguous. However, as showed by Risarger and Sorensen (1997), when these partial equilibrium models are extended to include investment decisions by the firm, it is often the case that firing costs lead to lower investment[7] which, in turn, decreases labour demand, for a given level of capital stock, inducing an employment reduction.

Matching and search frameworks analyse the effects of atypical contracts on unemployment. One stream of this literature, assumes that firms can create both permanent and atypical jobs, the latter being necessarily terminated when they expire, and that separation rates for both types of workers are exogenous. Another stream of this literature, make the separations rates endogenous by assuming that productivity depends on a match-specific component, that may change with the duration of the unemployment spell, so that there is an endogenously determinated productivity threshold below which separations are triggered. Wasmer (1999) follows the first class of model specification, focusing on the effects of exogenous productivity growth on the ratio between the vacancy and the unemployment rate (tightness), and on the share

[7] An unambiguous result is that lower firing costs increase average profit across states.

of atypical jobs. The main results are that, under the assumption that unions are not too powerful, the basic implication of this model is that, in period of high growth, the proportion of atypical contracts will be smaller while the unemployment rate will drop for a similar level of vacancies. On the contrary, when unions are very powerful the opposite happens. Cahuc and Postel-Vinay (2002) follow the second stream of the literature, along the lines of Mortensen and Pissarides (1994). Their model, facilitating the use of atypical contracts, by increasing the rate of approval, increases the three interdependent productivity thresholds[8] and the overall tightness in the labour market. They show that if the firing costs are sufficiently high, a less restrictive legislation on atypical contracts, despite fostering job creation, might increase job turnover in the non-permanent jobs, by so much that it may end up leading to an increase in unemployment. Thus, one of the main implications of this model is that trying to achieve a more flexible EPL through spreading atypical contracts without a parallel reduction of high firing costs for permanent employees is likely to be an inefficient policy in terms of fighting unemployment.

Efficiency wage models provide a natural framework to analyse why atypical contracts are used in jobs where stable labour relations are an important source of efficiency. Güell (2000) presents an application of the shirking efficiency wage model to

[8] Cahuc and Postel-Vinay model provide for three productivity threshold under which jobs are destroyed, because the first period in a permanent contract is taken to be a qualifying or probationary one entailing no severance payment at its termination if the firm decides to destroy the job.

a labour market where firms can offer permanent contracts and atypical contracts, and allowing for possibility of conversion into permanent contracts at their termination. Workers decide each period whether to shirk or not to shirk, and if they are found shirking, a permanent worker is dismissed and becomes unemployed whereas an atypical worker does not have his contract renewed. Güell (2000) argues that if the probability that the dismissal may be declared unfair, is not too high, allowing for atypical contracts can increase employment, as long as the renewal rate is sufficiently high so as to provide atypical workers with an incentive to avoid shirking. Thus, countries where there is a vague distinction among the different types of dismissal will tend to have lower renewal rates and a higher proportion of atypical contracts. Saint-Paul (1996) argues that atypical contracts can have a positive effect on effort if workers perceive that the rehiring probability depends on past performance. Furthermore, if the rate of renewal is low, firms and workers under atypical contracts will tend to receive less training. Due to this hold-up problem, firms might find an appropriate to pay some firings costs, although not too high, as a commitment device to maintain a certain degree of job stability.

Collective bargaining model are applied to derive the effects of the coexistence of permanent and atypical employees on wages determination. Jimeno and Toharia (1993) presented a bargaining model with both permanent and atypical workers, assuming that workers' representatives in collective bargaining only care about the utility of permanent workers. They showed that the total effect of atypical employment on

bargained wages depends crucially on how atypical workers' wages are determinated. They argue that the wage of atypical workers is bound to be related to the wages of permanent workers and that there is a buffer effect of atypical employment on bargained wages. Finally, permanent workers' bargained wages will be higher when atypical contracts are introduced than when firms cannot hire atypical employees. Also Bentolila and Dolado (1994) suggest that if unions are dominated by worker under permanent contracts subject to high firing costs, and they set wages for all workers, then the existence of atypical contracts increases their bargaining power. Thus, insofar as the existence of flexible jobs with no firing costs provides a buffer against the negative effect of wages rises on their employment probability, wages of permanent workers will be higher, the higher the share of atypical contracts is. However if firms can pay lower wages for employers under atypical contracts, then that may compensate for the buffer effect and overall labour costs fort he firm may not change or even decrease as the proportion of atypical contracts increases.

B

1.3.2 Empirical Evidences

A large number of empirical studies are carried out to support the main theoretical predictions and to underline some findings. Maia Güell (2003) estimates a parametric duration model using cross-sectional data in order explore the possibility that atypical contracts implied longer duration of unemployment for the long-term unemployed even

while it lowered the incidence of LTU due to increased (average) outflow rate. She finds that the relative probability of leaving unemployment for the short term unemployed versus the long term unemployed increased significantly after the introduction of atypical contracts. Besides she argues that the limited success of flexibility measures in reducing unemployment could be linked to the fact that atypical contracts have not helped to reduce the duration dependence in unemployment. Holmlund and Storrie (2002) estimate a time series models for transition rates and use the estimated equations to simulate the labour market responses to an adverse macroeconomic shock, focusing in particular on atypical and permanent employment. They have found, contradictting the theoretical predictions, that a recession is associated with relatively more hirings on atypical contracts, presumably reflecting stronger incentives on the part of firms to offer short-term jobs when workers are easier to find as well as an increased willingness on the part of workers to accept atypical work when job offers in general are in short supply. Many of more recent research concerns career development and the effect of atypical job experiences on the probability of reaching a permanent job. However, the evidence is not univocal as to whether atypical jobs are more likely a trap than a stepping-stone to permanent employment. Alba-Ramirez (1998) studies labour force transitions of atypical workers applying a multinomial logit model. He finds that if atypical workers lack any attachment to the firm, they are less likely to receive training than permanent workers, making them more prone to continue atypical employment

relationships. A similar conclusion is found by Amuedo-Dorantes (2000). The multinomial logit estimates and the baseline survivor and hazard functions all indicate that atypical work is more likely to become a trap than a bridge to permanent jobs regardless of workers' tenure. On the other hand, Booth, Francesconi and Frank (2002) find that, even if atypical workers report a lower levels of job satisfaction, receive less work related training than their counterparts in permanent employment and receive lower wages, atypical jobs are a stepping stone to permanent work[9]. Ichino, Mealli and Nannicini (2005) measure to what extent Temporary Work Agency (TWA) employment can create a "springboard" toward permanent jobs, or a "trap" of endless precariousness. Applying Propensity Score matching in the presence of choice-based sampling, they estimate the causal effect of the treatment "TWA assignment" on the outcome "finding a permanent job after 18 months", showing that a TWA assignment can increase the probability of finding a permanent job. van den Berg, Holm and van Ours (2002) and Zijl, van den Berg and Heyma (2004) also study if atypical jobs provide a stepping stone effect toward a permanent work. Availability of multiple spell data, allow them to use a multi-state duration model, applying the 'timing of events' approach. It is useful in the sense that fewer assumptions are needed for identification, and therefore the empirical results are less sensitive to aspects of the model specification (see van den Berg, 2001). Their results highlight that atypical jobs serve as stepping-stones towards

[9] This evidence is found for fixed-term contracts but not for seasonal-casual jobs.

regular employment. Gagliarducci (2005) also apply time-event analysis to atypical employment, in order to investigate the effect of repeated atypical contracts on the probability of finding a permanent job. He argues that good matches are converted into permanent contracts immediately after the initial screening, while for longer contracts the probability of being converted first increases, and then decreases over time. Besides, and more importantly, people experiencing repeated atypical contracts, and especially interruptions, have a lower probability of finding a stable job. This finding seems to suggest that it is not temporary employment per se, but the intermittence associated with it that is detrimental to employment prospects. Güell and Petrongolo (2006), estimate a duration model for temporary employment, with competing risks of terminating into permanent employment versus alternative states, and flexible duration dependence. They found that a pronounced spike at three years of duration, suggesting that some fixed-term contracts are only converted into permanent ones when there is no other way to retain the worker. Second, there is a spike around one year of duration, which supports the idea that some of these contracts are also used as a screening device. Workers who successfully pass the screening may obtain a permanent renewal much before the legal duration limit of their contracts. Finally, D'Addio and Rosholm (2005) look at the determinants of the transitions out of atypical job applying a discrete time duration model. Specifically, they use a multinomial logit model (with and without random effects) distinguishing between exits into permanent employment and

non-employment. Their main findings are: first, some factors[10] affect workers reducing the probability of job stability and symmetrically by increasing that of job instability. Second, disadvantaged workers[11] are at higher risk of exclusion. Third, unobservables play an important role in determining workers outcomes especially for women. Fourth, the duration dependence parameters suggest that very short contracts are associated with higher risks of labour market exclusion, especially for men.

However, other topics were also investigated in order to analyse various implication of flexibility policies. Econometric analysis carried out by Nannicini (2004a) confirms that productivity volatility positively affects contracts length and the shortage of alternative employment opportunities negatively affect contract lenght. In another paper Nannicini (2004b) finds the utilization of temporary contracts appears to be positively correlated with production volatility, and that industries that have used temporary jobs more intensively experienced a drop in their share of total permanent employment. His findings support the idea that the take-off of temporary employment in Italy was essentially demand driven. Some studies investigate the effects of the coexistence of permanent and atypical employees on wage determination. Jimeno and Toharia (1993) find that wage increases are higher in those sectors with higher

[10] i.e. previous non-employment experiences, unemployment rate, being occupied in some elementary tasks, and having a temporary job in the public sector.

[11] Disadvantageous workers are: older people, less experienced workers, individuals earning very low wages and women with young children.

proportions of atypical employees and those atypical employees earn lower wages than permanent employees. Davia and Hernanz (2002) study the determinants of wage differentials between atypical and permanent jobs. Their results show that wage differentials between temporary and permanent workers are explained by the differences in the distribution of personal and job characteristics in both groups, but not by differences in the rewards to those characteristics.

Aguirregabiria, and Alonso-Borrego (1999) estimating a dynamic labor demand model with permanent and atypical labour contracts, evaluate the effect of a labour market reform in Spain. They find its effects on productivity and the value of a firm is negligible. This contrasts with the sizeable increases in output and value under a hypothetical reduction in firing costs for all type of contracts. Compared with this alternative reform, the introduction of temporary contracts leads to excess turnover and employment of workers with low firm-specific experience. Alonso-Borrego, Fernandez-Villaverde and Galdon-Sanchez (2005) build a general equilibrium model with heterogeneous agents and firing costs and calibrate it to Spanish data in order to analyse the quantitative effects of atypical contracts on the economy. They find that atypical contracts increase unemployment, reduce output, and raise productivity, while the welfare effects are ambiguous. Finally, in a recent paper, Pacelli (2006) investigates as the flexible labour force might influence adjustment decisions regarding the rigid part of the labour force. Using DID analysis she finds that firms react to shocks adjusting

organisation and output on intensive margins in the short run, and more rigid stocks on extensive margins later on. Her results also may provide indications on the potential effects of more recent reforms aimed at generating a less costly flexible labour force.

A

1.4 New flexibility policies in European labour markets

Until the middle of the nineties all the reforms introduced in the Western European countries, attempted at increasing flexibility through the liberalization of temporary contracts. These reforms are called "reforms at the margin" because they generally fail to introduce a fundamental liberalization. Instead, they may increase the wages of permanent workers (as a consequence of the creation of a dual labor market), having some undesirable consequences for career of workers, output, employment, segmentation of labor market and, finally, job security.

Since 1994 in Spain the high percentage of temporary workers and the high turnover determined a pressing need for combining flexibility and security, and some reforms was implemented. So, in 1994, the conditions for 'fair' dismissal of workers under permanent contracts were relaxed, while conditions for the use of atypical contracts were restricted. In 1997, the government introduced the so called "permanent employment promotion contract". New permanent contract was heavily subsidized and

entitled to lower firing costs than ordinary PC's in case of unfair dismissal. The first reform promoted the use of permanent contracts to hire 18-29 years old, long-term unemployed adults, disabled persons; it reduced the atypical contracts; it promoted combined theoretical and practical education among the young to facilitate their entry into the labour market[12]. In 2001 the government extended the new PC to more population groups, increased the subsidies and subsidizes the conversion of AC's into PC's.

The 1997's reform had a key role in Spanish labour market, because it represented the first attempt of the Spanish government to correct the distortions of the labor market, due to the large increase in temporary contracts of the previous years and, at the same time, to introduce new elements of flexibility, reducing the dismissal costs for permanent contracts. Therefore it, in contrast to the majority of the reforms introduced in the Western Europe in the nineties, it was not a reform "at the margin". In fact, instead of introducing further elements of "pure" flexibility, it tried to increase the use of permanent contracts by reducing to costs of firing and payroll taxes[13].

In recent years, some economists have considered the impact of these reforms.

[12]Some of the main incentives introduced by the government were: The reduction of social security contributions; the reduction of dismissal costs during a period of two years for new permanent contracts; the limitation of the number of fixed-term contracts that can be offered; the introduction of new training policies.

[13]See Trevisan (2006) for an accurate explanation of incentives of 1997's reform.

Kugler, Jimeno and Hernanz (2005) exploit the fact that recent reforms apply only to certain demographic groups to set up a natural experiment research design to study the effects of contract regulations on employment levels and worker flows. They find that the reduction of payroll taxes and dismissal costs increased the employment of young and older men on permanent contracts. The results suggest a moderately elastic response of permanent employment to non-wage labor costs for young men and a less elastic response for older men. Consistent with both dismissal cost and payroll tax effects, they also find large positive effects on the transitions from unemployment and temporary employment into permanent employment and moderate positive effects on the transitions from permanent employment to non-employment for young and older men.

Trevisan (2006) applies a propensity score matching DID estimator to investigate the impact of the introduction of new restrictive permanent contracts on the perceived job security of the workers in Spain. The introduction of these new restrictive permanent contracts with lower firing costs and payroll taxes produces a double effect. On one side, the probability to be hired with a permanent contract is higher. On the other side, it becomes easier to be fired. She found that the perceived job security is strongly influenced by the characteristics of individuals and their distribution within the groups. Besides, she found that 1997's reform has a negative impact on the perceived job security of the workers belonging to almost all the target groups, with a

particular strong effect for the older workers.

Finally Arellano (2005) analyses the effects on unemployment and the quality of employment of the Spanish labour market reform in 2001 for the most important age groups, using a sample of unemployed workers in the region of Madrid. The reform's measures are concentrated on the reduction of payroll taxes paid by firms and a permanent contract with lower firing costs. This reform, which can be classified as "carrot" of job assistant, also is called "at the margin" because their measures are available only for some specific groups. The results from the DID estimator confirm partly this idea when the transition from temporary to permanent employment excluding conversions are studied. Firms may prefer to generate new permanent contracts instead of transforming temporary contracts into permanent ones if there is a clear economic expansion. The estimates suggest nevertheless that the reform does not constitute a powerful instrument to change temporary contracts into permanent contracts.

A

1.5 Conclusions

Economists consider high levels of employment protection as an important reason for elevated and persistent unemployment rates, showed in some European countries since the end of the '70s. So, in last two decades, European policy makers implemented policies aimed to make labour markets more flexible. However, they merely executed reform "at the margin" allowing for reduced protection, but only for atypical contracts.

Effects on labour market were contrasting. On one side they became more dynamic in terms of higher inflows and outflows between unemployment and employment. On the other side, given that low firing costs are allowed only for atypical contracts, a reduced job creation arose and job turnover in the non-permanent jobs increased. More important consequences were an unclear effect on unemployment rates and a substantially negative effect on career development. In particular, empirical findings evidence that repeated and intermitted atypical job experiences prevent human capital accumulation and reduce both the probability of finding a stable job and workers productivity. On the contrary, atypical jobs seem to provide a stepping stone effect toward a stable employment in case of a continue atypical relationship. The probability of moving toward a permanent job increases with work duration, i.e. with the accumulation of human capital. Finally, introduction of the reforms "at the margin" increases duality in terms of wage rates and probability of leaving unemployment. In fact, they allow both for lower wage rates for atypical jobs, mainly due to the reduced bargaining power of atypical workers, and for a decreased probability of finding a stable job for long-term unemployed because, in presence of higher job turnover, to be long-term unemployed appear as a signal of low productivity. Resuming, reforms "at the margin", because of their own partiality in reduce firing costs, seem to fail their main aims. The effects on unemployment are unclear and negative consequences appear more important than positive ones, creating some bias in labour markets and increasing duality between

workers. New flexibility policies, such as those implemented by Spanish policy makers applied to certain demographic group, provide for reduce duality between atypical and permanent employment, promoting hiring with permanent contracts characterized by reduced firing costs. The first studies show increased turnover also for permanent workers, but an unclear effect emerges with respect to the change of atypical contracts into permanent contracts. Besides, the new restrictive permanent contracts have a negative impact on perceived job security.

CN # Chapter 2

CT # Making the Italian Labor Market More Flexible: An Evaluation of the Treu Reform

A ## 2.1 Introduction

Since the end of the '70s, the European labour market has been characterized by high and persistent unemployment. A broad consensus exists among economists to consider the high regulation and rigidity of the labour market an important reason for this phenomenon. It is obvious that employment protection will tend to reduce the separation rate from employment into unemployment, and reduce the exit rate from

unemployment into employment as firms become more cautious about hiring. In order to solve the unemployment problem, European countries have adopted a variety of policies concerning employment protection legislation (EPL). Generally, the answers of Governments has consisted in implementing reforms "at the margin"[1], allowing for reduced protection, but only for some new contractual forms (atypical contracts). In fact, in economies where permanent workers have high levels of employment protection, atypical contracts (i.e. fixed-term contracts, temporary contracts, etc.) can provide a mechanism enhancing labour market flexibility, since firms can adjust their workforce by varying the number of atypical workers, characterized by lower firing costs. Flexibility policies made the European labour markets more dynamic in terms of higher inflows and outflows between unemployment and employment, but have an unclear effect on the aggregate unemployment rate. Besides, these policies have also affected other dimensions of the labour market, but macroeconomic evidences and growing numbers of analysis do not provide univocal results (see Dolado, Garcia-Serrano and Jimeno, 2002,

[1] In countries characterized by high levels of EPL, as France, Italy and overall Spain, over the last two decades the use of atypical contracts is strongly increased. On the contrary countries, as Great Britain, characterized by weak employment protection, the percentage of the workforce in atypical jobs is remained low and stable. Some evidences (see Booth, Dolado and Frank, 2002) confirm that a positive and strong correlation exists between the percentage of atypical contracts and EPL for permanent jobs. Therefore, given that atypical contracts can provide labour market flexibility, their rise in much of European countries can be seen, in part, as arising from deliberate policy.

for a survey).

Spain is a well documented example of this phenomenon; the introduction of temporary contracts goes back to 1984 and the use of these contractual forms has increased during the last twenty years. Today more than thirty percent of the contracts existing in Spain are temporary contracts, and about ninety percent of the new contracts stipulated are of the non-permanent type. The effects on the unemployment rate were positive above all in the first year of the introduction of the reform, and a more dynamic labour market was developed, with an increase of gross flows between unemployment and employment (cfr.Güell). However, the introduction of fixed-term contracts has generated some effects on other dimensions of the labour market. For example, Maia Güell (2003) shows that these reforms have increased the duration dependence for unemployment spells, creating increased duality between short-term unemployed (STU) and long-term unemployed (LTU). As shown by Blanchard and Diamond (1994), if firms rank unemployed workers and hire those with the shortest spells of unemployment, then the exit rate from unemployment is a decreasing function of duration. Moreover to the extent that firms do not hire randomly, it is quite possible that duration dependence of unemployment might have increased after the introduction of temporary contracts. Furthermore, as showed by Maia Güell (2003) considering an extreme situation in which only certain key individual characteristics (e.g. age, gender, qualification, etc.) make unemployed workers more likely to be re-employed. An analogous ranking model

based on characteristics maintain these advantages, they continue to have a higher re-employment probability when they return to unemployment after their temporary contracts finish.

Another important point here discussed considers the effect of previous atypical contract experiences on the probability of moving toward a stable job. Some studies related to the Spanish labour market, Alba-Ramirez (1998) and Amuedo-Dorantes (2000), show that the probability of obtaining a permanent contract decreases after some previous atypical contracts. On this topic, Maia Güell and Barbara Petrongolo (2006) find that the conversion rate from temporary to permanent contract is rather low and concentrates close to the deadline of the temporary contract. In the context of the European labour market, Zijl, van den Berg and Heyma (2004), van den Berg, Holm and van Ours (2002) and Booth, Francesconi and Frank (2002), show that the temporary contract provides a stepping stone effect toward a permanent job. D'Addio and Rosholm (2005) found that larger contract duration increases the probability of reaching a stable job and decreases job instability.

In Italy, the introduction of atypical contracts has been the outcome of numerous laws (see table 1) that yet have left the use of these contractual forms at the margin, at least before the introduction of the Treu Law (L. 196/97) and subsequently of the Biagi Law (L. 30/03).

In this paper I analyze the effects of the introduction of the Treu Law. This

reform has introduced temporary contracts (or interim contracts), in addition to some modifications in order to extend and to improve the fixed-term contract regulations (in particular CFL and apprenticeship contracts). The reform has been introduced in years which the Italian labour market was characterized by its highest unemployment rate. Generally, the reform has involved a partial increase of the prevalence of atypical contracts (between 1997 and 1999 the stock of atypical contract has increased by about 20%, see table 2), making the labour market more flexible and contributing to increased employment growth and to a reduced unemployment rate (see table 2). The data show that the number of atypical contracts has increased by about forty percent, going from twenty to thirty percent of total contracts (table 3).

The growth of atypical contract opportunities, in addition to the effects on employment growth and on the unemployment rate, can affect other labour market dimensions. In particular, some recent studies, by Gagliarducci (2005) and Ichino, Mealli and Nannicini (2005) on the Italian labour market, show that the atypical contract experiences can affect the probability of reaching a permanent contract. Gagliarducci (2005), in a pre-reform study, shows that the probability of obtaining a permanent contract increases with temporary contract duration, but decreases with the number of temporary contract experiences, especially if interrupted by unemployment spells. In another study, related to the post reform period, conducted using Temporary Work Agencies (TWA) data, Ichino et al. (2005), find that TWA employment creates a

"springboard" toward permanent jobs, where the TWA jobs are considered as treatment assignment.

The aim of this paper is to address questions linked to the Italian labour market reform, introduced by the Treu Law. The most interesting aspect of this work depends on the availability of data on pre and post reform period. In particular, here I consider whether:

1. Duration dependence related to the non-working spells has changed after the introduction of the Treu Reform;

2. Atypical contract episodes in individual work histories affect the probability of obtaining a stable job;

3. An atypical contract provides a stepping stone effect toward a permanent contract.

To the best of my knowledge, this is the first attempt to evaluate a reform "at the margin" in the Italian labour market (for example Gagliarducci, 2005, investigate the effect of atypical contracts in the pre-reform period and Ichino et al., 2005, in the post-reform period), and to evaluate changes in duration dependence using panel data (Maia Güell, 2003, uses cross-sectional data). Therefore, the first contribution concerns the effects of the reform on the duration dependence. These effects are directly correlated with the increase of the availability of atypical contracts that is characterized by an increase in both inflows and outflows between unemployment and employment.

From a theoretical point of view, I predict an increase of the duration dependence, with consequent amplification of the duality between STU and LTU. In a rigid labour market, with few job opportunities, long-term unemployment may not be an indicator of low productivity. On the contrary, in a more flexible labour market, characterized by more probabilities of finding a job, long-term unemployment can be an important signal of low productivity, which firms can use in order to select potential employees. In other words, this would lead to a decrease in STU's, and to a reduction in LTU's probability of leaving unemployment. Given these considerations, if the empirical analysis confirms this prediction, we can conclude that the larger use of atypical contracts would provide a screening instrument for the hiring policy of firms. At the same time, we can also conclude that the increased duality between STU and LTU would require specific job policies in order to provide suitable training for unqualified workers.

With respect to the probability of obtaining a stable job, a negative effect is probably played by previous atypical contract experience. In fact, employment in an atypical contract followed by unemployment can be interpreted as an indicator of bad qualities of the worker in the previous job. It follows that direct hiring with a permanent contract is unlikely. More likely, an individual in non-working state and with previous atypical job experiences will be hired with a new atypical contract so that the firm can test the worker's ability. As anticipated, some previous studies confirm this tendency (see for instance Gagliarducci (2005), Alba-Ramirez (1998) and Amuedo-

Dorantes (2000)).

On the other hand, many authors, as Zijl et al. (2004) and van den Berg et al. (2002) find that the probability to move toward a permanent contract is higher if the individual starts from an atypical contract state rather than from a non-working condition. Ichino et al. (2005) also find that temporary-agency employment in some case can provide a stepping stone effect toward a stable job. In other words, the atypical contract can be a springboard toward a permanent job, which can be explained in terms of firm preferences to hire workers that have accumulated human capital during the latest situations.

In my analysis I use the WHIP (Work Histories Italian Panel) dataset, provided by the "Laboratorio Revelli" of Turin in their standard version. WHIP is a database of individual working histories, based on the INPS (National Institute of Social Security) administrative archives, that permits to construct the sequence of monthly contiguous spells. I select a sub-sample of young workers (age ranging between 15 and 32), for whom I can observe complete individual job histories, so that I avoid initial condition problems. In order to catch the effects linked with the presence of repeated spells and multiple risks, I implement a Mixed Proportional Hazard (MPH) model with competing risk (see Gagliarducci, 2005 and Zijl et al., 2004). The MPH model consists of a specification of the Proportional Hazard Model that allows for the presence of unobserved heterogeneity across individuals.

Anticipating my main results, I show that the negative duration dependence related to transitions from a non-employment state toward a permanent contract has clearly increased after the introduction of the Treu Law, while it has slightly decreased for transitions toward atypical contracts. In particular, I find an increase of STU hazard rate and a significant decrease of LTU hazard rate. This evidence seems to confirm that the increase of the availability of atypical contracts could provide a screening instrument for firms. I also find that previous atypical contract experiences have a negative effect on the probability of moving from a non-working condition toward a permanent contract, but that the effect is reduced in the post-reform period. Finally, there is no evidence that the probability of reaching a stable job is higher if the original state is an atypical contract rather than a non-working state. However, positive duration dependence is found for the transitions from an atypical contract toward another contract, confirming that the accumulation of human capital during an AC experience increases the probability of finding a new job.

A

2.2 Data and Institutional background

I define as atypical contracts all the contractual forms that do not provide a permanent work relationship: fixed-term contracts (which I cannot identify in the dataset), apprenticeship contracts, CFL (or on the job training contracts) and temporary contracts (or interim contracts).

CHAPTER 2 — MANUSCRIPT

In Italy, atypical contracts are regulated by numerous laws introduced since 1955, when the first regulation related to apprenticeship contracts was established. In 1962 fixed-term contracts used for seasonal jobs and to substitute absent workers were introduced. This regulation was modified in 1983 and 1987. In 1984 the CFL were introduced in order to ease entry in the labour market. Like fixed-term contracts, they have a specified duration: one year in order to acquire low qualifications and two years in order to acquire high qualifications. The CFL legislation was modified in 1987, by a law which extended their applicability to all sectors in the economy, and in 1994, by a law which raised the age limit for their applicability from 29 to 32. As described above, for about forty years the legislation of the atypical contracts in the Italian labour market was characterized by the introduction of several laws that have left the use of these contractual forms at the margin. Finally, in 1995 were introduced the Coordinate and continuous collaboration (Co.Co.Co) contracts were introduced. Workers hired as Co.Co.Co. are considered to be self-employed presenting a specific relationship with the company featuring. Only in 1997 a more widely covering reform, called the Treu Reform, was implemented in order to bring flexibility and dynamism into the Italian labour market. Finally, in 2003 a new reform (called the Biagi Law) was introduced, that provided an important revision of atypical contracts regulation. The aim of the Biagi Law was to increase the employment rate in the space of few years, in the belief that development must be accompanied by the ability to create additional workplaces.

The law has introduced new contractual forms[2] and has innovated some existing ones, mainly affecting subordinated jobs.

B

2.2.1 The Treu Reform

The Treu Law was introduced on June, 24 1997 (law 196/97) with the aim of making the Italian labour market more flexible, in order to make it more dynamic and to promote the decrease of the unemployment rate. The main novelty of the reform consisted in the introduction of temporary contract (without age limitation for hired workers) and in the creation of Temporary Work Agencies, so that job centres were privatized and decentralized[3]. The reform also modified statutory discipline of fixed-term contracts and changed apprenticeship relationships. Finally, it extended the CFL applicability for depressed areas and for individuals with invalidity, and it raised from 22 to 24 the age limit for apprenticeship contracts.

The following atypical contracts are possible:

Fixed-term contracts: the fixed-term contract permits the hiring of a worker for a pre-determinate duration. They were introduced in Italian legislation in 1962 (law 230/62). Subsequently the fixed-term contract regulation was modified by laws 56/87

[2]The Biagi Law introduced new atypical contractual forms as, job on call, job sharing, insertion contracts and modified part-time, apprenticeship and Co.Co.Co legislation.

[3]TWA employment represents a triangular contract, in which an agency hires worker for the purpose of making him available for a client firm for a temporary assignment.

and 416/93.

Apprenticeship contracts: the apprenticeship contract is a contractual form which obliges the entrepreneur to give the worker the basic notions necessary to transform him in a qualified worker. The legal duration of an apprenticeship contract ranges between 18 months and 4 years, with some exception for the hand craft sector. They were introduced with law 25/55 and were not modified until the introduction of the Treu reform.

CFL (on the job training contracts): the CFL were introduced in order ease the entry in the labour market. They have a determined duration: one year in order to acquire low qualifications and two years in order to acquire high qualifications. The CFL were introduced in 1984 with law 863/84, and they were modified with law 56/87, which extended their applicability to all economic sectors, and with law 451/94, which raised from 29 to 32 the age limit for their applicability.

Temporary contracts: they were introduced by the Treu Reform and law 469/97, according to which jobcentres were privatized and decentralized. TWA employment represents a triangular contract, in which an agency hires a worker for the purpose of making him available for a client firm for a temporary assignment.

B

2.2.2 Data

In my study I use the WHIP (Work Histories Italian Panel) data, in its standard version, provided by the "Laboratorio Revelli" of Turin. WHIP is a database of individual working histories, based on the INPS (National Institute of Social Security) administrative archives, and consists of a representative sample with a dynamic population of 370.000 individuals. For each individual it is possible to identify all work relationships, and their contractual forms. The information is inferred by the contributions paid to INPS. From the type of contributions it is possible to distinguish individuals employed with a permanent contract (contributions which do not provide for special term, contributions related to "reintroduction" contracts and contributions related to particular permanent contract) or with an atypical contract (contributions related to CFLs (work training contracts), contributions related to temporary (or interim) contracts and contributions related to apprenticeship contracts). Still unidentifiable are individuals employed with a fixed-term contract. Individuals employed with the Continuative and Coordinate Collaboration (Co.Co.Co.) contract, that Italian legislation classifies as self-employed, also are not included in my sample because only yearly information are available on

them[4].

Monthly information is available, so that it is possible to determine the monthly duration of each spell, directly from the dataset for the employed, and indirectly the non-working ones (as the difference between the end of the previous contract and the start of the subsequent one).

The database comprises information from 1985 to 1999 for all workers, but I used only the information for individual aged 15 to 32 and having had at least one job relationship in the years included between 1995 and 1999. The availability of information since 1985 and the use of a sub-sample including only young individuals, makes it possible to reconstruct the complete individual work histories with accuracy[5]. It is particularly important because I can observe workers from the beginning of their career, avoiding initial-condition problems.

Constructing my sub-sample, if an individual presents, at the same time, more than one work relationship, I eliminate the shorter job relationship and, if of the same duration, I remove the part-time jobs or the work relationships characterized by fewer days of effective work. Finally, when the second job starts before of the end of the first

[4]However, my dataset allow me to control individuals employed at least once with a Co.Co.Co. contract. They constituted about 3.5% of observations in the pre-reform period and 4.5% in the post-reform one. Eliminating the latter individuals by my sample do not involve for a change in presented results. Estimates without Co.Co.Co. employees are available on request.

[5]I have eliminated individuals whose job relationships began before of 1985.

job but ends after it, I censor at left the second work spell, and so I hypothesize that the second job starts only when the first ends. In this way, the passage from double job to single one is found as a transition from a job to another. This strategy is adopted in order to reconstruct the non-working duration spells with accuracy. By adopting this procedure I implicitly assume that the elimination of multiple jobs leave the final sample to be representative.

The comparison between the pre reform situation and the post reform one, is carried out dividing the selected sub-sample in two sub-groups, the first related to the spells started and ended before June 24th 1997 (day in which the Treu Reform became law), and the second related to the spells started after the introduction of the law. Finally, I consider as right censored spell all the spells started before the Treu Reform introduction and ended after it, censoring them on June 24th 1997. This procedure leaves me 137876 observations for 32483 individuals, of which 94160 spells (37614 permanent contract spells, 14622 atypical contract spells and 41924 non-working spells) related to the pre reform period and 43675 spells (16647 PC spells, 7485 AC spells and 19543 NW spells) related to the post-reform one.

Table 3 reports the evolution of share of new atypical contracts stipulated in Italy from 1985 to 1999 and from 1995 to 1999. As can be noted, a heterogeneous increase of atypical contracts stipulated is found. Clearly a different growth rate is noted if the origin is placed in 1985 or in 1995: in particular it is respectively, meanly,

+170% and + 38%. With respect to the period from 1985 and 1999, the higher growth rates of the number of atypical contracts stipulated are found for northern workers (about +245%), women (about +210%) and above all for high skill workers (+1500%). In particular before or up to 1985 only 1.50% of the latter group worked with an atypical contract, against about 25% in 1999. As regards the period between 1995 and 1999, I find that, from a territorial point of view, the North-east of Italy is characterized by a higher atypical job rate (34%), but also by a lower growth rate (25%).The North-west is confirmed as the area characterized by the higher growth in atypical contracts stipulated (54%), while the growth rate in the southern regions is 41%. Stronger differences are found related to gender and qualification variables. In particular, in the post-reform period the growth rate of atypical contracts has been double for women compared to men (55% against 28%), determining an overtake of female rate (in pre-reform period male rate was about 23%-25% against 20%-21% of female rate, while in 1999 this became 30% for men and 32% for women). A very strong difference in growth rate can be noticed referring to the qualification variable. My data show that the growth rates of white collar workers is about 115% against 32% for blue collar workers. The growth rate of the atypical contracts remains higher for the latter (33% against 25%).

The independent variables directly or indirectly available from the dataset concern individual job-related characteristics. In particular, I use information about age, gender (one dummy), territorial area (three dummies), blue collar (one dummy), eco-

nomic sector (two dummies), tenure, number of previous atypical contract experiences (three dummies), the daily wage related to the previous job, part-time job experiences (one dummy), the type of the first contract in working histories (a dummy). Finally, I introduce a variable related to the annual employment growth in order to capture the business cycle effect. In table 4 I report some descriptive statistics, distinguishing between pre and post reform periods and by state of origin. A first noteworthy observation consists in the distribution of type of spells over reform periods. In fact, while non-working spells remain unchanged both in pre and post reform periods (at 44.5%), a decrease in permanent job spells (from 40% to 38%) and an increase in atypical job spells (from 15.5% to 17.5%) is shown. With respect to covariates, the individuals included in my sub-sample are on average 23 years old in the pre-reform period and about 24 years old in the post-reform one. Atypical job spells are characterized by a lower age, meaning that it is more likely that a non-stable contract is experienced by younger workers. About 2/3 of my sample consists of male workers, and they are more likely to live in the northern regions (about 60%), rather in the southern regions (about 22%-23%). Blue collar spells represent about 80% of observations. It is interesting to remark that only 9% of atypical spells were white collar in the pre-reform period, but this percentage almost doubles in the post-reform one. About 30% of observations are related to individuals who have been employed in the building or in the tourism sectors, both more likely to be characterized by atypical contracts. A strong difference is found

in terms of mean wage according to contractual forms. As expected, workers employed in atypical jobs show a mean wage clearly below that of workers' employed with a permanent contract. The observations related to actual or previous part-time job increase from 8% to 13% in the post reform. The amount of previous work experiences (tenure) is strongly higher for permanent job spells than for atypical job experiences, meaning one more time that younger workers (more likely characterized by lower tenure) are atypical employees. About 58% of observations are characterized by absence of previous atypical job experiences. Multiple previous atypical job experiences seem to be more likely for individuals currently employed with atypical contracts. This evidence suggests that repeated atypical contracts increase the probability of finding a new atypical job rather that a permanent contract. First contract type variable was included in order to catch possible heterogeneity in working histories between workers beginning with a permanent contract rather that an atypical contract. In my sub-sample, I found that more of 50% of working histories began with a permanent job. Finally the employment growth rate is substantially different between pre and post -reform period, about -0.02% before the introduction of the Treu Reform and about +0.85% after.

A

2.3 Empirical specification

The specification of the model is guided by standard job-search theory. It is assumed that unemployed individuals devote some of their time searching for jobs, but also that

once an individual has accepted a job and starts working, he or she could continue searching for a better job. Two types of jobs are considered here: permanent jobs and atypical jobs. In addition I assume that: permanent employment is always preferred to an atypical job, except for cases in which the conditions are linked to the permanent contract (i.e. job tasks). An individual searching for permanent employment can accept an atypical contract when the search for a stable job takes too long. I also assume that an individual employee with a permanent contract accepts to move toward an atypical contract, if this offers better working conditions and/or prospects. Finally, the transition from a job toward a non working state can depend on the end of the contract, dismissal, individual work preferences, etc.

Given the starting hypothesis, it is possible that an individual stays in one of the possible origin states: permanent contract (PC), atypical contract (AC) or a non working condition (NW), therefore the follow transitions are admissible: PC-PC, PC-AC, PC-NW, AC-PC, AC-AC, AC-NW, NW-PC, NW-AC.

By providing monthly information, the data allow for the analysis of individual work history, permitting to identify the origin state and, in presence of uncensored spells, the type of transition. Therefore, for each individual it is possible to observe a sequence $t_i = \{t_{ic}\}_{c \in \{1 \ldots Ci\}}$ of contiguous periods of time (spells) spent in different states. t indicates the elapsed duration in a particular state, c denotes the cth spell of individual i and, following the previous notations the left state indicates the state

of origin, denoted by the first subscript (j), while the right state indicated the state of destination, denoted by the second subscript (k).

In order to allow for the presence of repeated spells and multiple risks, I implement a Mixed Proportional Hazard (MPH) model with competing risks[6]. The MPH model consists of a specification of the Proportional Hazard Model that allows for the presence of unobserved heterogeneity between individuals. Duration analysis ignoring the presence of unobserved heterogeneity can imply biased estimates (Lancaster, 1990). Lancaster (1979) was the first to treat this problem, proposing an estimate of a Proportional Hazard Model with multiplicative unobserved heterogeneity. The main advantage of this empirical specification is its flexibility, which allows me to take account of the following determinants of transitions: state dependence, duration dependence and unobserved heterogeneity. State dependence accounts for the possibility that the transition probabilities depend on the origin and the destination states, allowing to test whether the probability of transition into a permanent contract are different for non workers and atypical employed individuals. Duration dependence accounts for the possibility that the time during which an individual has been occupied in the current state

[6] A competing risks model can be thought as a model for multiple durations that start at the same point of time for a given subject, where the subject is observed until the first duration is completed and one also observes which of the multiple durations is completed first. The term 'competing risks' originates from the interpretation that a subject faces different risks i of leaving the state it is in, each risk giving rise to its own exit destination which can also be noted by i, (see van den Berg, 2005).

affects the transition probabilities. Finally, the unobservable heterogeneity is likely to matter in this context due to differences in tastes, ability, or other characteristics that are not reported in WHIP.

A certain debate exists about the possible assumptions of unobserved heterogeneity distribution, since the MPH model estimates may be biased when the chosen distribution for the unobservable term is incorrect. Heckman and Singer (1984) showed that the problem can be avoided by using the Non-Parametric Maximum Likelihood Estimator (NPMLE) that approximates the distribution function of unobservables with a finite mixture distribution. In this case, as proposed by Heckman and Singer (1984), the estimation is implemented by an EM-algorithm.

Abbring and Van den Berg (2006) proved that in a large class of hazard models with proportional unobserved heterogeneity, the distribution of heterogeneity among survivors converges, often rapidly, to a gamma distribution. In multiple spells duration analysis, often it is natural and convenient to assume that such duration have identical unobserved heterogeneity terms V. From this, in the MPH models for multiple-spell data, the multiple duration that a single individual spends in the same state are dependent because they are affected by the same realization of V.

Given these considerations, I assume that the hazard rate to state k after a sojourn in state j for the individual i is defined as:

$$\lambda_{ijk}(t_i^c|x_{ijk}, v_{ijk}; \beta) = \lambda_{0ijk}(t_i^c) \exp\left(x'_{ijk}\beta_{jk}\right) v_{ijk}$$

where:

1. λ_{0ijk} is a baseline hazard which measures the effect of the elapsed duration (duration dependence). Here assume that the baseline hazard follows a Weibull distribution and therefore it can be expressed as:

   $$\lambda_{0ijk}(t_i^c) = p_{jk} t_i^{p_{jk}-1}$$

   with:

   Positive duration dependence for $p_{jk} > 1$

   Negative duration dependence for $p_{jk} < 1$

   No duration dependence for $p_{jk} = 1$

2. x_{ijk} is a vector of no-time varying individual covariates, which capture personal, job-related and macroeconomic characteristics;

3. $\beta_{jk}$is a vector of unknown parameters;

4. v_{ijk} is a random individual effect, which is intended to catch the effect of individual heterogeneity. Here I assume that it is Gamma distributed.

   $$V|X \sim \Gamma(1, \theta)$$

The unit of time is one month. The individual covariates x_{ijk} are fixed to their values at the beginning of each spell.

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The individual contribution to the likelihood function of an incomplete (right censored) spell, that is, the probability of surviving in state j until time t, can be expressed as follows:

$$S_j\left(t_i^c|W_i;\Omega\right) = \exp\left\{-\Lambda_j\left(t_i^c|W_i;\Omega\right)\right\}$$

where:

$$\Lambda_j = \int_0^{t_i} \sum_{k\neq j} \lambda_{jk}\left(s|W_i;\Omega\right)\partial s^{7}$$

is the corresponding integrated hazard function, $W_i = \{x_{ijk}, v_{ijk}\}_{k\neq j}$ is the vector of all observed and unobserved variables and Ω is the vector of all unknown parameters (β, θ).

The individual contribution to the likelihood function of a completed spell of duration t_i^c spends in state j that ends in state k is therefore:

$$f_{jk}\left(t_i^c|W_i;\Omega\right) = S_i\left(t_i^c|W_i;\Omega\right) \times \lambda_{jk}\left(t_i^c|W_i;\Omega\right)$$

In the first instance, to see how the model works, suppose that there is no unobserved heterogeneity, that is, $(v_{ijk} = 0)$. The contribution to the log-likelihood function of an individual with a sequence of spells $\{t_{i1}, t_{i2}, \ldots, t_i^{C_i}\}$, then is:

[7] It is possible that $j = k$ for $PC - PC$ and $AC - AC$ transitions.

$$\ln\left(L_i\left(\Omega|t_i^1,t_i^2,...,t_i^{C_i};x_i\right)\right) =$$
$$= \sum_{c=1}^{C_i}\sum_{j=1}^{3}\left[\left(\sum_{k\neq j} d_{jk}^c \ln\left(f_{jk}\left(t_i^c|x_i;\Omega\right)\right)\right) + r_j^c \ln\left(S_j\left(t_i^c|x_i;\Omega\right)\right)\right]$$

where d_{jkc} is an indicator variable which equals one if the individual changed from state j to state k in the c_{th} spell and zero otherwise, and r_{jc} is a dummy variable which equals one if the c_{th} spell is incomplete and zero otherwise. The log-likelihood function for each sub-group (the first related to the pre-reform period and the second related to the post-reform one) is the summation of the previous equation over the N individuals. This log-likelihood formulation breaks up into separable contributions from each type of transition. Therefore, given that the hazard rate depends upon disjoint sets of parameters, the sub-likelihood functions can be maximized separately and the parameters of each transition can be estimated independently. In this version, without unobserved heterogeneity, the standard errors are estimated using the Huber-White estimator in order to obtain consistent estimates of them. The usual standard error may be incorrect also because of the effects of clustered data. In this case, the variance estimator becomes:

$$Var = \left[I\left(b\right)\right]^{-1} B \left[I\left(b\right)\right]^{-1}$$

where$B$ is a correction factor.

When the unobserved heterogeneity term is introduced the model becomes

more complicated. In this case, in fact, it is not possible to condition the individual probabilities on v_{ijk} since they are unobservable, but it is necessary to integrate v_{ijk} over all possible values to get the unconditional probabilities. In this sense, let us assume that individual effects are identically and independently distributed for all individuals with a joint distribution function:

$$\Gamma\left(v_{iPCPC}, v_{iPCAC}, v_{iPCNW}, v_{iACPC}, v_{iACAC}, v_{iACNW}, v_{iNWPC}, v_{iNWAC}\right)$$

This specification imposes that the likelihood function maximization happens jointly, since the unobservable heterogeneity terms are correlated across different transitions. For example, the observed transition rate from atypical contract to permanent contract may be higher than the observed rate from non-working to permanent job just because individuals for whom it is easy to find regular work tend to self-select into atypical job. Then v_{iNWAC} is positively related to v_{iNWPC} and v_{iACPC}. It is possible that persons who most easily find permanent job find less easily an atypical contract, which means that v_{iNWAC} and v_{iNWPC} are negatively correlated.

Here, in order to simplify the estimation procedure, I assume that the v_{ijk} terms are independent. In this case, then, it is possible to estimate separately the sub-likelihood function by transition type. The individual sub-likelihood function related to origin state j and destination state k, is:

$$L_{ijk}\left(\Omega | t_i^{c_j}, x_{ijk}\right) =$$

$$= \int_{-\infty}^{+\infty} \left(\prod_{c=1}^{C_{ij}} \prod_{k \neq j} f_{jk} \left(t_i^{c_j} | x_{ijk}, v_{ijk}; \Omega \right)^{d_{jk}^{c_i}} \times \prod_{c=1}^{C_{ij}} S_j \left(t_i^{c_i} | x_{ijk}, v_{ijk}; \Omega \right)^{r_j^{c_i}} \right) \times d\Gamma \left(v_{ijk} \right)$$

where c_j indicates the cth spell in the state j. The log-likelihood function is obtained by summation of the sub log-likelihood function respect to i, j and k:

$$\ln \left(L \left(\Omega | t_i^c, x_{ijk} \right) \right) = \sum_{c=1}^{C_{ij}} \sum_{j=1}^{3} \sum_{k \neq j} \ln \left(L_{ijk} \right)$$

A

2.4 Results

Figures 1-5 show, as preliminary matter, how the Treu Reform has affected the duration dependence, if the probability of moving from a non-working state to a permanent contract is affected by previous atypical job experiences and, finally, if an atypical job experience provides a stepping-stone effect toward a permanent contract.

First I analyze the effect of the reform on the duration dependence related to the transitions out of a non-working state (see tables 6a and 6b). In particular, it is interesting to evaluate the effect of the reform on the duration dependence for NW-PC transition. My estimate seems to confirm the theoretical prediction, i.e. a decrease in the duration dependence parameter (p). In fact, I found that no duration dependence exists in the pre-reform period ($p = 1$), while a negative duration dependence exists after the introduction of the Treu reform ($p = 0.89$), meaning that the probability of finding

a stable job is negatively related with time spent without a job. This finding seems to suggest that in a more flexible labour market, characterized by higher probabilities to find a job, to be a LTU can be perceived as a signal of low productivity by firms, determining a reduction in the LTU hazard rate and, at the same time, an increase in the hazard rate for the STU, who are more likely to receive an offer. In particular, my results show that the probability of moving out of a non-employment state toward a permanent contract is increased for the STU and is decreased for the LTU. I also found a decrease in the duration dependence parameter for NW-AC transitions, but the reform effect is rather small (from 0.94 to 0.92), and the probability of moving from a non-working state toward an atypical contract increased overall.

I also found some territorial differences in NW-PC transitions. In the northern regions (I show the results related to North-West), the hazard rate for transitions toward a permanent contract has increased for individuals who have not been in paid work for less than of 18 months, while for southern workers it has increased only for individuals not employed for at most 9 months. A possible explanation of the latter evidence consists in the low level of demand for labour in the South.. In fact, if firms hire non-employed individuals ranking them according to non-working duration (short duration hired first), then for individuals living in regions characterized by lower labour demand, the hiring selection will stop near the top of the list, and therefore only individuals with short non working durations are hired.

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With regard to the effect of previous atypical job experiences on the probability of reaching a permanent contract (see table 5a and 5b and figure 4 and 5), generally I find a negative effect whatever is the origin state (a similar result is found by Gagliarducci, 2005). This evidence is not confirmed in the post-reform period, in fact the statistically significant negative effect of the previous atypical job experiences is found only if the origin state is a non-working condition. Clearly, after the introduction of the Treu reform, in a labour market with higher job turnover, having had a previous AC experiences is not necessarily a bad signal, and it does not cause a statistically significant decrease the probability of finding a new job if the origin state is a working condition. Figures 4-5 compare the effect of previous AC experiences on the probability of leaving a non working state toward a permanent job or an atypical job. My results suggest that previous AC experiences decrease the probability of reaching a stable job, but they increase the probability of finding an atypical job (above all in post-reform period). This evidence seem to mean that firms can hire non-working individuals with previous AC experiences for the purpose of testing, once more, their ability and, eventually, of hiring them in a stable position after the atypical job experience.

Do atypical job experiences provide a stepping stone towards a permanent contract? I answer to this question comparing the probability of moving toward a stable job, starting from a non-working state or from an atypical contract. The evidence shows that the hazard rate is higher if the state is a non-working condition, a trend

confirmed both for the pre-reform period and the post-reform one[8]. However, related to this transition, a positive duration dependence is found, therefore the probability of moving toward a permanent contract increases with the contract duration, suggesting the existence of a human capital accumulation effect. However, interpreting the duration dependence parameter, I find that this effect is clearly decreased after the introduction of the Treu reform ($p = 1.54$ in the pre-reform and $p = 1.10$ in the post-reform). On the one hand, a possible explanation can be related to the introduction of temporary contracts, that unlike CFL and apprenticeship contracts, are not meant to provide specific training to workers, and are more likely to allow for interrupted job relationships, therefore decreasing the probability of reaching a stable job. On the other hand, a non-working state allows for greater search intensity than a working state, yielding a more profitable job-search. In this case the probability of finding a stable job can be higher starting from a non-working state rather than from an atypical job.

In tables 5a, 5b, 6a and 6b, I present the results obtained by MPH model

[8] In a previous version of this paper (where the firm size variable was included in my analysis, and more of 20000 observations were crossed out, because of missing information for firm dimension, most of them related to 1999), an opposite result is found related to the post-reform period. In particular, there was evidence of a stepping stone effect for atypical contract duration longer than three months. This result was strongly affected by the value of the duration dependence parameter (1.97) for the AC-PC transition in the post-reform period, meaning that one more month of contract duration doubled the probability of moving toward a stable job.

with competing risk and Weibull baseline hazard specification, assuming Gamma distributed unobserved heterogeneity. Generally, in the post-reform period, it emphasizes a decrease of the duration dependence parameter (p) for the transitions out of a non-working state[9]. However, with regard to the transitions out of a job position, results confirm expectations. The probability of leaving a stable job toward a new job tends to increase with the contract duration, whatever is the cause of job separation. In contrast, the probability of losing a stable job, moving toward a non-working state decreases with contract duration. Very similar results are found for the transitions out of an atypical job. This evidence also seem to confirm the existence of the human capital accumulation effect.

The estimated coefficients resulting from the model allow me to interpret the effects of personal and job-related characteristics, and of macroeconomic conditions, on the probability of moving from one state to another. Illustrating my results, I show first the ones related to the transitions starting from a non-working state and subsequently the ones related to the transitions starting from a job position.

With regard to personal characteristics, i.e. age, gender, area of residence and qualification, some evidence appears to be unambiguous (see tables 5a and 5b). The introduction of the Treu reform has increased the duality of the labour market, relatively

[9] My estimates show an increase of the duration dependence parameters for the NW-AC transitions, when unobservable heterogeneity is assumed to be equal to zero.

reducing the probability that disadvantaged workers reach a stable job moving from a non-working state. In fact, the positive effect deriving from being a male worker, who lives in northern regions and is highly skilled has increased in the post-reform period. Similar effects are found for the transitions from a non-working state to an atypical job, but the introduction of the Treu reform has reduced the duality with respect to disadvantaged workers. Therefore, the Treu Law seems to allow for an equal distribution of benefits deriving from the increased probability of leaving a non-working state but, at the same time, these benefits are unequally distributed in terms of job stability and quality, and imply therefore an increase in the duality of the labour market.

Economic sector dummies, one for previous employment in the building sector and another for previous employment in the tourism sector, show positive effects for the NW-PC transitions and negative effects for the NW-AC transitions in the pre-reform period. After the introduction of the Treu reform being employed in building or tourism negatively affects the probability of reaching a job, confirming, as previously mentioned, that these economic sectors are more likely to be characterized by unstable job relationships and by scarce provision of training. The age level in the previous job shows a positive effect, even if not always significant; the positive sign can be explained in term of a higher wage for white collar workers. The part-time dummy coefficient, related to previous employment, has a negative effect on the probability of leaving a non working state, which increases in magnitude after the Treu Reform. Tenure

variable estimates show an expected positive effect only in the post-reform period, for both transition types, suggesting that the accumulation of knowledge while working increases the probability of finding a new job. This confirms that firms prefer to hire workers with some work experience. An unexpected negative effect is found in the pre-reform period. As anticipated, previous atypical contract experiences play a negative role on the probability of reaching a permanent contract, while a positive effect is found related to the transitions toward an atypical job. The introduction of the Treu reform has generally reduced these effects. In both cases, my results seem to confirm that workers in a non-working position and with previous AC experiences, are more likely to be reinserted in a job state although first in an atypical job. This result may reflect the fact that atypical jobs allow firms to reduce the cost of testing the workers' skills. Finally, the employment growth variable included in order to catch the business cycle effects, shows a positive sign for the transitions both toward a permanent contract and toward an atypical contract in the post-reform period, meaning that increasing production raises the probability of finding a job. A negative effect of the business cycle variable is found for the NW-AC transitions in the pre-reform period.

With respect to the flow out of a job position, the probability of a PC-AC transition in the post-reform period is not estimated because the maximization likelihood process does not converge. Other transitions show the following results. Estimates related to AC-PC transitions allow to know which characteristics increase the

probability of transforming an atypical contract in a stable job, and the effect of the Treu reform on them. In terms of personal characteristics, the usual duality against disadvantaged workers arises. The introduction of the reform seems to have increased overall gender inequality. Estimates of the economic sector dummies show the expected negative signs. Wage and tenure variables show an expected positive effect but they are significant only in the pre-reform period. On the contrary, part-time and previous AC experiences play a negative role on the probability of finding a stable job starting from an atypical contract. The employment growth indicator shows a non-significant estimate in the pre-reform period and a unexpected sign in the post-reform period. Transitions between two atypical contracts are less likely for individuals belonging to the disadvantaged group, even if the introduction of the reform has reduced the difference. Some estimates lose their significance after the introduction of the Treu reform. Workers employed in tourism and building have the usual relatively low probability of finding a new job. In contrast, the tenure variable appears to increase the probability of repeating an atypical job experiences. The level of the daily wage negatively affects the transitions between atypical contracts in the pre-reform period, but the estimate changes sign post-reform. Previous AC experiences show negative or not significant coefficients, confirming that, whatever happens, repeated atypical contracts reduce the probability of reaching a new job. The probability of losing an atypical job seems to be greater for workers living in the North-East regions in the pre-reform period. On

the contrary, in the post-reform, it is smaller for workers living in the North-West area. Both in pre and post -reform periods the probability of leaving an AC is negatively affected by living in southern regions. Finally, as expected, the probability of losing an atypical job decreases with increasing production. Transitions starting from a permanent contract seem to be affected in a similar way by variables similar to the previous ones, and potentially explained by similar reasons. The Probability of leaving a permanent contract toward a new job, is positively affected for male workers living in northern regions. Negative signs are shown by the southern area dummies, and by tourism dummies, even if they are not always significant. Unclear effects arise from wage, tenure and variables indicating previous AC experiences. Finally, PC-NW transitions seem more likely for disadvantaged workers, overall in the pre-reform period. However, previous AC experiences decrease the probability of losing a permanent contract.

A

2.5 Conclusions

The main purpose of this paper was to address questions related to an Italian labour market reform – the Treu Law. First, I was interested in possible changes in duration dependence related to the transitions starting from a non-working state. Second, I analyzed the effect of previous atypical contract experience on the probability of moving towards a permanent contract. Finally, I studied whether the probability of reaching a permanent contract is higher when starting from a non-working state or from an

atypical job.

Empirical analysis was carried out estimating the hazard rates among the possible states: permanent contracts, atypical contracts or a non-employment condition. My estimates are obtained applying a Mixed Proportional Hazard model with competing risk to a sub-sample composed of individuals aged 15 to 32, drawn from the WHIP dataset. I use information between 1985 and 1999, selecting individual with completed work histories, in order to avoid an initial condition problem. My main findings, taking data limitations into account, seem to suggest that:

1. The larger use of atypical contractual forms, due to the introduction of the Treu Reform, provided a potential screening instrument for the hiring policies of firms. In fact, in a more flexible labour market, with more job opportunities, to be long term unemployed may be an indicator of low productivity. Empirically this finding consists in an increase of negative duration dependence for the spells starting from a non-working state; i.e. a widening of the short-term unemployed - long-term unemployed duality;

2. Previous atypical contract experiences reduces the probability of starting a permanent job, if the state of origin is a non-working condition. Clearly to be in a non-employment position after some job experiences may be a bad signal about the worker's abilities.

3. I do not find evidence that the probability of reaching a stable job is higher starting from an atypical contract rather than from a non-employment position. On the other hand, I find positive duration dependence related to the transition from an atypical contract to a permanent contract. This finding seems to suggest the existence of a positive "human capital accumulation" effect on the probability of obtaining a stable job. The introduction of the reform has reduced this effect.

4. Heterogeneous effects are found related to gender, area and qualification variables. In fact, male, northern and high qualified workers show, generally, a larger probability of finding a job starting both from an atypical contract and a non-working state. The introduction of the Treu reform has increased the duality in the labour market increasing the difference in the probability of reaching a stable job moving from a non-working state between advantaged and disadvantaged workers..

All these findings suggest that the introduction of the Treu Reform, extending the use of atypical contract, allows for greater efficiency in the hiring process of firms.

On the other hand, atypical job experiences can become an obstacle to the reaching a stable job, if the path to a permanent contract includes periods of inactivity, and if it includes short atypical contract experiences that do not permit workers to accumulate human capital. Also, the Treu reform has contributed to increase labour market duality.

In terms of policy implications, this suggests the desirability of promoting

longer contractual durations and facilitating training programs, during inactivity periods, in order to increase human capital accumulation. Also, policies should provide support to workers while searching for a job, contributing to reduce non-employment state durations. Finally, these policies are necessary above all for disadvantaged workers, that is female, southern and low-skilled workers, who have more difficulty in finding a job.

CN # Chapter 3

CT # Labour Market Transitions in Italy: the Effects of the Treu Law on Flows from an Atypical Contract

A ## 3.1 Introduction

For many years the European labour markets have been characterized by high and persistent unemployment rates. There is a broad consensus among economists that the tight regulation of the labour market is a principal cause of this phenomenon. In order to overcome this problem, measures have been suggested for increasing flexibility in labour markets, with the introduction of atypical contractual forms (in particular,

fixed-term contracts and temporary contracts) characterized by low hiring and firing costs. Reforms inspired by this principle have been followed by reduced unemployment rates and increased dynamism of labour markets.

In Italy the discipline of atypical contractual forms has a long history. The first laws related to atypical contracts were introduced in 1955 (Law 25/55) which disciplined apprenticeship contracts. In 1962 Law 230/62 introduced the fixed-term contracts while in 1984 the Contratti di Formazione Lavoro (CFL) (Contracts of Training and Employment) were introduced by Law 863/84. Law 56/87 introduced some changes in the CFL legislation, by making them applicable to all economic sectors, and Law 451/94 raised the age limit of their applicability from 29 to 32.

In 1997, in concomitance with the highest unemployment rate in Italy in recent decades, the Treu Law was introduced in order to bring flexibility and dynamism to the Italian labour market. The Treu Law (196/97) represented a major step towards the liberalization of atypical contracts; it brought innovations to the discipline of fixed-term contracts, it introduced temporary contracts, and it created the Temporary Work Agencies (TWA) (see table 1). TWA employment represents a triangular contract, in which an agency hires a worker for the purpose of making him available to a client firm for a temporary assignment. In 2003 the Treu regulations were replaced by the Biagi Law (law 30/03), which introduced a large number of new atypical contracts, eliminating CFLs, and reforming apprenticeships and temporary contracts.

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Evidence from the labour market suggests that the Treu reform has contributed to the reduction of the unemployment rate partly as a consequence of a more flexible labour market. The question remains open with regard to the effects of previous atypical contract experiences on the probability of reaching a permanent job, and on the likelihood to move directly from an atypical to a permanent contract. In this sense, the Treu Law represents a natural experiment that allows us to analyze these questions.

Previous studies on this topic, mostly on the Spanish labour market (since 1984 Spain introduced a temporary contract policy that was far more liberal than that of other European countries), show that repeated temporary job experiences are more likely to become a trap than a step towards permanent employment (see Alba-Ramirez, 1998 and Catalina Amuedo-Dorantes, 2000). Maia Güell and Barbara Petrongolo (2004) find that the conversion rate from temporary to permanent contracts is rather low, and tends to take place close to the deadline of the temporary contract. In a study on the Italian labour market in the pre reform period, Gagliarducci (2005) shows that the probability of moving from a temporary job to permanent employment increases with the time spent in the temporary contract, but decreases with repeated temporary employment experiences, and especially with interruptions for non-working spells. In another study, relative to the post reform period, conducted using TWA data, Ichino, Mealli and Nannicini (2005), find that TWA employment creates a "springboard" to-

wards permanent jobs, where TWA jobs are considered as a treatment assignment.

In this paper I want to investigate these phenomena, and also try to explain which effects the Treu reform has had on them. In particular I want to test how repeated previous atypical experiences and the duration of current employment affect the probability of transition out of current atypical contract. Besides, I want to evaluate how individual and job characteristics influence this probability of transition. Finally, another labour market dimension can be affected by the introduction of the Treu Law, i.e. the transition from a non-working state. In this case, it is plausible that the transitions towards an atypical contract are increased, while the transitions towards a permanent job are decreased. With this aim I estimate the flow out from an atypical job towards one of three possible new states: non-working condition (NW), permanent contract (PC), or new atypical contract (AC).

In my analysis I use the WHIP (Work Histories Italian Panel) data, provided to me by the "Laboratorio Revelli " of Turin in their standard version, for the period ranging from August 1994 to December 1999. WHIP is a database of individual working histories, based on the INPS (National Institute of Social Security) administrative archives that allow one to identify the contract type for each job experience, its monthly duration, and some individual and work history characteristics. In my study I select a sub-sample of atypical working relationships and estimate the transition from this original state to the three possible new states (non-employment, permanent contract

and new atypical contract), using two versions of Multinomial Logit (MNL) Model. In the first version I use the standard MNL Model that is based on the assumption that the probabilities of the alternative choice are independent of each other (independence from irrelevant alternatives (IIA)). The validity of this assumption is tested using tests introduced by Hausman and McFadden (1984) and Small and Hsiao (1985). In the second version I apply a Random Effects Multinomial Logit Model that allows me to consider the possibility of unobserved heterogeneity and to relax the IIA assumption.

My results show that gender, area of residence, economic sector, contract duration and previous AC experiences have a role in determining individuals' probabilities of transitions towards a new job or a NW condition. The probability of moving to a new job is positively affected by male gender, working in the North and the duration of the current contract. On the contrary, a negative effect is found for the workers employed in the tourism sector and for those have had two or more previous AC experiences. The random effect MNL model seems to confirm the presence of unobserved heterogeneity and a positive correlation between transitions towards a PC or a new AC, suggesting that those individuals that move towards a permanent contract rather than move to a NW condition, are also likely to move towards a new atypical job.

Finally, I find that after the introduction of the Treu Law, the rate of transitions from a non-working state towards an atypical contract increased strongly, while are the transitions towards a permanent contract decreased.

The remainder of this paper is organized as follows. Section 2 provides the theoretical model and the empirical specification for the study. Section 3 describes the data, while section 4 presents the results of the econometric analysis of the factors affecting the individual's probability of transition out of an atypical contract towards a new state. Finally, conclusions follow in section 5.

A

3.2 The model

The model specification follows the standard job-search theory. In particular, it is assumed that, an individual continues to search for a better job even though he is working with an atypical contract. When the job ends (because of the deadline of the contract or because of a new contract), the individual can move to a new job or to a non working condition, depending on whether the utility of not working is higher than the utility of the employment position. However, the destination state is also influenced by the labour demand side. In order to catch this effect, I assume that the utility function also includes a labour demand variable, which affects the individual transition type.

In order to investigate the determinants of the workers' probability of transitions out of an atypical contract towards the new possible states (non-employment, permanent contract or new atypical contract), I implement two versions of the Multinomial Logit Model. Let j index the J possible categories of the polytomous response variable; it is convenient to think of these categories as alternatives and the response

among alternatives even if the response does not strictly represents a choice. As anticipated, the multinomial probabilities associated with each response can be derived by assuming that an unobserved utility U_{ij} is associated with each alternative, and that the alternative with the highest utility is selected.

The first version consists in a standard Multinomial Logit Model pooled over time and it is implemented for comparison purposes. These models are based on utility maximization and derived by introducing utilities U_{ij} for each agent i and choice j. It is assumed that the alternative with the greatest utility is chosen. Thus, the probability that the choice j is made is the following:

$$\theta_{ij} = \Pr\left(Y_i = j\right) = \Pr\left(U_{ij} > U_{ik} \quad \forall j \neq k\right)_i$$

the utility of choice j is modelled as:

$$U_{ij} = H_{ij} + \varepsilon_{ij} \quad \forall j$$

where $H_{ij} = x_i\beta_j$ is called a linear predictor and ε_i is a random term. x_{ij} is a vector of explanatory variables including individual and job-related characteristics as well as a macro-economic indicator.

The MNL model can be derived assuming that the ε_i's are independent and identically distributed with a type I extreme-value distribution for all i:

$$f\left(\varepsilon_{ij}\right) = \exp\left(-\varepsilon_{ij} - \exp\left(-\varepsilon_{ij}\right)\right)$$

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In the setting of standard multinomial logit models the probability of jth alternative may be specified as follows

$$\theta_{ij} = \frac{\exp\left(x_i'\beta_j\right)}{1 + \sum_{j=2}^{J} \exp\left(x_i'\beta_j\right)}$$

where the $j = 1$ is selected as basecategory and the $\beta_1 = 0$ condition is imposed for identification purposes.

I estimate this model by maximum likelihood. The probability of an individual i choosing the alternative that it was actually observed to choose can be expressed as:

$$\prod_{j=1}^{J} \left[\frac{\exp\left(x_i'\beta_j\right)}{1 + \sum_{j=2}^{J} \exp\left(x_i'\beta_j\right)} \right]^{y_{ij}}$$

where y_{ij} if the individual i chose j and zero otherwise. Assuming that the observations are independent the likelihood for N observations may be written as:

$$\prod_{i=1}^{N} \prod_{j=1}^{J} \left[\frac{\exp\left(x_i'\beta_j\right)}{1 + \sum_{j=2}^{J} \exp\left(x_i'\beta_j\right)} \right]^{y_{ij}}$$

taking logs results in the following log-likelihood function

$$\ln L\left(\beta\right) = \sum_{i=1}^{N} \sum_{j=1}^{J} y_{ij} \ln \frac{\exp\left(x_i'\beta_j\right)}{1 + \sum_{j=2}^{J} \exp\left(x_i'\beta_j\right)}$$

Since some omitted individual characteristics may cause observations within individuals to be correlated over time, the usual standard error may be incorrect. Thus,

they are replaced in all standard estimations by robust standard errors (Huber-White estimator) with additional correction for the effects of clustered data.

The second model I estimate is a reduced form multi-period multinomial logit with random effect, which combines the logit specification with a different distributional assumption for the heterogeneity terms. Following Skrondal and Rabe-Hesketh (2004), my study captures unobserved heterogeneity by accommodating random effects at the individual level. In particular, a correlated alternative-specific random intercept model with dependence within individuals is introduced. The difference between the standard and random-effects MNL models is that in the latter the choice probability is conditional on random effects in addition to the exogenous variables.

In this case, the utility of individual i that transits out from an atypical contract towards a new state j at time t is expressed as:

$$U_{ijt} = x'_{ijt}\beta_j + \alpha_{ij} + \varepsilon_{ijt}$$

x_{ijt} is a vector of explanatory variables including individual and job-related characteristics as well as a macro-economic indicator. The ε_{ijt} are time-varying i.i.d error terms, while α_{ij} is an individual and job-type specific, time invariant random effect. If the ε_{ijt} follow the type I extreme value distribution, the probability of transition in state j at time t has a multinomial logit form:

$$\theta_{ijt} = \Pr\left(Y_{it} = j|\alpha_{ij}\right) = \frac{\exp\left(x'_{ijt}\beta_j + \alpha_{ij}\right)}{1 + \sum_{j=2}^{J} \exp\left(x'_{ijt}\beta_j + \alpha_{ij}\right)}$$

As in the standard MNL model all effects for the choice $j = 1$ are set to zero. Thus, there are two random effects if the choice equals two and three. The random effects are assumed to follow the binomial distribution and to be independent of the alternative-specific error term.

The unconditional probability is derived by integrating the standard MNL probabilities. In order to obtain the likelihood contribution, it is necessary to integrate out the random term α_{ij} with the corresponding binomial density.

For the parametric estimation, with three possible outcomes, the marginal log-likelihood becomes:

$$\ln L\left(\beta\right) = \sum_{i=1}^{N} \int \sum_{t=1}^{T} \sum_{j=1}^{J} \left[\frac{\exp\left(x'_{ijt}\beta_j + \alpha_{ij}\right)}{1 + \sum_{j=2}^{3} \exp\left(x'_{ijt}\beta_j + \alpha_{ij}\right)} \right]^{y_{ijt}} \phi\left(\alpha_{ij}\right) d\alpha_{ij}$$

This integral does not have a simple closed form solution. Thus, the integral has to be approximated by the numerical integration that is used to integrate over the distributions of the random effects. The approximation is based on summation on a specific number of quadrature points for each dimension of integration. The solution goes over the Q^r quadrature points, with summation replacing the integration over the random effect distribution. The conditional probabilities are obtained by substituting the random effect vector by the current r-dimensional vector of quadrature points B.

Finally, the marginal log-likelihood is maximized by Newton-Raphson method using numerical first and second derivates.

A

3.3 Data and Institutional background

B

3.3.1 Atypical contracts and the Treu Law

In this paper I define as atypical contracts all the contractual forms that do not provide a permanent working relationship: fixed-term contracts (which I cannot identify in my dataset), apprenticeship contracts, CFL and temporary contracts (or interim contracts). Legislation related to atypical contracts is made up by numerous laws introduced since 1955, when the first regulations related to apprenticeship contracts were established. In the past fifty years, legislation regulating atypical contracts was changed; in 2003 the Biagi Law (Law 30/03) provided an important revision of regulation of atypical contracts. In these years, before the introduction of the Biagi Law, the main reform implemented was the Treu reform.

The Treu Law was introduced on June, 24 1997 (law 196/97) with the aim to promote flexibility in the Italian labour market in order to render it more dynamic and to reduce the unemployment rate. The main novelty of the reform consisted in introducing temporary contracts (articles 1 to 11) and in the creation of Temporary Work Agencies (law 469/97), and privatized and decentralized jobcentres. The Treu

Law also modified the sanctionatory discipline of fixed-term contracts (art. 12) and modified the regulation of employment in research sector (art. 14). Finally, it extended the applicability of CFLs to depressed areas and to individuals with invalidity (art. 15), and it raised from 22 to 24 the age limit for the application of apprenticeship contracts (art. 16).

Fixed-term contracts: Fixed-term contracts permit the hiring of workers for a pre-determinate duration. They were introduced in the Italian legislation in 1962 (law 230/62). Recently, the regulation of fixed-term contracts was modified by the law 56/87 and 416/93.

Apprenticeship contracts: The apprenticeship contract is a contractual form which obliges the entrepreneur to give the worker the basic notions in order to transform him in a qualified worker. The legal duration of an apprenticeship contract ranges between 18 months and 4 years, with some exceptions for the sector of handmade commodities. They were introduced with the law 25/55 and were modified until the introduction of Treu reform.

CFL: The CFL were introduced in order to make ease the access to the labour market. They have a determined duration: one year in order to acquire low qualification and two years in order to acquire high qualification. The CFL were introduced in 1984 with the law 863/84, and they were modified with the law 56/87, which extended their applicability to all economic sectors, and with the law 451/94, which rose from 29 to

32 the age limit for their applicability.

Temporary contracts: They were introduced by the Treu Law and law 469/97, according to which jobcentres were privatized and decentralized. TWA employment represents a triangular contract, in which an agency hires a worker for the purpose of making him available for a client firm for a temporary assignment.

3.3.2 Data

The sub-sample used in our analysis is selected by the WHIP (Work Histories Italian Panel) dataset, in its standard version, provided to us by the "Laboratorio Riccardo Revelli" of Turin.

WHIP is a database of individual working histories, based on the INPS (National Institute of Social Security) administrative archives, and consists of a representative sample with a dynamic population of 370.000 individuals. The database includes information from 1985 to 1999, but I used only the information from August 1994 (when law 451/94 was introduced) to 1999; in this way I use a sub-sample which is homogenous from a legislative point of view. With the same aim, I only included individuals aged 16 to 32. The dataset provides monthly information on employment relations, therefore I can reconstruct the time of transitions with good precision.

For each sampled individual, the single employment relations are identified by the contribution rebate type paid to INPS. The employees' contributions give us

information on the contract type for each individual. In particular, in the database, I can distinguish between the contribution rebates relative to permanent contract and three types of contribution rebates related to atypical contracts (CFL, apprenticeship contracts and temporary contracts). It is still not possible to distinguish individuals employed with fixed-term contracts from individuals employed with permanent contracts. Also, people with Co.Co.Co (Continuative Coordinate Collaboration contracts), as these are classified as self-employed by Italian legislation.

The shifts in transition determinants after the Treu Law was introduced, are estimated by comparing the estimates obtained by splitting the original sub-sample into two groups. The first group relates to transitions which took place before the Treu Law was introduced (June 24, 1997), while the second relates to transitions which took place after the reform. This procedure is also justified because the likelihood ratio tests carried out have shown that the best model to fit the data is the one which includes interaction dummies (see the Appendix).

The sample consists of 10135 observations (for 7527 individuals), 4931 included in the first group (with 3644 individuals) and 5204 in the second one (with 3883 individuals). The variables used in the analysis are the following: age, gender, dummies for area of residence, professional dummies, economic sector dummies, tenure, daily wage, part-time dummy, illness dummy, contract duration, and some dummies for previous atypical contract experiences and, finally, the local rate of employment

growth, introduced in order to catch macroeconomic conditions.

In table 7 I present descriptive statistics, divided by period and transition type. 51% of observations belong to the post-reform period. The mean age at which a transition happens is about 21, but it is different with respect to transition type. In particular, the mean age is higher (about 23) for individuals who move from an atypical to a permanent contract and lower for transitions towards a new atypical contract (about 20 years old in the pre-reform period and about 22 in the post-reform period). About 2/3 of observations relate to individuals of male gender. However, observations related to transitions towards a new job are more likely for males, especially in the pre reform period. About 2/3 of observations concern Northern Italy, while only 18% concern the South. About 80% of observations related to transitions towards a new job are counted in Northern Italy, while only 3-4% for the pre reform period and 7-8% in the post reform period are observed in Southern Italy. 65% of observations relate to individuals with apprentice qualification, however the transition towards a new job are relatively more likely for blue or white collar workers. 14% of observation relate to individuals employed in building, while 13% relate to individuals employed in the tourist sector. Average tenure is about 10 months, but it is higher for observations characterized by a transition towards a new job (above all for transition towards a permanent contract, 18 months). This pattern is confirmed for the daily wage variable, which is on average about 42 euros per day. Observations relative to transition towards

a permanent contract are characterized by a higher daily wage (about 48 euro in the pre reform period and about 54 euro in the post reform period); a lower value is observed for transition towards a new job in the pre reform period (35 euro), but a relatively high average daily wage is observed in the post reform period (about 50 euro per day). 5% of observations relate to part-time job relations and 9% of observations are characterized by a period of illness. The mean of atypical contract duration is about 10 months, 10.68 in the pre reform period and 9.24 in the post reform period. Transitions towards a permanent contract are characterized by a higher mean value of the duration variable: 14.26 months in the pre reform period and 12.81 months in the post reform one. 57% of observations are characterized by absence of previous atypical contract experiences, 24% by one previous experience, 11% by two previous experiences and 8% by three or more previous atypical contract experiences. The transitions towards a new job are more likely to be characterized by one or more previous atypical contract experiences, but some differences are noticed with respect to transition type (permanent or new atypical contract) and number of previous experiences. Finally, the macroeconomic indicator (the local employment growth), is negative in the pre reform period (-0.04) and positive in the post reform period (1.13). As expected, the employment growth indicator is higher for transitions towards a job, confirming a positive business cycle effect (or labour demand side effect) on the probability to find a new job immediately.

A

3.4 Results

The transition rates from an atypical contract towards a new state (not-working condition, permanent contract and new atypical contract) can be estimated using probability models with multiple discrete choices. The multinomial logit model is one of the most frequently used due to its relatively computational facility.

The estimates presented are relative to a non-restrict model, which is the parameterization that includes a Treu reform dummy and the relevant interaction dummies, since this solution perform best in fitting the data. In fact, the likelihood ratio tests reject the null hypothesis concerning the equality between restricted and less restricted model (that includes the Treu reform dummy) and the equality between the less restricted and the non-restricted model (see table 9). This justifies the introduction of estimates comparing the pre and post reform situation using two different groups.

In tables 10 and 11 I present the standard MNL model results and its relative marginal effects, where the non-working condition is used as basecategory. The first two columns show results related to the pre reform period while the third and fourth columns report post reform estimates. The Wald test rejects the null hypothesis that all parameters are equal to zero. The usual standard errors are replaced in all estimations by Huber-White robust standard errors with additional correction for the effects of the clustered data. In fact, since some omitted individual characteristics may cause observations within individuals to be correlated over time, the usual standard errors

may be incorrect. In order to identify the factors affecting transition rates, individual and job specific characteristics are examined; in addition, a macroeconomic indicator is included in order to catch demand side effects.

The estimates show a typical inverted U effect for the age variable. In particular, one additional year increases by about 5.5% the probability of transition towards a permanent contract in the pre reform and by about 4% in the post reform. Male gender increases (by about 1% with respect to the probability of transition towards a non-working condition) the probability of obtaining a new job immediately. In general the introduction of the Treu Law has decreased the differences in probabilities associated with gender[1]. As expected, the probability of moving to a new job is higher for workers employed in the North of Italy, and this effect is generally stronger for transitions towards a permanent contract (+1.8% for workers employed in the North-west and +1.4% for workers employed in the North-east ones). As before, the reform seems to have increased the territorial imbalances (respectively +2.5% and +1.8%). Being a blue or white collar worker increases the probability of moving towards a new job compared to being an apprentice, above all for transitions to a permanent job. However, the estimates are rarely significant. The workers employed in building have generally a lower probability of moving towards a new job, but the estimates are not always signif-

[1] In the previous chapter I found an increased gender duality for transitions from a non-working state.

icant; also, to be employed in the tourist sector decreases the probability of transition towards a new job (the estimates are always significant). The Treu law has decreased the negative effect related to transition towards a permanent job (from -3.4% to -2.4%), but it has increased the negative effect related to transitions towards a new atypical contract. As expected, the time spent in previous job (tenure) has a positive effect on the probability of moving to a new job. However, estimates are significant only in the post reform period. In general, the wage, part-time and illness variables have a non-significant effect on the transition rate. A substantially significant and positive effect (except for the transition towards a new AC in the post reform period) is found for the duration variable. As expected, the time spent in current job increases the probability of finding a new job immediately, above all a permanent job. The reform has slightly increased this effect with respect to previous AC experiences, as no monotonic effect is found for the transition towards a permanent contract. However, in general, the transition rate towards a PC is substantially increasing up to two previous experiences, but I find a negative effect for more than two previous experiences. On the contrary, a substantial positive effect is shown with regard to the probability of transition towards a new AC, and it is increased after the introduction of Treu law. Finally, the employment growth variable shows the expected sign (except for the transition towards a PC in pre reform period), confirming a positive effect of the labour demand side.

It is worth emphasizing that the estimation of the standard MNL model is

based on the hypothesis that the probabilities of the alternatives are independent of each other. This property is called the independence from irrelevant alternatives (IIA). The independence assumption follows from the initial assumption that the disturbances are independent, homoscedastic with a generalized extreme value distribution. This assumption implies that adding or deleting alternative outcomes does not affect the odds among the remaining outcomes. In table 9 I provide the results of the Hausman and Small-Hsiao tests to assess the validity of the IIA assumption. The tests do not reject the null hypothesis that the IIA holds for the two alternatives to move towards a PC and a new AC.

The Chow test related to the stability of parameters after the introduction of the Treu Law shows the existence of a structural break for the transitions towards a new atypical contract, while the null hypothesis is not rejected (P value equal 0.183) for the move towards a permanent contract. The observed descriptive statistics for transitions towards a PC show a decrease from 7.31% to 5.41% (i.e. about 1/4 in relative sense), while the transition rate towards a new AC is increased from 2.49% to 4.08% (i.e. about 2/3 in relative sense). Finally the transitions towards a NW condition have remained substantially unchanged. The predicted transitions show lower values for the transition towards a new job, but they confirm the same trend.

As anticipated, the second application of the MNL model consists in a random effect version. This model allows us to relax the IIA assumption and to analyze

unobserved heterogeneity. The critical implication of the independence from IIA assumption is that unobserved factors are assumed to be uncorrelated over alternatives and to have the same variance for all alternatives. The limitations of the independence assumption may be more pronounced when the MNL is applied to a sequence of choices over time, as in our panel dataset, since the observations for the same individual may be influenced by the same individual-specific unobserved heterogeneity. In this case, individuals are thought of as clusters and the dependence between choice decisions by the same individuals is called within-cluster correlation. In other words, observed variables cannot explain all the variability in individuals' decisions, therefore the remaining unobserved heterogeneity may be modelled by introducing individual-level random effects in the model. As unobserved heterogeneity is often thought to induce dependence between choices, this also allows us to relax the IIA assumption. In particular, my results are carried out using a correlated alternative-specific random intercept model with dependence within individuals, which is estimated using the program GLLAMMs (Generalized Linear Latent and Mixed Models) written in STATA by Rabe-Hesketh, Pickles and Skrondal (2004)[2].

In table 12 I report the estimates relative to the random-effect MNL model. Controlling for the unobserved heterogeneity, the previous findings remain substan-

[2]The program GLLAMMs allows me to take in account for correlation between unobserved heterogeneity terms. So, differently from the previous paper, I do not assume that unobserved heterogeneity terms are indipendent.

tially unchanged in terms of sign and significance. On the contrary, the magnitude of many coefficients is greater in the model specification with random-effect than in the specification without random effects. Moreover, the fit of the model is improved; this indicates that there is unobserved heterogeneity at the individual level inducing longitudinal dependence within individuals. The variances of the random effect for the transitions which took place in the pre reform period are higher than for the transitions which took place in the post reform period ones. Furthermore, the variances of the random effect relative to the transitions towards a PC (respectively 1.015 in the pre reform and 0.547 in the post reform period) are smaller than the variances of the transitions towards an AC (respectively 1.251 and 0.817). There is a positive and strong correlation between the random effects for the transitions towards a PC or a new AC, both in the pre reform period and in the post reform one. This seems to suggest that those individuals that move towards a permanent contract rather than move to a NW condition, are also likely to move towards a new atypical job.

In table 8a I show the observed transition rates conditioned to the number of previous AC experiences, comparing the pre and post reform situations. As anticipated, the probability of moving to a permanent contract increases if previous experiences of AC are up to two, but it clearly decreases when previous experiences are more than two. At the same time, the transition rate towards a new atypical contract increases with the number of AC previous experiences. These trends are confirmed both for the

pre reform period and for the post reform one. However, a decrease in transition rate towards a PC can be noticed at least with respect to the AC previous experiences. This phenomenon is accentuated for two or more previous AC experiences. Anyway, an opposite trend is found for individuals who move towards a new atypical contract. In fact, the post reform period is characterized by a substantial increase in transitions to this contractual form. Finally, the transitions towards a NW condition show only a little reduction; however, the probability of moving towards a non-employment state is smaller if the worker has had previous AC experiences. These evidences seem to show that the Treu Law, at least until 1999, has had only a small effect on the probability of moving towards a new job after an atypical job experience and, at the same time, that it is more likely that the new job is non-permanent. However, a heterogeneous effect is found with respect to some personal characteristics, as showed in table 8b. In particular, after the introduction of the Treu Law, the probability to move towards a NW state decreases for Southern workers contrary to what happens in the remaining areas of Italy. Besides, both the transition rate towards a PC and towards a new AC appears to increase. With respect to the gender variable, the post reform period is characterized by an improvement for females and a worsening for males in terms of flows towards a NW state or a new job. At the same time, in the post reform years the transition rate towards a NW state is decreased for apprentices and, above all, for white collar workers. In the latter case the probability to move towards a new AC has

grown considerably. Finally, a worsening is noticed for the conditions of blue collar workers.

In table 9 I show the observed transitions starting from a non-employment state. As expected the introduction of the Treu Law, has strongly increased the transitions to an atypical contract and it has reduced transitions to a permanent job ones. In the post-reform period the probability of transitions to an atypical job has increased on average, meanly, about 60% (from 16.5% to 26.5%), while the transitions towards a stable job has decreased about 12% (from 83.5% to 73.5%). A heterogeneous growth rate of the transitions towards an atypical contract is found. A stronger increase of it is related to workers with more of 24 years old (+85%) and for female workers (+81.5%). Larger increases are found for north-western and southern workers (respectively +73% and +75%), while a lower increase is found for north-eastern workers (+47%). However, in the North-east area also is found the highest absolute transition rate towards an atypical job (about 1/3 on the total transitions). The reform has strongly affected the transition rates toward an AC for the blue collar (+81%) and, above all, for the white collar (+128%). In the post-reform period, the probability to move towards a non-permanent job has considerably increased for workers without previous AC experiences (+114%), while it has increased about 40%-50% for the workers with previous AC experiences. However, the absolute transition rate is relatively low for the workers without previous AC experiences (about 16%) also in the post-reform period, while it is larger

for workerswith previous AC experience (about 35%). Finally, related to the duration of the non-working state, the highest growth is found for very short-term unemployed (duration between 0-6 months, +70%) and for extremely long-term unemployed (more of 18 months of duration, +69%).

3.5 Conclusions

In this paper I estimate the flows from an atypical contract towards a new state (non-employment, permanent contract or a new atypical contract), evaluating the effects of the Treu Law on this phenomenon. With this aim, I use a sub-sample, made up of young individuals (aged between 16 and 32) working with an atypical contract, extracted from the WHIP dataset which provides information on individual working histories. I carry out my analysis by applying two versions of Multinomial Logit Model: the standard one, based on the IIA assumption, and the random-effects version that allows to consider the possibility of unobserved heterogeneity and to relax the IIA assumption.

Both the standard MNL model and the random-effects one show that the transition rates are affected by several (personal and idiosyncratic) variables, i.e. age, gender, working area, economic sector, contract duration and, relatively, number of previous atypical contract experiences and qualification. In particular, the probability of moving to a new job increases with age and is higher for men and for individuals living in Northern areas. Individuals who work in the tourist sector are more likely to move

to a non-working state. Increased contract lenght increases the probability of finding a new job immediately, above all a new job of a permanent type. Finally, the number of previous AC experiences monotonically increases the probability of moving towards a new atypical job, while a non-monotonic effect is found with respect to transitions towards a PC. In particular, the transition rate to a PC increases until two previous experiences but decreases for three or more of them. The introduction of the Treu Law has reduced age, gender and territorial differences. The flow to the non-working state seems to be decreased only for Southern workers and for white-collar workers.

The Chow test relative to the stability of parameters shows the existence of a structural break for the transitions towards a new atypical contract (before and after) the introduction of the Treu Law. The probability of transition towards a NW state has remained substantially unchanged, while a decrease in the probability of transition to a PC is generally found. Finally, as expected, the labour demand indicator shows a positive effect on the probability of moving towards a new job. The random-effects model specification shows that there is unobserved heterogeneity at the individual level inducing longitudinal dependence within individuals.

The results induce one to think that the previous AC experiences do not constitute a trap to a permanent contract. However, their increased number raises the probability to move towards an AC job rather that towards a PC. In fact I find a negative effect for more than two previous experiences. The probability of finding

a new job is positively correlated with the contract lenght, suggesting the presence of a "human capital accumulation" effect. A positive and strong correlation is found between the random effects for the transition towards a PC or a new AC, both in the pre reform period and in the post reform one. This seems to suggest that those individuals that move towards a permanent contract rather than move to a NW condition, are also likely to move towards a new atypical job.

The introduction of the Treu Law seems to have involved only a very small decrease in the probability of transition towards a non-employment state, at least until 1999, therefore its main effect on workers with atypical contracts consist in the nature of new job type after the current atypical contract. As anticipated, in the post reform period the probability of moving to a new atypical job has increase and the transition rate to a permanent contract has decreased. This seems to imply a trade-off between the employment growth, evidenced in the post reform period, and job stability.

The increase of atypical job opportunities, due to the introduction of the Treu Law, has determinated a strong increase in transitions to an atypical contract starting from a non-employment position. The largest effect is found for workers with more of 24 years old, women, white collars and for the individual without previous AC experiences. Therefore, even if the absolute value of transition rates, remain higher for younger workers and with previous AC experiences ones, the Treu Law seem to have reduced the duality due to some characteristics.

Finally, in order to increase the probability of reaching a stable job, policy recommendations include promotion of longer atypical contracts and assistance to disadvantages workers, i.e. women, southern workers and low qualified.

CT

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Tables and figures

Table 1. Atypical contract legislation in Italy

Year	Law	Contents
1955	n. 25	Introduction of apprenticeship contracts;
1962	n. 230	Introduction of fixed-term contracts;
1973	c.p.c. 409	Discipline on trial, fiscal and social security related to collaboration contracts;
1983	n. 79	Extension of fixed-term contracts to all economic sectors;
1984	n. 863	Enlargement of part-time criteria; Introduction of CFL;
1987	n. 56	Extension of CFL to all economic sectors; Modifications to fixed-term contract legislation;
1994	n. 236	Stage contracts in apprenticeship;
1994	n. 451	Increase in the limit of age for CFL applicability;
1995	n. 335	Reform of compulsory and complementary social security system;
1997	n. 196 (Treu Law)	Introduction of temporary contracts (art. 1-11); Modification of sanctionary discipline of fixed-term contract (art. 12); Employment in research (art. 14); Variation of CFL applicability fro undeveloped area and invalids (art. 15); Extension of applicability of apprenticeship contracts (art.16);
1997	n. 469	Privatization and decentralization of jobcentre;
2001	d.lgs. n. 368	Extension of applicability of fixed-term contracts;
2003	n. 30	Introduction of the Biagi Law;

Table 2. Macroeconomic indicators in some European countries

		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
UE15	urate	10.0%	10.4%	10.0%	10.1%	9.8%	9.3%	8.5%	7.6%	7.2%	7.6%	8.0%	8.1%
	Young urate	21.4%	21.8%	21.0%	21.2%	20.6%	19.0%	17.1%	15.3%	15.1%	15.6%	16.3%	16.6%
	LTU	44.0%	48.1%	49.0%	48.5%	49.0%	47.3%	45.9%	44.7%	43.1%	40.8%	41.3%	42.0%
	AC	11.0%	11.5%	12.0%	12.0%	12.4%	13.0%	13.4%	13.7%	13.5%	13.1%	13.1%	13.6%
UE25	urate						9.5%	9.1%	8.6%	8.4%	8.7%	9.0%	9.0%
	Young urate						19.4%	18.4%	17.4%	17.6%	18.1%	18.6%	18.7%
	LTU						47.4%	45.1%	45.3%	45.2%	44.8%	44.4%	45.6%
	AC					9.3%	8.9%	8.7%	8.4%	8.0%	8.2%	8.4%	8.3%
Italy	urate	10.1%	10.6%	11.2%	11.2%	11.3%	11.3%	10.9%	10.1%	9.1%	8.6%	8.4%	8.0%
	Young urate	30.1%	29.1%	30.3%	30.4%	30.2%	29.9%	28.7%	27.0%	24.1%	23.1%	23.7%	23.6%
	LTU	56.4%	61.3%	63.4%	65.2%	64.6%	59.3%	61.5%	62.4%	62.6%	59.3%	58.3%	50.0%
	AC	6.2%	6.8%	7.4%	7.4%	7.9%	8.6%	9.5%	10.1%	9.8%	9.9%	9.9%	11.8%
Germany	urate	7.7%	8.3%	8.0%	8.5%	9.1%	8.8%	7.9%	7.2%	7.4%	8.2%	9.0%	9.5%
	Young urate	15.0%	15.6%	14.9%	15.6%	16.2%	15.0%	12.7%	10.6%	12.8%	14.2%	14.7%	15.1%
	LTU	40.3%	44.6%	48.8%	48.2%	50.5%	51.1%	51.9%	51.4%	50.0%	47.6%	50.0%	51.6%
	AC	10.3%	10.4%	10.5%	11.2%	11.8%	12.4%	13.1%	12.7%	12.4%	12.0%	12.2%	12.4%
France	urate	11.1%	11.7%	11.1%	11.6%	11.5%	11.1%	10.5%	9.1%	8.4%	8.9%	9.5%	9.7%
	Young urate	27.1%	28.6%	27.0%	28.5%	28.4%	25.6%	23.4%	20.1%	19.4%	20.0%	21.1%	22.0%
	LTU	35.1%	38.5%	39.6%	38.8%	40.9%	40.5%	39.0%	38.5%	35.7%	34.8%	38.9%	40.2%
	AC	10.9%	11.5%	12.4%	12.8%	13.4%	13.9%	14.5%	15.2%	14.6%	13.5%	12.7%	12.8%
Spain	urate	18.6%	19.8%	18.8%	18.2%	17.1%	15.3%	12.9%	11.5%	10.7%	11.5%	11.5%	11.0%
	Young urate	38.4%	40.2%	37.8%	37.2%	34.6%	31.3%	25.8%	22.9%	21.7%	22.3%	22.7%	22.1%
	LTU	49.5%	55.6%	55.9%	52.7%	52.0%	50.3%	45.7%	41.7%	36.4%	33.9%	33.9%	31.8%
	AC	33.0%	34.2%	35.2%	33.8%	33.5%	33.0%	32.9%	32.2%	32.2%	31.8%	31.8%	32.5%
UK	urate	10.0%	9.3%	8.5%	8.0%	6.9%	6.2%	5.9%	5.4%	5.0%	5.1%	4.9%	4.7%
	Young urate	17.6%	16.4%	15.3%	15.0%	13.7%	13.1%	12.8%	12.3%	11.9%	12.1%	12.3%	12.1%
	LTU	42.0%	44.1%	42.4%	38.8%	36.2%	30.6%	28.8%	25.9%	26.0%	21.6%	22.4%	21.3%
	AC	6.3%	6.9%	7.2%	7.3%	7.6%	7.3%	7.0%	6.9%	6.7%	6.4%	6.1%	6.0%

Source: European Commission, Employment in Europe in 2005

Table 3. Evolution of share of new atypical contracts stipulated, by years and population groups

	Area			Gender		Qualification		All
Year	North-west	North-east	South-islands	Male	Female	Low-skills	High-skills	
<= 1985	9.34%	13.03%	11.95%	12.06%	10.33%	15.23%	1.50%	11.43%
1995	20.91%	27.08%	17.97%	23.51%	20.65%	24.91%	11.44%	22.51%
1996	20.30%	28.76%	18.22%	23.97%	21.04%	25.12%	13.37%	22.94%
1997	20.90%	28.28%	20.09%	24.94%	20.90%	25.93%	14.27%	23.45%
1998	27.75%	35.09%	29.45%	31.98%	29.91%	33.93%	21.93%	31.19%
1999	32.29%	34.08%	25.44%	30.32%	32.15%	32.86%	24.56%	31.00%
growth rate 85-99	245.71%	161.54%	112.90%	151.44%	211.22%	115.77%	1537.30%	171.25%
growth rate 95-99	54.39%	25.85%	41.56%	28.99%	55.72%	31.95%	114.65%	37.74%

Source: my elaboration on WHIP dataset

Table 4. Descriptive Statistics by origin state (Chapter 2)

	Pre-reform								Post-reform							
	All (obs. 94160)		PC (obs. 37614)		AC (obs. 14622)		NW (obs. 41924)		All (obs. 43675)		PC (obs. 16647)		AC (obs. 7485)		NW (obs. 19543)	
Variables	Mean	s.e.	Mean	s.e.	Mean	s.e.	Mean	s.e.	Mean	s.e.	Mean	s.e.	Mean	s.e.	Mean	s.e.
Age	22.15	4.16	23.17	3.87	18.95	3.21	22.35	4.15	24.25	4.30	25.32	3.88	21.60	3.97	24.36	4.33
Male	0.65	0.48	0.64	0.48	0.67	0.47	0.65	0.48	0.62	0.49	0.62	0.49	0.63	0.48	0.62	0.49
North-West	0.28	0.45	0.30	0.46	0.28	0.45	0.27	0.44	0.30	0.46	0.32	0.47	0.30	0.46	0.29	0.45
North-East	0.31	0.46	0.28	0.45	0.37	0.48	0.31	0.46	0.29	0.45	0.27	0.44	0.33	0.47	0.30	0.46
Centre	0.18	0.38	0.18	0.38	0.17	0.38	0.18	0.38	0.19	0.39	0.18	0.39	0.19	0.39	0.20	0.40
South-Islands	0.23	0.42	0.24	0.43	0.17	0.37	0.25	0.43	0.22	0.41	0.23	0.42	0.19	0.39	0.22	0.42
Blue collar	0.82	0.38	0.76	0.42	0.91	0.28	0.84	0.36	0.79	0.41	0.74	0.44	0.84	0.36	0.81	0.39
White collar	0.18	0.38	0.24	0.42	0.09	0.28	0.16	0.36	0.21	0.41	0.26	0.44	0.16	0.36	0.19	0.39
Buildings	0.15	0.36	0.15	0.35	0.15	0.36	0.16	0.37	0.12	0.32	0.11	0.31	0.12	0.32	0.12	0.33
Tourism	0.17	0.37	0.16	0.37	0.13	0.34	0.18	0.39	0.15	0.35	0.14	0.34	0.11	0.31	0.17	0.38
Other sectors	0.68	0.47	0.69	0.46	0.71	0.45	0.66	0.47	0.74	0.44	0.75	0.43	0.77	0.42	0.71	0.45
Wage	45.71	40.88	52.09	43.79	34.81	35.36	43.79	38.93	53.65	49.10	57.06	54.37	43.64	28.53	54.58	50.08
Part-time	0.08	0.26	0.10	0.30	0.03	0.16	0.07	0.26	0.13	0.33	0.15	0.36	0.07	0.26	0.12	0.33
Tenure	19.86	25.96	19.70	26.77	6.89	14.26	24.52	26.82	27.77	34.93	28.97	36.38	12.51	22.51	32.59	35.95
Zero AC exp	0.58	0.49	0.68	0.47	0.63	0.48	0.48	0.50	0.58	0.49	0.66	0.47	0.60	0.49	0.50	0.50
One AC exps	0.25	0.44	0.19	0.39	0.23	0.42	0.32	0.47	0.24	0.43	0.19	0.39	0.23	0.42	0.29	0.45
Two AC exps	0.10	0.30	0.08	0.26	0.09	0.29	0.12	0.33	0.10	0.30	0.08	0.28	0.10	0.30	0.12	0.32
Three AC exps	0.06	0.24	0.05	0.22	0.06	0.23	0.08	0.27	0.08	0.27	0.07	0.25	0.07	0.26	0.09	0.29
First contract	0.51	0.50	0.68	0.47	0.11	0.31	0.51	0.50	0.54	0.50	0.67	0.47	0.21	0.41	0.55	0.50
Empl. Growth	-0.02	1.01	0.02	0.96	0.13	0.97	-0.11	1.05	0.85	0.17	0.85	0.17	0.87	0.16	0.84	0.17

Source: my elaboration on WHIP dataset

Table 5a. MPH model hazard rate estimates with unobserved heterogeneity (Pre-reform)

	PC-PC			PC-AC			PC-NW			AC-PC			AC-AC			AC-NW			NW-PC			NW-AC		
covariates	b	s.e		b	s.e		b	s.e		b	s.e		b	s.e		b	s.e		b	s.e		b	s.e	
age	0.54	0.05	***	0.41	0.21	**	0.22	0.02	***	0.89	0.11	***	-0.34	0.17	**	0.19	0.03	***	0.46	0.02	***	-0.59	0.04	***
age square	-0.01	0.00	***	-0.01	0.00	**	0.00	0.00	***	-0.02	0.00	***	0.01	0.00		-0.01	0.00	***	-0.01	0.00	***	0.01	0.00	***
male	0.31	0.05	***	0.87	0.19	***	0.04	0.02	**	0.26	0.08	***	0.43	0.12	***	0.03	0.02		0.02	0.02		0.14	0.03	***
north-west	0.31	0.06	***	0.25	0.23		-0.11	0.02	***	0.62	0.10	***	0.34	0.16	**	0.01	0.03		0.19	0.02	***	0.17	0.05	***
north-east	0.25	0.06	***	0.74	0.23	***	0.07	0.02	***	0.24	0.10	**	0.55	0.15	***	0.19	0.03	***	0.19	0.02	***	0.31	0.04	***
south-islands	-0.45	0.07	***	-0.91	0.31	***	0.16	0.02	***	-1.12	0.17	***	-0.87	0.22	***	-0.05	0.03	*	-0.12	0.02	***	-0.57	0.05	***
blue collar	0.01	0.05		0.26	0.22		0.21	0.02	***	-0.19	0.10	*	-0.03	0.26		-0.02	0.04		-0.04	0.02	*	0.07	0.05	
building	0.26	0.05	***	0.01	0.21		0.31	0.02	***	-0.17	0.10	*	-0.28	0.15	**	0.07	0.03	**	0.00	0.02		-0.08	0.04	**
tourism	-0.17	0.07	**	-0.94	0.33	***	0.78	0.02	***	-0.69	0.19	***	-0.59	0.23	***	0.67	0.03	***	0.18	0.02	***	-0.27	0.04	***
wage	0.00	0.00	***	-0.02	0.00	***	-0.01	0.00	***	0.00	0.00	***	-0.04	0.01	***	-0.02	0.00	***	0.00	0.00	***	0.00	0.00	***
part-time	0.04	0.07		0.51	0.27	*	0.10	0.03	***	-0.49	0.23	**	-0.34	0.52		0.06	0.06		-0.18	0.03	***	-0.09	0.07	
tenure	0.00	0.00	**	-0.01	0.00	*	-0.01	0.00	***	0.00	0.00	**	0.00	0.00		-0.01	0.00	***	-0.01	0.00	***	-0.02	0.00	***
1 AC exp	-0.27	0.06	***	-0.29	0.27		-0.35	0.03	***	-1.24	0.10	***	-0.70	0.14	***	-0.73	0.04	***	-0.24	0.02	***	0.22	0.06	***
2 AC exp	-0.25	0.08	***	-0.46	0.36		-0.38	0.04	***	-1.27	0.13	***	-1.02	0.22	***	-0.72	0.07	***	-0.29	0.03	***	0.00	0.07	
3+ AC exp	-0.16	0.10	*	0.27	0.35		-0.32	0.04	***	-1.35	0.16	***	-0.53	0.24	**	-0.69	0.08	***	-0.11	0.04	***	-0.07	0.09	
first contract	-0.31	0.06	***	-0.37	0.25		-0.26	0.03	***	0.65	0.10	***	0.57	0.19	***	0.25	0.03	***	0.02	0.02		-0.56	0.06	***
empl growth	-0.13	0.02	***	-0.16	0.07	**	-0.11	0.01	***	0.01	0.04		-0.06	0.05		-0.06	0.01	***	-0.01	0.01	*	0.02	0.01	
constant	-12.02	0.61	***	-11.44	2.41	***	-4.57	0.23	***	-16.64	1.19	***	-1.46	1.79		-3.91	0.34	***	-8.71	0.22	***	3.99	0.43	***
log-likelihood	-9730.9			-1148.7			-37913.4			-2874.1			-1915.5			-17581.8			-33177.3			-18670.5		
observations	37614												14622						41924					
individuals	18741												9571						18313					
failures	3340			193			23351			898			457			11647			25949			7256		

Source: my elaboration on WHIP dataset

Table 5b. MPH model hazard rate estimates with unobserved heterogeneity (Post-reform)

	PC-PC			PC-AC	PC-NW			AC-PC			AC-AC			AC-NW			NW-PC			NW-AC		
covariates	b	s.e			b	s.e		b	s.e		b	s.e		b	s.e		b	s.e		b	s.e	
age	0.35	0.14	***		-0.25	0.04	***	0.89	0.22	***	0.59	0.24	***	-0.26	0.04	***	0.52	0.04		0.10	0.05	
age square	-0.01	0.00	**		0.00	0.00	***	-0.02	0.00	***	-0.01	0.01	***	0.01	0.00	***	-0.01	0.00	***	0.00	0.00	***
male	0.11	0.09			-0.06	0.03	**	0.48	0.17	***	-0.16	0.16		0.08	0.04	**	0.19	0.03	***	0.03	0.04	
north-west	0.13	0.11			-0.14	0.04	***	0.57	0.22	***	0.61	0.25	**	-0.09	0.05	*	0.24	0.04	***	0.14	0.05	**
north-east	0.05	0.11			0.05	0.04		0.69	0.22	***	0.77	0.25	***	0.08	0.05		0.32	0.04	***	0.20	0.05	***
south-islands	-0.78	0.14	***		0.05	0.04		-1.16	0.37	***	-0.47	0.35		-0.14	0.06	**	-0.20	0.04	***	-0.46	0.07	***
blue collar	0.42	0.10	***		0.43	0.03	***	0.29	0.22		-0.09	0.23		0.31	0.07	***	-0.19	0.03	***	-0.14	0.06	**
building	0.12	0.12			0.33	0.04	***	-0.56	0.27	**	-0.24	0.26		0.18	0.05	***	-0.13	0.04	***	-0.19	0.06	***
tourism	0.03	0.13		do not	0.73	0.03	***	-0.06	0.30		-0.37	0.32		0.86	0.05	***	0.09	0.04	**	-0.50	0.06	***
wage	0.00	0.00		converge	0.00	0.00	***	0.00	0.00		0.00	0.00	***	0.00	0.00	***	0.00	0.00		0.00	0.00	**
part-time	-0.12	0.12			0.09	0.03	***	0.25	0.29		-0.11	0.33		0.06	0.07		-0.27	0.04	***	-0.27	0.07	***
tenure	0.00	0.00			-0.01	0.00	***	0.01	0.00	***	0.00	0.00		-0.01	0.00	***	0.00	0.00	***	0.00	0.00	***
1 AC exp	0.22	0.13	*		-0.11	0.05	**	-0.13	0.19		-0.05	0.20		-0.07	0.05		-0.10	0.04	**	0.70	0.07	***
2 AC exp	0.40	0.16	***		-0.09	0.06		0.15	0.23		0.47	0.23	**	-0.04	0.06		-0.04	0.06		0.80	0.09	***
3+ AC exp	0.43	0.18	**		0.01	0.07		-0.07	0.26		0.35	0.27		0.04	0.07		-0.03	0.06		0.86	0.09	***
first contract	0.19	0.13			-0.06	0.04		-0.44	0.19	**	0.21	0.20		0.03	0.05		0.04	0.04		0.06	0.07	
empl growth	0.28	0.21			0.12	0.07	*	-0.80	0.41	**	-0.51	0.42		-0.44	0.10	***	0.17	0.07	**	0.55	0.10	***
constant	-11.24	1.80	***		0.57	0.47		-17.49	2.60	***	-12.13	2.61	***	0.51	0.50		-9.98	0.46	***	-4.19	0.58	***
log-likelihood	-3295.5				-18264.9			-933.4			-902.9			-7998.0			-19386.9			-9148.5		
observations				16647							7485								19543			
individuals				12902							6334								14538			
failures	770				7846			197			184			3251			8029			2968		

Source: my elaboration on WHIP dataset

Table 6a. Duration dependence without Unobserved Heterogeneity

	Duration dependence parameter			
	Pre-reform		Post-reform	
Transition	estimate	s.e.	estimate	s.e.
PC-PC	1.24	0.02	1.09	0.03
PC-AC	0.99	0.06	0.98	0.06
PC-NW	0.80	0.00	0.86	0.01
AC-PC	1.54	0.04	1.10	0.06
AC-AC	1.24	0.05	1.08	0.06
AC-NW	1.02	0.01	0.89	0.01
NW-PC	0.97	0.01	0.86	0.01
NW-AC	0.80	0.01	0.92	0.01

Baseline hazard: Weibull specification
Source: my elaboration on WHIP dataset

Table 6b. Duration dependence with Unobserved Heterogeneity

	Duration dependence parameter				Unobserved Heterogeneity			
	Pre-reform		Post-reform		Pre-reform		Post-reform	
Transition	estimate	s.e.	estimate	s.e.	estimate	s.e.	estimate	s.e.
PC-PC	1.26	0.02	1.09	0.03	0.47	0.06	1.04	0.24
PC-AC	1.00	0.06	-	-	1.84	1.41	-	-
PC-NW	0.82	0.00	0.89	0.01	0.15	0.01	0.19	0.03
AC-PC	1.54	0.04	1.10	0.07	0.00	0.00	0.00	0.00
AC-AC	1.29	0.05	1.08	0.07	0.83	0.33	0.00	0.01
AC-NW	1.03	0.02	0.89	0.01	0.01	0.02	0.00	0.00
NW-PC	1.00	0.01	0.89	0.01	0.17	0.01	0.39	0.03
NW-AC	0.94	0.01	0.92	0.02	0.70	0.05	0.01	0.06

Baseline hazard: Weibull specification, Unobserved Heterogeneity: Gamma distributed
Source: my elaboration on WHIP dataset

Table 7. Descriptive statistics (Chapter 3)

	All (obs. 10135)		Pre-reform (obs. 4931)								Post-reform (obs. 5204)							
			All		NW		PC		AC		All		NW		PC		AC	
Covariates	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.
Age	21.04	3.73	20.62	3.51	20.49	3.50	22.60	3.18	19.69	2.94	21.44	3.88	21.28	3.87	23.55	3.58	21.94	3.62
Male	0.66	0.47	0.67	0.47	0.67	0.47	0.73	0.44	0.76	0.43	0.65	0.48	0.65	0.48	0.69	0.46	0.62	0.49
North-west	0.28	0.45	0.27	0.44	0.26	0.44	0.37	0.48	0.33	0.47	0.30	0.46	0.29	0.46	0.42	0.49	0.34	0.47
North-east	0.39	0.49	0.38	0.49	0.38	0.48	0.42	0.49	0.49	0.50	0.39	0.49	0.39	0.49	0.41	0.49	0.49	0.50
Centre	0.15	0.35	0.18	0.38	0.18	0.38	0.18	0.39	0.14	0.35	0.12	0.33	0.12	0.33	0.10	0.29	0.09	0.29
South-islands	0.18	0.38	0.17	0.38	0.19	0.39	0.03	0.17	0.04	0.20	0.18	0.39	0.20	0.40	0.07	0.26	0.08	0.27
Apprentice	0.65	0.48	0.64	0.48	0.66	0.47	0.38	0.49	0.72	0.45	0.65	0.48	0.67	0.47	0.44	0.50	0.59	0.49
Blue collar	0.26	0.44	0.28	0.45	0.26	0.44	0.48	0.50	0.25	0.44	0.24	0.42	0.23	0.42	0.37	0.48	0.24	0.43
White collar	0.10	0.30	0.08	0.27	0.08	0.27	0.14	0.35	0.03	0.18	0.12	0.32	0.11	0.31	0.19	0.39	0.17	0.38
Buildings	0.14	0.35	0.15	0.36	0.15	0.36	0.14	0.35	0.20	0.41	0.13	0.34	0.14	0.35	0.09	0.28	0.11	0.31
Tourism	0.13	0.33	0.12	0.32	0.13	0.33	0.02	0.15	0.02	0.12	0.14	0.34	0.15	0.36	0.04	0.20	0.04	0.20
Other sectors	0.73	0.44	0.73	0.44	0.72	0.45	0.83	0.37	0.78	0.42	0.73	0.44	0.71	0.45	0.87	0.34	0.85	0.36
Tenure	10.69	20.37	10.49	19.52	9.79	18.85	18.56	25.33	11.50	18.15	10.88	21.14	9.85	19.95	22.87	30.61	15.76	23.56
Daily wage	42.00	36.19	39.55	26.66	38.98	26.74	47.93	27.72	35.03	13.17	44.32	43.20	43.41	39.57	54.07	70.02	49.59	61.10
Part-time	0.05	0.22	0.03	0.18	0.03	0.18	0.04	0.18	0.02	0.12	0.06	0.24	0.06	0.24	0.07	0.25	0.05	0.21
Illness	0.09	0.28	0.09	0.29	0.09	0.28	0.14	0.35	0.10	0.30	0.08	0.28	0.08	0.28	0.10	0.29	0.08	0.27
Duration	9.94	12.07	10.68	12.61	10.38	12.53	14.26	13.77	10.92	10.31	9.24	11.49	8.98	11.34	12.81	14.51	9.83	9.23
No AC previous experiences	0.57	0.50	0.56	0.50	0.57	0.50	0.48	0.50	0.45	0.50	0.57	0.49	0.58	0.49	0.49	0.50	0.48	0.50
One AC experience	0.24	0.43	0.24	0.43	0.24	0.43	0.22	0.42	0.29	0.46	0.24	0.43	0.24	0.43	0.25	0.43	0.24	0.43
Two AC experiences	0.11	0.31	0.11	0.31	0.10	0.31	0.18	0.39	0.10	0.30	0.11	0.31	0.10	0.30	0.17	0.37	0.15	0.35
Three or more AC experiences	0.08	0.28	0.09	0.28	0.08	0.28	0.11	0.31	0.16	0.37	0.08	0.27	0.08	0.26	0.10	0.29	0.13	0.34
Employment growth	0.56	1.01	-0.04	0.99	-0.07	1.01	0.19	0.75	0.22	0.79	1.13	0.63	1.12	0.63	1.22	0.58	1.26	0.57
Reform	0.51	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Source: my elaboration on WHIP data

Table 8a. Observed transitions by number of previous AC experiences

Number of previous	PRE REFORM				POST REFORM			
AC experiences	NW	PC	AC	TOTALE	NW	PC	AC	TOTAL
zero	2527	177	57	2761	2720	147	116	2983
one	1072	83	37	1192	1111	76	58	1245
two	462	68	13	543	475	51	35	561
three or more	374	41	20	435	354	29	32	415
TOTALE	4435	369	127	4931	4660	303	241	5204

Source: my elaboration on WHIP data

Table 8b. Observed transitions by area, gender and qualification

	PRE REFORM				POST REFORM			
	NW	PC	AC	TOTAL	NW	PC	AC	TOTAL
				Area				
North-west	1136	136	42	1314	1366	127	81	1574
North-east	1677	155	62	1894	1801	125	119	2045
Centre	781	67	18	866	579	29	22	630
South-islands	841	11	5	857	914	22	19	955
				Gender				
Female	1477	98	30	1605	1647	95	91	1833
Male	2958	271	97	3326	3013	208	150	3371
				Qualification				
Apprentice	2931	141	91	3163	3101	134	142	3377
Blue-collar	1155	176	32	1363	1060	111	57	1228
White-collar	349	52	4	405	499	58	42	599

Source: my elaboration on WHIP data

Table 9. Observed transitions from a non-working state by some characteristics

	Atypical Job				Permanent Job				Growth rate	
	Pre-reform		Post-reform		Pre-reform		Post-reform		Atypical Job	Permanent Job
Age										
≤24	2089	*25.17%*	3137	*41.56%*	6211	*74.83%*	4411	*58.44%*	*65.13%*	*-21.91%*
>24	586	*7.20%*	1190	*13.32%*	7549	*92.80%*	7742	*86.68%*	*84.95%*	*-6.59%*
Gender										
Women	792	*13.66%*	1495	*24.81%*	5005	*86.34%*	4532	*75.19%*	*81.56%*	*-12.91%*
Men	1883	*17.70%*	2832	*27.09%*	8755	*82.30%*	7621	*72.91%*	*53.06%*	*-11.41%*
Area										
North-west	621	*14.35%*	1,151	*24.86%*	3708	*85.65%*	3,479	*75.14%*	*73.30%*	*-12.28%*
North-east	1,076	*21.55%*	1,530	*31.61%*	3918	*78.45%*	3,310	*68.39%*	*46.72%*	*-12.83%*
Centre	455	*16.76%*	771	*27.05%*	2259	*83.24%*	2,079	*72.95%*	*61.36%*	*-12.36%*
South-islands	424	*12.03%*	714	*21.08%*	3100	*87.97%*	2,673	*78.92%*	*75.21%*	*-10.29%*
Qualification										
Apprenticeship	1358	*48.69%*	1855	*63.64%*	1431	*51.31%*	1060	*36.36%*	*30.69%*	*-29.13%*
Blue-collar	1016	*9.85%*	1789	*17.88%*	9295	*90.15%*	8217	*82.12%*	*81.45%*	*-8.90%*
White-collar	202	*8.21%*	522	*18.74%*	2259	*91.79%*	2264	*81.26%*	*128.27%*	*-11.47%*
Previous atypical contract experiences										
zero	615	*7.70%*	1,326	*16.47%*	7369	*92.30%*	6,724	*83.53%*	*113.84%*	*-9.50%*
one	1172	*24.25%*	1,737	*36.02%*	3660	*75.75%*	3,085	*63.98%*	*48.52%*	*-15.54%*
two	516	*25.41%*	713	*35.02%*	1515	*74.59%*	1,323	*64.98%*	*37.84%*	*-12.89%*
three or more	372	*23.43%*	551	*35.05%*	1216	*76.57%*	1,021	*64.95%*	*49.63%*	*-15.18%*
Duration										
zero-six	1,127	*14.71%*	1,978	*24.97%*	6,537	*85.29%*	5,945	*75.03%*	*69.77%*	*-12.03%*
seven-twelve	748	*20.22%*	1,127	*29.66%*	2,952	*79.78%*	2,673	*70.34%*	*46.70%*	*-11.83%*
thirteen-eighty	275	*20.46%*	391	*30.79%*	1,069	*79.54%*	879	*69.21%*	*50.47%*	*-12.98%*
more of eighty	525	*14.09%*	831	*23.83%*	3,202	*85.91%*	2,656	*76.17%*	*69.18%*	*-11.34%*
Total	2576	*16.55%*	4166	*26.52%*	12985	*83.45%*	11541	*73.48%*	*60.22%*	*-11.95%*

Source: my elaboration on WHIP data

Table 10. Standard MNL model estimates

	PRE REFORM						POST REFORM					
	PC vs NW			AC vs NW			PC vs NW			AC vs NW		
covariates	b	s.e		b	s.e		b	s.e		b	s.e	
age	1.336	0.237	***	-0.322	0.349		1.108	0.206	***	0.525	0.230	**
age square	-0.027	0.005	***	0.004	0.008		-0.022	0.004	***	-0.012	0.005	**
male	0.299	0.135	**	0.270	0.242		0.278	0.134	**	-0.078	0.150	
north-west	0.410	0.163	**	0.288	0.293		0.614	0.218	***	0.428	0.260	*
north-east	0.328	0.173	*	0.222	0.291		0.483	0.222	**	0.568	0.248	**
south-islands	-1.972	0.335	***	-1.290	0.484	***	-0.696	0.294	**	-0.433	0.324	
blue collar	0.390	0.189	**	0.517	0.318		0.146	0.190		0.008	0.190	
white collar	0.376	0.244		0.048	0.546		0.217	0.215		0.450	0.240	*
buildings	-0.186	0.162		0.147	0.230		-0.558	0.220	**	-0.261	0.221	
tourism	-1.237	0.348	***	-2.155	0.731	***	-0.866	0.297	***	-1.272	0.328	***
tenure	0.004	0.003		0.007	0.007		0.011	0.003	***	0.008	0.003	***
wage	0.002	0.002		-0.012	0.010		0.001	0.001		0.001	0.001	
part-time	-0.246	0.312		-0.260	0.753		-0.019	0.257		-0.413	0.323	
illness	-0.005	0.173		-0.092	0.302		-0.277	0.223		-0.215	0.256	
duration	0.017	0.004	***	0.016	0.007	**	0.021	0.004	***	0.005	0.005	
one AC prev.exp.	-0.086	0.149		0.362	0.217	*	0.120	0.153		0.095	0.172	
two AC	0.415	0.172	**	0.170	0.341		0.468	0.189	**	0.363	0.214	*
three or more AC	-0.091	0.211		0.760	0.351	**	0.021	0.238		0.477	0.245	**
employment growth	-0.084	0.082		0.119	0.116		0.124	0.109		0.303	0.126	**
constant	-19.329	2.710	***	0.953	3.750		-17.534	2.425	***	-9.609	2.615	***
Log-likelihood	-1677.75						-1940.57					
Pseudo R2	0.113						0.083					
Observed transition rates	7.31%			2.49%			5.41%			4.08%		
Predicted transition rates	4.32%			1.75%			3.86%			3.85%		

Source: my elaboration on WHIP data

Table 11. Marginal effects (Standard MNL model)

	PRE REFORM		POST REFORM	
covariates	PC vs NW	AC vs NW	PC vs NW	AC vs NW
age	0.05553	-0.00656	0.04038	0.01779
age square	-0.00111	0.00009	-0.00078	-0.00040
male	0.01166	0.00425	0.01007	-0.00332
north-west	0.01834	0.00492	0.02489	0.01601
north-east	0.01390	0.00366	0.01792	0.02161
south-islands	-0.05072	-0.01513	-0.02101	-0.01352
blue collar	0.01700	0.00962	0.00560	0.00005
white collar	0.01799	0.00051	0.00780	0.01917
buildings	-0.00735	0.00280	-0.01707	-0.00830
tourism	-0.03421	-0.01954	-0.02379	-0.03184
tenure	0.00016	0.00012	0.00041	0.00029
wage	0.00009	-0.00021	0.00002	0.00005
part-time	-0.00904	-0.00385	-0.00017	-0.01300
illness	-0.00016	-0.00153	-0.00902	-0.00703
duration	0.00070	0.00026	0.00076	0.00015
one AC prev.exp.	-0.00376	0.00692	0.00442	0.00342
two AC	0.01978	0.00270	0.01985	0.01430
three or more AC	-0.00439	0.01817	-0.00010	0.02134
employment growth	-0.00356	0.00211	0.00415	0.01105

Source: my elaboration on WHIP data

Table 12. Random-Effects MNL model estimates

	PRE RIFORMA						POST RIFORMA					
	PC vs NW			AC vs NW			PC vs NW			AC vs NW		
covariates	b	s.e		b	s.e		b	s.e		b	s.e	
age	1.465	0.278	***	-0.226	0.373		1.154	0.217	***	0.580	0.216	***
age square	-0.029	0.006	****	0.002	0.008		-0.022	0.004	***	-0.013	0.005	***
male	0.325	0.151	**	0.324	0.242		0.278	0.146	*	-0.066	0.157	
north-west	0.472	0.188	**	0.343	0.310		0.658	0.234	***	0.477	0.263	*
north-east	0.374	0.194	*	0.261	0.312		0.524	0.233	**	0.617	0.255	**
south-islands	-2.116	0.374	***	-1.440	0.543	***	-0.720	0.310	**	-0.460	0.339	
blue collar	0.402	0.210	*	0.565	0.338	*	0.152	0.189		0.009	0.218	
white collar	0.381	0.265		0.038	0.611		0.235	0.227		0.466	0.252	*
buildings	-0.199	0.185		0.153	0.253		-0.578	0.230	**	-0.286	0.235	
tourism	-1.353	0.377	***	-2.220	0.733	***	-0.916	0.308	***	-1.335	0.343	***
tenure	0.004	0.003		0.007	0.007		0.012	0.003	***	0.009	0.004	**
wage	0.002	0.002		-0.014	0.009		0.001	0.001		0.002	0.001	
part-time	-0.253	0.342		-0.265	0.759		-0.015	0.266		-0.417	0.341	
illness	0.001	0.189		-0.114	0.325		-0.278	0.224		-0.225	0.264	
duration	0.019	0.005	***	0.016	0.009	*	0.022	0.005	***	0.006	0.006	
one AC prev.exp.	-0.078	0.162		0.366	0.237		0.115	0.160		0.083	0.179	
two AC	0.450	0.194	**	0.145	0.351		0.480	0.199	**	0.368	0.227	
three or more AC	-0.103	0.234		0.677	0.350	*	0.024	0.245		0.477	0.251	*
employment growth	-0.094	0.092		0.109	0.140		0.133	0.113		0.312	0.129	**
constant	-21.323	3.311	***	-0.746	4.016		-18.346	2.685	***	-10.660	2.454	***
Log likelihood			-1672.16						-1938.06			
variance	1.015	0.683		1.251	0.568		0.547	0.680		0.817	0.037	
					s.e.						s.e.	
covariance		1.127			0.489			0.668			0.416	
correlation			1.00						0.99			

Source: my elaboration on WHIP data

Table 13a. Observed transition rates by number of previous AC experiences

Number of previous	PRE REFORM			POST REFORM		
AC experiences	NW	PC	AC	NW	PC	AC
zero	91.52%	6.41%	2.06%	91.18%	4.93%	3.89%
one	89.93%	6.96%	3.10%	89.24%	6.10%	4.66%
two	85.08%	12.52%	2.39%	84.67%	9.09%	6.24%
three or more	85.98%	9.43%	4.60%	85.30%	6.99%	7.71%

Source: my elaboration on WHIP data

Table 13b. Observed transition rates by area, gender and qualification

	PRE REFORM			POST REFORM		
	NW	PC	AC	NW	PC	AC
			Area			
North-west	86.45%	10.35%	3.20%	86.79%	8.07%	5.15%
North-east	88.54%	8.18%	3.27%	88.07%	6.11%	5.82%
Centre	90.18%	7.74%	2.08%	91.90%	4.60%	3.49%
South-islands	98.13%	1.28%	0.58%	95.71%	2.30%	1.99%
			Gender			
Female	92.02%	6.11%	1.87%	89.85%	5.18%	4.96%
Male	88.94%	8.15%	2.92%	89.38%	6.17%	4.45%
			Qualification			
Apprentice	92.67%	4.46%	2.88%	91.83%	3.97%	4.20%
Blue-collar	84.74%	12.91%	2.35%	86.32%	9.04%	4.64%
White-collar	86.17%	12.84%	0.99%	83.31%	9.68%	7.01%

Source: my elaboration on WHIP data

Table 14. Tests

Likelihood ratio tests

Model A: restricted model
Model B: less restrictred model
Model C: unrestricted model

	LR chi2	df	Prob. > chi2
Model A vs Model B	19.66	2	0.000
Model B vs Model C	66.13	40	0.006

Chow test

H0: stability of parameters

Transition toward	chi2	df	Prob. > chi2
PC	23.19	18	0.183
AC	42.59	18	0.000

Hausman test of IIA assumption

H0: Odds(Outcome-J vs Outcome-K) are independent of other alternatives

omitted	chi2	df	Prob.> chi2	evidence
PC	0.223	37	1.000	for H0
AC	0.248	38	1.000	for H0

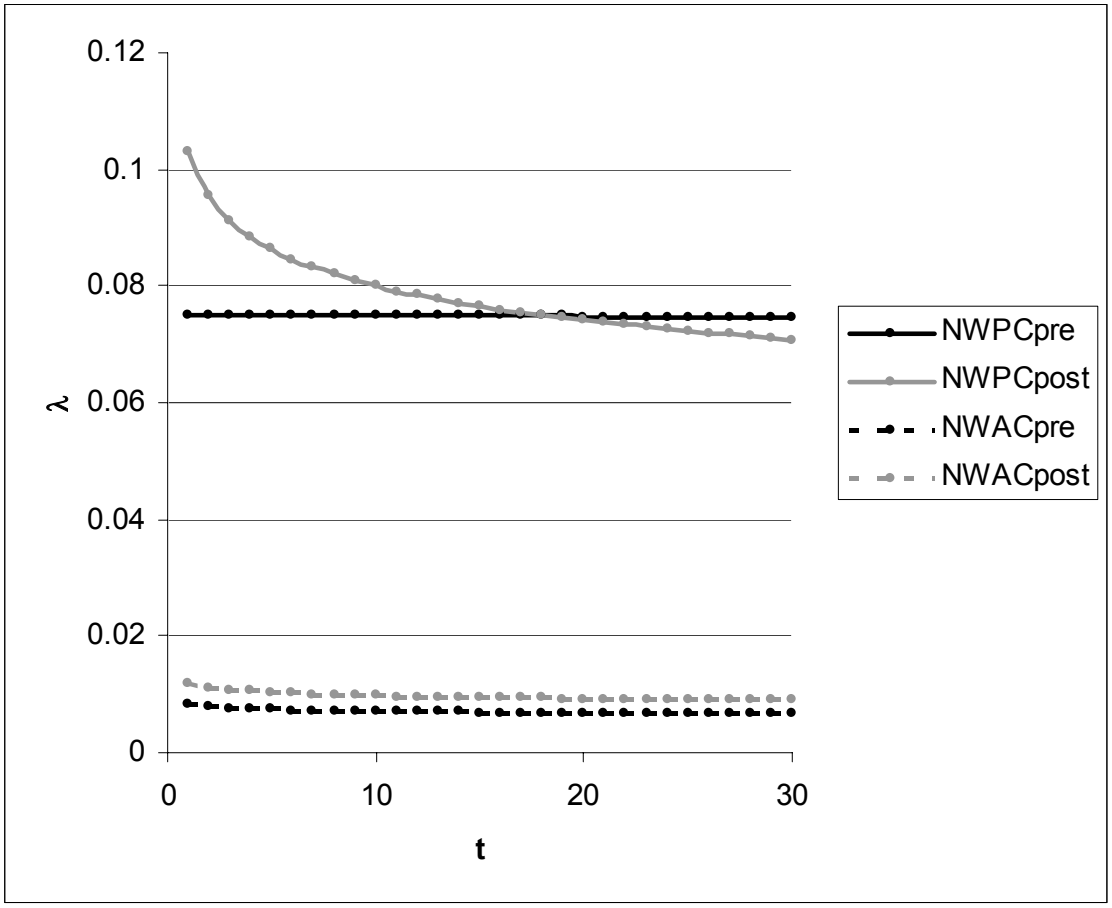
Small-Hsiao tests of IIA assumption

H0: Odds(Outcome-J vs Outcome-K) are independent of other alternatives

omitted	lnL(full)	lnL(omit)	chi2	df	Prob.> chi2	evidence
PC	-722.94	-704.88	36.13	40	0.645	for H0
AC	-1029.85	-1006.70	46.31	40	0.228	for H0

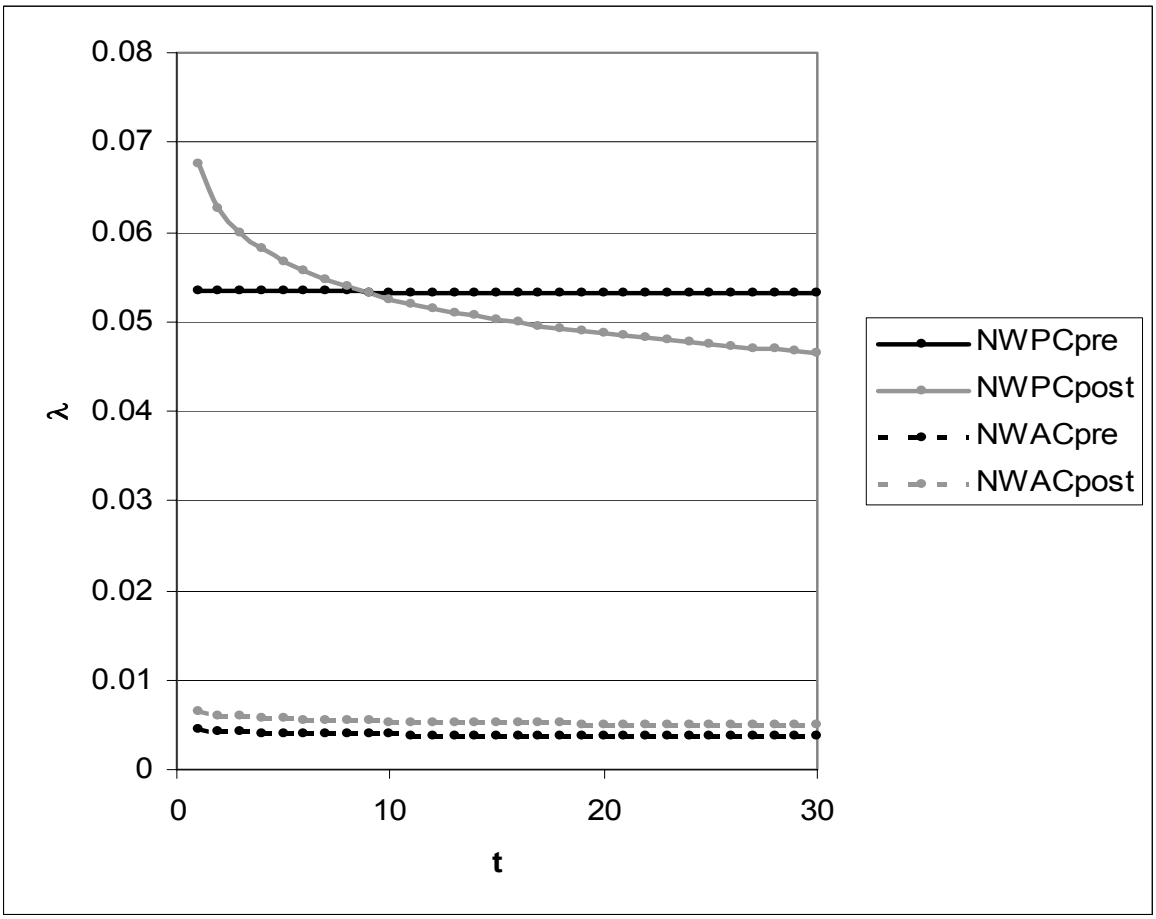
Source: my elaboration on WHIP data

Figure 1. Monthly predicted Hazard rate: leaving a NW (North-West)



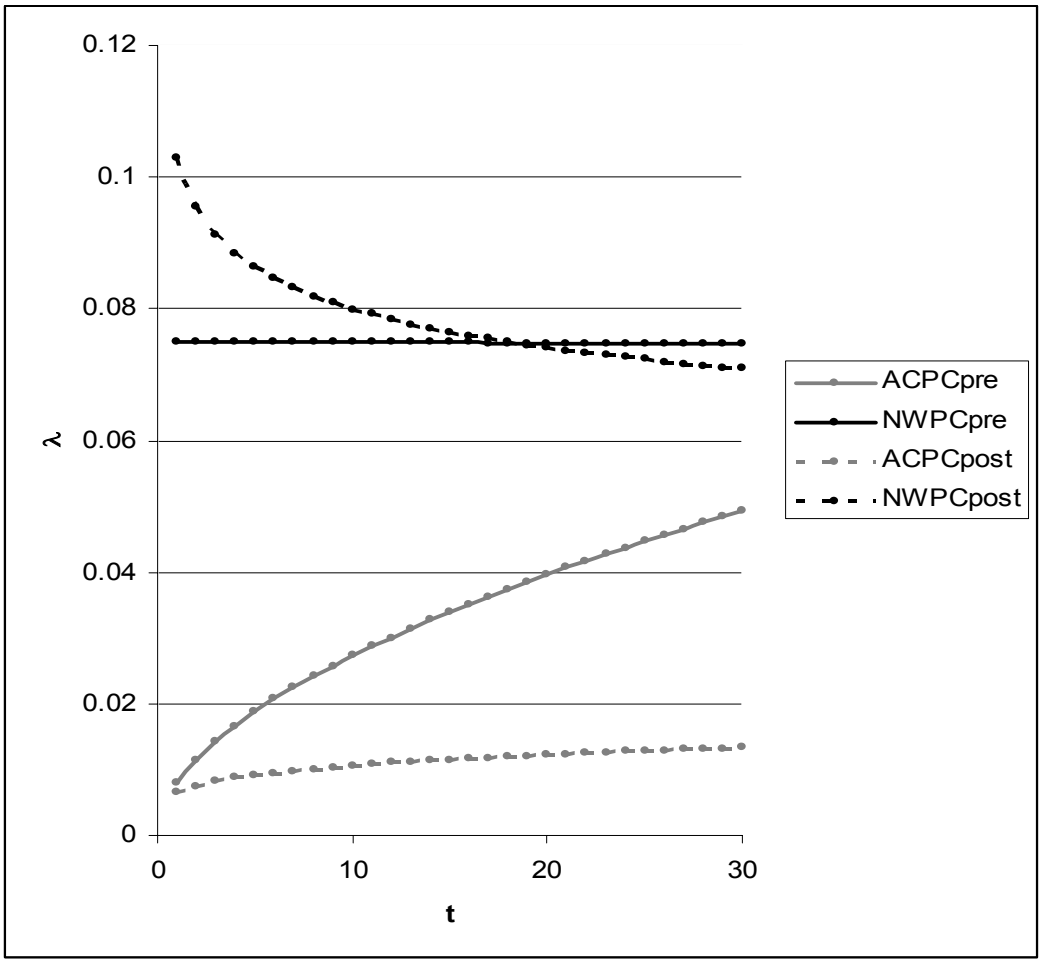
Reference category: 25 years old, male, low skills, no buildings, no tourism, no part-time, wage: 50 euro per day, tenure: 20 months, no AC previous experiences, first contract: PC, employment growth: 0.6%.
Source: my elaboration on WHIP dataset

Figure 2. Monthly predicted Hazard rate: leaving a NW (South-Islands)



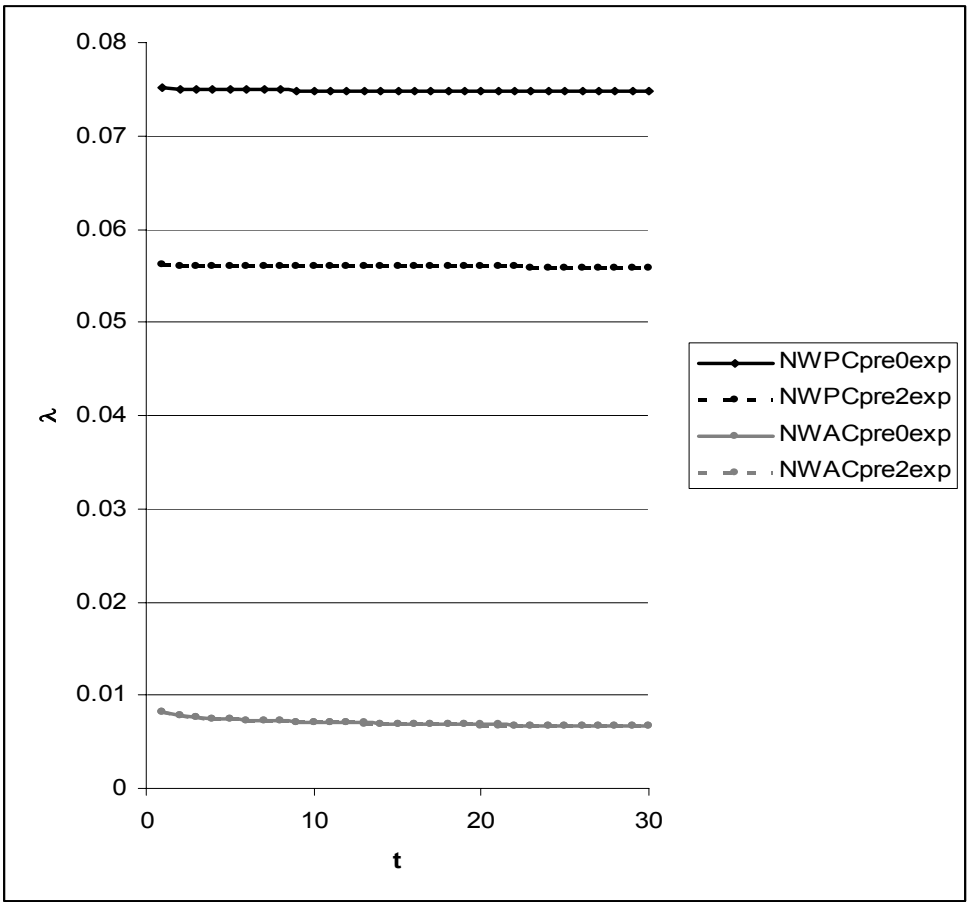
Reference category: 25 years old, male, low skills, no buildings, no tourism, no part-time, wage: 50 euro per day, tenure: 20 months, no AC previous experiences, first contract: PC, employment growth: 0.6%.
Source: my elaboration on WHIP dataset

Figure 3. Monthly predicted Hazard rate: reaching a PC (North-West)



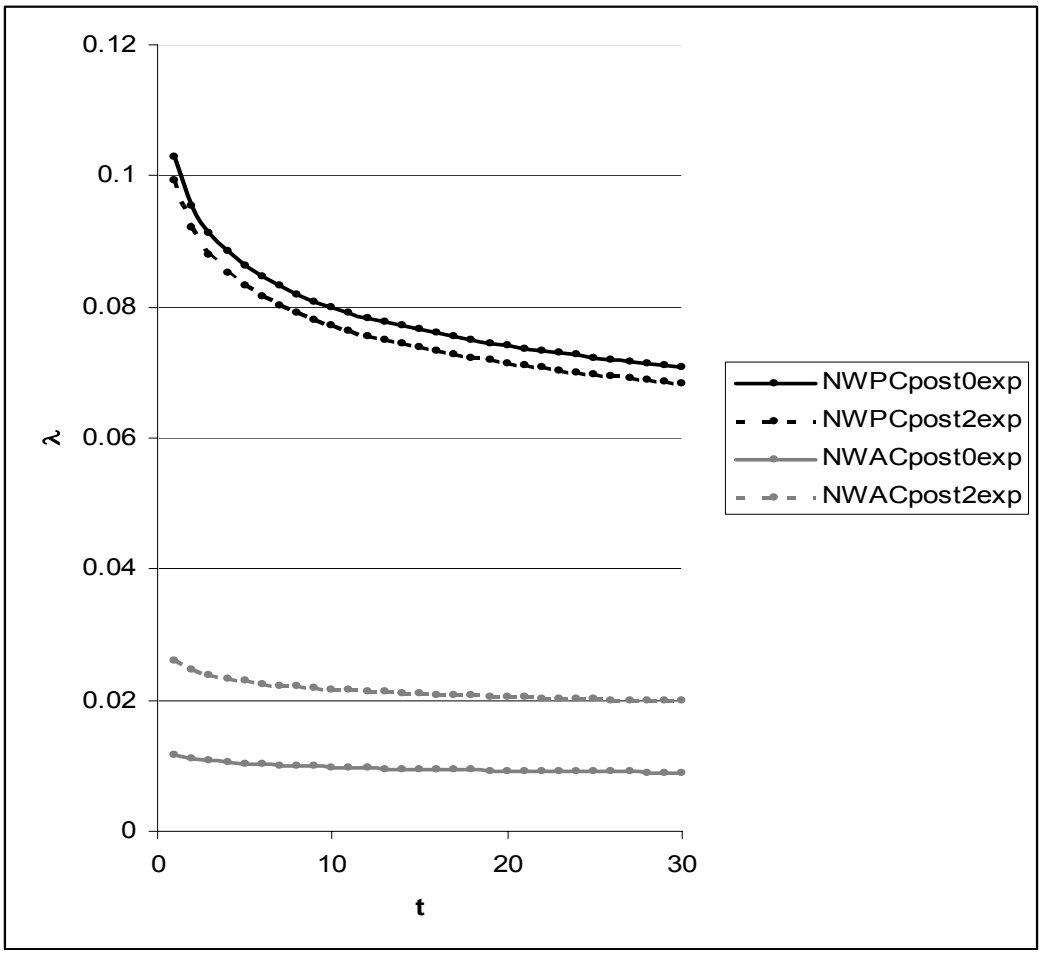
Reference category: 25 years old, male, low skills, no buildings, no tourism, no part-time, wage: 50 euro per day, tenure: 20 months, no AC previous experiences, first contract: PC, employment growth: 0.6%.
Source: my elaboration on WHIP dataset

Figure 4. Monthly predicted Hazard rate: NW transitions out by number of previous AC experiences (North-West, Pre-reform)



Reference category: 25 years old, male, low skills, no buildings, no tourism, no part-time, wage: 50 euro per day, tenure: 20 months, first contract: PC, employment growth: 0.6%.
Source: my elaboration on WHIP dataset

Figure 5. Monthly predicted Hazard rate: NW transitions out by number of previous AC experiences (North-West, Post-reform)



Reference category: 25 years old, male, low skills, no buildings, no tourism, no part-time, wage: 50 euro per day, tenure: 20 months, first contract: PC, employment growth: 0.6%.
Source: my elaboration on WHIP dataset